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

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Summary

In December 2016, the Navy released a force-structure goal that calls 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 Trump Administration has identified the achievement of a Navy of 355 or more ships within 10 years as a high priority. The Navy states that it is working as well as it can, within a Navy budget top line that is essentially flat in real (i.e., inflation-adjusted terms), toward achieving that goal while also adequately funding other Navy priorities, such as restoring eroded ship readiness and improving fleet lethality. Navy officials state that while the 355-ship goal is a priority, they want to avoid creating a so-called hollow force, meaning a Navy that has an adequate number of ships but is unable to properly crew, arm, operate, and maintain those ships.

The Navy states that its proposed FY2021 budget requests the procurement of eight new ships, but this figure includes LPD-31, an LPD-17 Flight II amphibious ship that Congress procured (i.e., authorized and appropriated procurement funding for) in FY2020. Excluding this ship, the Navy's proposed FY2021 budget requests the procurement of seven new ships rather than eight.

A figure of 7 new ships is less than the 11 that the Navy requested for FY2020 (a figure that excludes CVN-81, an aircraft carrier that Congress authorized in FY2019) or the 13 that Congress procured in FY2020 (a figure that again excludes CVN-81, but includes the above-mentioned LPD-31 as well as an LHA amphibious assault ship that Congress also procured in FY2020). The figure of 7 new ships is also less than the 10 ships that the Navy projected under its FY2020 budget submission that it would request for FY2021, and less than the average ship procurement rate that would be needed over the long run, given current ship service lives, to achieve and maintain a 355-ship fleet.

In dollar terms, the Navy is requesting a total of about $19.9 billion for its shipbuilding account for FY2021. This is about $3.9 billion (16.3%) less than the Navy requested for the account for FY2020, about $4.1 billion (17.0%) less than Congress provided for the account for FY2020, and about $3.6 billion (15.3%) less than the $23.5 billion that the Navy projected under its FY2020 budget submission that it would request for the account for FY2021.

The Navy states that its FY2021 five-year (FY2021-FY2025) shipbuilding plan includes 44 new ships, but this figure includes the above-mentioned LPD-31 and LHA amphibious ships that Congress procured in FY2020. Excluding these two ships, the Navy's FY2021 five-year shipbuilding plan includes 42 new ships, which is 13 less than the 55 that were included in the FY2020 (FY2020-FY2024) five-year plan and 12 less than the 54 that were projected for the period FY2021-FY2025 under the Navy's FY2020 30-year shipbuilding plan.

The Navy's 355-ship force-level goal is the result of a Force Structure Assessment (FSA) conducted by the Navy in 2016. A new FSA, referred to as the Integrated Naval FSA (INFSA), is to be published sometime during the spring of 2020. Statements from Department of the Navy (DON) officials suggest that the INFSA could result in a once-in-a-generation change in the Navy's fleet architecture, meaning the mix of ships that make up the Navy. DON officials suggest that the INFSA could shift the fleet to a more distributed architecture that includes a reduced proportion of larger ships, an increased proportion of smaller ships, and a newly created category of large unmanned surface vehicles (USVs) and large unmanned underwater vehicles (UUVs). Such a change in fleet architecture could alter the mix of ships to be procured for the Navy and the distribution of Navy shipbuilding work among the nation's shipyards.

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Introduction

This report presents background information and issues for Congress concerning the Navy's force structure and shipbuilding plans. The current and planned size and composition of the Navy, the annual rate of Navy ship procurement, the capacity of the naval shipbuilding industry, and the prospective affordability of the Navy's shipbuilding plans have been oversight matters for the congressional defense committees for many years.

The Navy states that its proposed FY2021 budget requests the procurement of eight new ships, but this figure includes LPD-31, an LPD-17 Flight II amphibious ship that Congress procured (i.e., authorized and appropriated procurement funding for) in FY2020. Excluding this ship, the Navy's proposed FY2021 budget requests the procurement of seven new ships rather than eight, including one Columbia-class ballistic missile submarine (SSBN), one Virginia-class attack submarine (SSN), two DDG-51 destroyers, one FFG(X) frigate, and two TATS towing, salvage, and rescue ships.

The issue for Congress is whether to approve, reject, or modify the Navy's proposed FY2021 shipbuilding program and the Navy's longer-term shipbuilding plans. Decisions that Congress makes on this issue can substantially affect Navy capabilities and funding requirements, and the U.S. shipbuilding industrial base.

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 (SSN-774) Class Attack Submarine Procurement: 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. (This report also covers the issue of the Administration's FY2020 budget proposal, which the Administration withdrew on April 30, to not fund a mid-life refueling overhaul [called a refueling complex overhaul, or RCOH] for the aircraft carrier *Harry S. Truman* [CVN-75], and to retire CVN-75 around FY2024.)
- CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R44972, *Navy Frigate (FFG[X]) 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 R43546, *Navy John Lewis (TAO-205) Class Oiler 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.

For a discussion of the strategic and budgetary context in which U.S. Navy force structure and shipbuilding plans may be considered, see **Appendix A**.

Background

Navy's 355-Ship Ship Force-Structure Goal

Introduction

On December 15, 2016, the Navy released a force-structure goal that calls for achieving and maintaining a fleet of 355 ships of certain types and numbers.[1] The force level of 355 ships is a goal to be attained in the future; the actual size of the Navy in recent years has generally been between 270 and 300 ships. **Table 1** shows the composition of the 355-ship force-level objective.

Table 1. 355-Ship Force-Level Goal

Ship Category	Number of ships
Ballistic missile submarines (SSBNs)	12
Attack submarines (SSNs)	66
Aircraft carriers (CVNs)	12
Large surface combatants (i.e., cruisers [CGs] and destroyers [DDGs])	104
Small surface combatants (i.e., frigates [FFGs], Littoral Combat Ships, and mine warfare ships)	52
Amphibious ships	38
Combat Logistics Force (CLF) ships (i.e., at-sea resupply ships)	32
Command and support ships	39
TOTAL	**355**

Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, Table A-1 on page 10.

355-Ship Goal Resulted from 2016 Force Structure Assessment (FSA)

The 355-ship force-level goal is the result of a Force Structure Assessment (FSA) conducted by the Navy in 2016. An FSA is an analysis in which 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.[2]

Although the result of the FSA is often reduced for convenience to single number (e.g., 355 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. The Navy conducts a new FSA or an update to the existing FSA every few years, as circumstances require, to determine its force-structure goal.

[1] For previous Navy force-level goals, see **Appendix B**.

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

355-Ship Goal Made U.S. Policy by FY2018 NDAA

Section 1025 of the FY2018 National Defense Authorization Act, or NDAA (H.R. 2810/P.L. 115-91 of December 12, 2017), states the following:

> 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.

The term *battle force ships* in the above provision refers to the ships that count toward the quoted size of the Navy in public policy discussions about the Navy.[3]

355-Ship Goal Is an Administration Priority

The Trump Administration has identified the achievement of a Navy of 355 or more ships within 10 years as a high priority. The Navy states that it is working as well as it can, within a Navy budget top line that is essentially flat in real (i.e., inflation-adjusted terms), toward achieving that goal while also adequately funding other Navy priorities, such as restoring eroded ship readiness and improving fleet lethality. Navy officials state that while the 355-ship goal is a priority, they want to avoid creating a so-called hollow force, meaning a Navy that has an adequate number of ships but is unable to properly crew, arm, operate, and maintain those ships.

Large Unmanned Vehicles and Navy Ship Count

Because large unmanned surface and underwater vehicles now being developed by the Navy could be deployed directly from pier (rather than from a manned Navy ship) to perform missions that might otherwise be assigned to manned ships and submarines, some observers raised a question as to whether the large UVs unmanned surface and underwater vehicles should be included in the top-level count of the number of ships in the Navy.

In December 2019, it was reported that the Office of Management and Budget (OMB) had directed the Navy to include in its FY2021 budget submission a legislative proposal to formally change the definition of which ships count toward the quoted size of the Navy (known as the number of battle force ships) to include not only manned ships, but also large UVs that operate essentially as unmanned ships.[4] In January 2020, however, Admiral Michael Gilday, the Chief of Naval Operations, stated that the top-level expression of the ship force-level goal resulting from the Navy's next FSA (discussed later in this report), will not include UVs.[5]

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[3] 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).

[4] See Justin Katz, "OMB: Pentagon Must Submit Proposal to 'Redefine' Battleforce Ships to Include Unmanned Vehicles," *Inside Defense*, December 20, 2019; Joseph Trevithick, "White House Asks Navy To Include New Unmanned Vessels In Its Ambitious 355 Ship Fleet Plan," *The Drive*, December 20, 2019; Paul McCleary, "Navy To Slash 24 Ships in 2021 Plan, Bolster Unmanned Effort," *Breaking Defense*, December 20, 2019, David B. Larter, "Pentagon Proposes Big Cuts to US Navy Destroyer Construction, Retiring 13 Cruisers," *Defense News*, December 24, 2019.

[5] See, for example, Sam LaGrone, "CNO Gilday Calls for Budget Increase to Reach 355 Ship Fleet; New Battle Force

Navy's FY2021, Five-Year, and 30-Year Shipbuilding Plans

Treatment of Procurement Dates of CVN-81, LPD-31, and LHA-9

The Navy's FY2021 budget submission presents the aircraft carrier CVN-81 as a ship that Congress procured in FY2020. Consistent with congressional action on the Navy's FY2019 budget regarding the procurement of CVN-81, this CRS report treats CVN-81 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2019. Discussion in this CRS report of the Navy's FY2021 budget submission is adjusted to show CVN-81 as a ship that was procured in FY2019.

The Navy's FY2021 budget submission presents LPD-31, an LPD-17 Flight II amphibious ship, as a ship requested for procurement in FY2021, and the amphibious assault ship LHA-9 as a ship projected for procurement in FY2023. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LPD-31 and LHA-9, this CRS report treats LPD-31 and LHA-9 as ships that Congress procured (i.e., authorized and provided procurement funding for) in FY2020. Discussion in this CRS report of the Navy's FY2021 budget submission is adjusted to show LPD-31 and LHA-9 as ships that were procured in FY2020.

For additional discussion regarding the treatment in this report of the procurement dates of CVN-81, LPD-31, and LHA-9, see **Appendix I**.

FY2021 Shipbuilding Request

The Navy states that its proposed FY2021 budget requests the procurement of eight new ships, but this figure includes LPD-31, an LPD-17 Flight II amphibious ship that Congress procured (i.e., authorized and appropriated procurement funding for) in FY2020 (see previous section.) Excluding this ship, the Navy's proposed FY2021 budget requests the procurement of seven new ships rather than eight, including

- one Columbia-class ballistic missile submarine (SSBN),
- one Virginia-class attack submarine (SSN),
- two DDG-51 destroyers,
- one FFG(X) frigate, and
- two TATS towing, salvage, and rescue ships.

A figure of seven new ships is less than:

- the 11 ships that the Navy requested for FY2020 (a figure that excludes CVN-81, an aircraft carrier that Congress authorized in FY2019);
- the 13 ships that Congress procured in FY2020 (a figure that again excludes CVN-81, but includes the above-mentioned LPD-17 Flight II amphibious ship as well as an LHA amphibious assault ship that Congress also procured in FY2020);
- the 10 ships that the Navy projected under its FY2020 budget submission that it would request for FY2021; and

Count Won't Include Unmanned Ships," *USNI News*, January 14, 2020; Rich Abott, "CNO: Ship Count Will Not Include Unmanned; Bigger Topline Needed For Fleet Goal," *Defense Daily*, January 15, 2020; John M. Doyle, "CNO Wants Larger Slice of Defense Budget to Modernize, Meet China Threat," *Seapower*, January 15, 2020; Rich Abott, "CNO: Ship Count Will Not Include Unmanned; Bigger Topline Needed For Fleet Goal," *Defense Daily*, January 15, 2020.

- the average ship procurement rate that would be needed over the long run, given current ship service lives, to achieve and maintain a 355-ship fleet.

In dollar terms, the Navy is requesting a total of about $19.9 billion for its shipbuilding account for FY2021. This is about

- $3.9 billion (16.3%) less than the Navy requested for the account for FY2020;
- $4.1 billion (17.0%) less than Congress provided for the account for FY2020; and
- $3.6 billion (15.3%) less than the $23.5 billion that the Navy projected under its FY2020 budget submission that it would request for the account for FY2021.

FY2021 Five-Year (FY2021-FY2025) Shipbuilding Plan

The Navy states that its FY2021 five-year (FY2021-FY2025) shipbuilding plan (**Table 2**) includes 44 new ships, but this figure includes the above-mentioned LPD-31 and LHA amphibious ships that Congress procured in FY2020. Excluding these two ships, the Navy's FY2021 five-year shipbuilding plan includes 42 new ships, which is

- 13 ships less than the 55 that were included in the FY2020 (FY2020-FY2024) five-year plan, and
- 12 ships less than the 54 that were projected for the period FY2021-FY2025 under the Navy's FY2020 30-year shipbuilding plan.

Table 2 also shows, for reference purposes, the ships funded for procurement in FY2020.

Table 2. FY2021 Five-Year (FY2021-FY2025) Shipbuilding Plan

FY2019 shown for reference

	FY20 (enacted)	FY21 (req.)	FY22	FY23	FY24	FY25	FY21-FY25 Total
Columbia (SSBN-826) class ballistic missile submarine							
Gerald R. Ford (CVN-78) class aircraft carrier	*[a]*	1			1		2
Virginia (SSN-774) class attack submarine	*2*	1	2	2	2	2	9
Arleigh Burke (DDG-51) class destroyer	*3*	2	2	1	2	1	8
FFG(X) frigate	*1*	1	1	2	2	3	9
LHA amphibious assault ship	*1 [b]*			[b]			
LPD-17 Fight II amphibious ship	*1 [b]*	[b]		1		1	2
Expeditionary Fast Transport (EPF) ship	*1*						
Submarine tender (AS[X])					1		1
John Lewis (TAO-205) class oiler	*2*			1	2	1	4
TATS towing, salvage, and rescue ship	*2*	2	1				3
TAGOS(X) ocean surveillance ship			1	1	1	1	4
TOTAL	***13***	**7**	**7**	**8**	**11**	**9**	**42**

Source: Table prepared by CRS based on FY2021 Navy budget submission, with adjustments as noted below.

Notes: [a] The Navy's FY2021 budget submission presents the aircraft carrier CVN-81 as a ship that Congress procured in FY2020. Consistent with congressional action on the Navy's FY2019 budget regarding the procurement of CVN-81, this CRS report treats CVN-81 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2019. For additional discussion, see **Appendix I**. [b] The Navy's FY2021 budget submission presents LPD-31, an LPD-17 Flight II amphibious ship, as a ship requested for

procurement in FY2021, and the amphibious assault ship LHA-9 as a ship projected for procurement in FY2023. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LPD-31 and LHA-9, this CRS report treats LPD-31 and LHA-9 as ships that Congress procured (i.e., authorized and provided procurement funding for) in FY2020. For additional discussion, see **Appendix I**.

The Navy has not yet submitted its FY2021 30-year (FY2021-FY2050) shipbuilding plan. As a placeholder pending the submission of that plan, **Table 3** shows the Navy's FY2020 30-year (FY2020-FY2049) 30-year shipbuilding plan. As shown in **Table 3**, the Navy's FY2020 30-year shipbuilding plan included 304 new ships, or an average of about 10 per year.

In devising a 30-year shipbuilding plan to move the Navy toward its ship force-structure goal, key assumptions and planning factors include but are not limited to ship construction times and service lives, estimated ship procurement costs, projected shipbuilding funding levels, and industrial-base considerations.

Table 3. FY2020 30-Year (FY2020-FY2049) Shipbuilding Plan

FY	CVNs	LSCs	SSCs	SSNs	LPSs	SSBNs	AWSs	CLFs	Supt	Total
20	1	3	1	3				2	2	**12**
21		2	2	2		1	1	1	1	**10**
22		2	2	2				1	2	**9**
23		3	2	2			1	2	3	**13**
24		3	2	2		1	1	1	1	**11**
25		3	2	2			1	1	2	**11**
26		2	2	2		1	1	1	2	**11**
27		3	2	2		1	2	1	1	**12**
28	1	2	2	2		1	1	1	1	**11**
29		3	2	2		1	1	1	1	**11**
30		2	1	2		1	1	1	2	**10**
31		3	2	2		1	2	1	2	**13**
32	1	2	2	2		1	1	1	2	**12**
33		3	2	2		1	1	1	2	**12**
34		2	2	2		1	2		2	**11**
35		3	2	2		1			1	**9**
36	1	2	2	2	1					**8**
37		3	2	2						**7**
38		2	2	2			1			**7**
39		3	2	2	1					**8**
40	1	2	2	2			1			**8**
41		3	2	2			1			**8**
42		2	2	2	1		1			**8**
43		3	2	2				1		**8**
44	1	2	2	2			1			**8**
45		3	2	2	1		2	2		**12**
46		2	2	2			1	2		**9**
47		3	2	2			1	2		**10**
48	1	2	2	2	1		2	2		**12**
49		3	2	2			1	2	3	**13**
Total	7	76	58	61	5	12	28	27	30	**304**

Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, Table A2-1 on page 13.

Key: FY = Fiscal Year; **CVNs** = aircraft carriers; **LSCs** = surface combatants (i.e., cruisers and destroyers); **SSCs** = small surface combatants (i.e., Littoral Combat Ships [LCSs] and frigates [FFG(X)s]); **SSNs** = attack submarines; **LPSs** = large payload submarines; **SSBNs** = ballistic missile submarines; **AWSs** = amphibious warfare ships; **CLFs** = combat logistics force (i.e., resupply) ships; **Supt** = support ships.

Projected Force Levels Under FY2020 30-Year Shipbuilding Plan

The Navy has not yet submitted its FY2021 30-year (FY2021-FY2050) shipbuilding plan. As a placeholder pending the submission of that plan, **Table 4** shows the Navy's projection of ship force levels for FY2020-FY2049 that would result from implementing the FY2020 30-year (FY2020-FY2049) 30-year shipbuilding plan shown in **Table 3**.

Table 4. Projected Force Levels Resulting from FY2020 30-Year Shipbuilding Plan

	CVNs	LSCs	SSCs	SSNs	SSGN/LPSs	SSBNs	AWSs	CLFs	Supt	Total
355-ship goal	**12**	**104**	**52**	**66**	**0**	**12**	**38**	**32**	**39**	**355**
FY20	11	94	30	52	4	14	33	29	34	**301**
FY21	11	92	33	53	4	14	34	30	34	**305**
FY22	11	93	33	52	4	14	34	31	39	**311**
FY23	11	95	32	51	4	14	35	31	41	**314**
FY24	11	94	35	47	4	14	36	32	41	**314**
FY25	10	95	35	44	4	14	37	32	42	**313**
FY26	10	96	36	44	2	14	38	31	43	**314**
FY27	9	100	38	42	1	13	37	32	44	**316**
FY28	10	102	41	42		13	38	32	44	**322**
FY29	10	104	43	44		12	36	32	44	**325**
FY30	10	107	45	46		11	36	32	44	**331**
FY31	10	110	47	48		11	36	32	43	**337**
FY32	10	112	49	49		11	36	32	44	**343**
FY33	10	115	50	51		11	38	32	44	**351**
FY34	10	117	52	53		11	36	32	44	**355**
FY35	10	114	55	54		11	34	32	45	**355**
FY36	10	109	57	56		11	35	32	45	**355**
FY37	10	107	58	58		10	35	32	45	**355**
FY38	10	108	59	57		10	35	32	44	**355**
FY39	10	105	61	58		10	37	32	42	**355**
FY40	9	105	62	59		10	37	32	41	**355**
FY41	10	104	61	59		11	37	32	41	**355**
FY42	9	106	60	61		12	36	32	39	**355**
FY43	9	108	57	61	1	12	36	32	39	**355**
FY44	9	109	55	62	1	12	36	32	39	**355**
FY45	10	107	55	63	1	12	36	32	39	**355**
FY46	9	106	54	64	2	12	37	32	39	**355**
FY47	9	107	54	65	2	12	35	32	39	**355**
FY48	9	109	51	66	2	12	35	32	39	**355**
FY49	10	108	50	67	3	12	35	31	39	**355**

Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, Table A2-4 on page 13.

Note: Figures for support ships include five JHSVs transferred from the Army to the Navy and operated by the Navy primarily for the performance of Army missions.
Key: FY = Fiscal Year; **CVNs** = aircraft carriers; **LSCs** = surface combatants (i.e., cruisers and destroyers); **SSCs** = small surface combatants (i.e., frigates, Littoral Combat Ships [LCSs], and mine warfare ships); **SSNs** = attack submarines; **SSGNs/LPSs** = cruise missile submarines/large payload submarines; **SSBNs** = ballistic missile submarines; **AWSs** = amphibious warfare ships; **CLFs** = combat logistics force (i.e., resupply) ships; **Supt** = support ships.

New FSA To Replace 355-Ship Goal; Could Alter Distribution of Shipbuilding Work

New FSA Is Called an Integrated FSA (INFSA)

A new FSA—referred to as the Integrated Naval FSA (INFSA), with the term naval referring to both the Navy and Marine Corps (i.e., the two naval services)—is now underway as the successor to the 2016 FSA.[6] Department of the Navy (DON) officials have stated that they are referring to the new FSA as an integrated naval FSA to emphasize that it will integrate Marine Corps requirements into the FSA process more fully than previous FSAs. DON officials state that the INFSA will take into account the Trump Administration's December 2017 National Security Strategy document and its January 2018 National Defense Strategy document, both of which put an emphasis on renewed great power competition with China and Russia,[7] as well as updated information on Chinese and Russian naval and other military capabilities and recent developments in new technologies, including those related to unmanned vehicles (UVs).[8]

INFSA to Be Released This Year, Perhaps During Spring of 2020

Through much of 2019, Navy officials stated that the INFSA was to be completed by the end of 2019. A September 27, 2019, press report stated that an interim version was to be completed by September 2019, in time to inform programmatic decisions on the FY2022 Program Objective Memorandum (POM), meaning the in-house DOD planning document that will guide the development of DOD's FY2022 budget submission.[9] A December 6, 2019, memorandum from

[6] A September 27, 2019, press report stated that on September 6, 2019, the Chief of Naval Operations and the Commandant of the Marine Corps signed a memorandum stating that the two services will develop a "comprehensive naval force architecture" to inform the new FSA, and that the new FSA will be developed as an integrated naval (i.e., Navy-Marine Corps) FSA (INFSA). (Mallory Shelbourne, "Navy, Marine Corps Conducting Integrated Force-Structure Assessment," *Inside Defense*, September 27, 2019. See also Otto Kreisher, "New Force Structure Assessment Will Address Needs of 'Great Power Competition,' Two Top Requirements Officers Say," *Seapower*, October 22, 2019, and the section under the subheader "Naval Integrated Force Structure Assessment" in Megan Eckstein, "Navy Marines Wargaming New Gear to Support Emerging Warfare Concepts," *USNI News*, October 23, 2019.)

[7] For additional discussion of the defense implications of great power competition, see CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

[8] See, for example, Marcus Weisgerber, "US Navy Re-Evaluating 355-Ship Goal," *Defense One*, February 1, 2019; Paul McLeary, "Navy Rethinks 355-Ship Fleet: CNO Richardson," *Breaking Defense*, February 1, 2019; Mallory Shelbourne, "CNO: Navy Expects New Force-Structure Assessment 'Later This Year,'" *Inside the Navy*, February 4, 2019.

[9] Mallory Shelbourne, "Navy, Marine Corps Conducting Integrated Force-Structure Assessment," *Inside Defense*, September 27, 2019. See also Otto Kreisher, "New Force Structure Assessment Will Address Needs of 'Great Power Competition,' Two Top Requirements Officers Say," *Seapower*, October 22, 2019, and the section under the subheader "Naval Integrated Force Structure Assessment" in Megan Eckstein, "Navy Marines Wargaming New Gear to Support

Acting Secretary of the Navy Thomas Modly stated that he expected the final INFSA to be published no later than January 15, 2020.[10] A January 23, 2020, press report quoted Modly as saying that the January 15 date was an internal Navy deadline, and that the Navy expects that the INFSA will be released to outside audiences sometime during the spring of 2020,[11] which would be well after the submission of the Navy's proposed FY2021 budget on February 10, 2020, and perhaps after the defense committees have completed most or all of their FY2021 budget-review hearings moved into markup on the FY2021 National Defense Authorization Act.

In his December 6, 2019, memorandum, Acting Secretary Modly stated that "my staff and I will become involved" in the INFSA, and that one of his five immediate objectives as acting secretary is to "establish an Integrated Plan to achieve a [fleet of] 355 (or more) ships, Unmanned Underwater Vehicles (UUVs), and Unmanned Surface Vehicles (USVs) for greater global naval power, within 10 years."

INFSA Could Call for a Navy of About 390 Manned Ships

Statements from Navy officials in the early months of 2020 suggest that the INFSA could result in a new Navy force-level goal for a fleet of about 390 manned ships plus about 45 unmanned or optionally manned ships, for a total of about 435 manned and unmanned or optionally manned ships. Navy officials have provided few additional details about the composition of this 390/435-ship force-level goal.[12] Navy officials have stated that the INFSA is being closely reviewed by the Secretary of Defense Mark Esper; it is possible that this review could lead to a change in the figures of 390 manned ships and 45 unmanned or optionally manned ships.[13]

INFSA Could Result in Once-in-a-Generation Change in Fleet Architecture and Distribution of Shipbuilding Work

Statements from DON officials suggest that the INFSA could result in a once-in-a-generation change in the Navy's fleet architecture, meaning the mix of ships that make up the Navy and how those ships are combined into formations and used to perform various missions. As detailed in the following sections of this report, statements from DON officials suggest that the INFSA could shift the fleet to a more distributed architecture that includes a reduced proportion of larger ships, an increased proportion of smaller ships, and a newly created category of large unmanned surface vehicles (USVs) and large unmanned underwater vehicles (UUVs). Such a change in fleet architecture could alter, perhaps substantially, the mix of ships to be procured for the Navy and

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Emerging Warfare Concepts," *USNI News*, October 23, 2019.

[10] Memorandum for distribution from Acting Secretary of the Navy Thomas B. Modly, subject "SecNav Vector !," dated December 6, 2019. See also David B. Larter, "Acting US Navy Secretary: Deliver Me a 355-Ship Fleet by 2030," *Defense News*, December 9, 2019.

[11] Mallory Shelbourne, "Modly: Navy Expects to Release FSA by Spring," *Inside Defense*, January 23, 2020.

[12] See, for example, Ben Werner, SECNAV Modly Says Nation Needs Larger, Distributed Fleet of 390 Hulls," USNI News, February 28, 2020; Mallory Shelbourne, "Modly Sketches Out Potential Navy Force Structure Changes, Anticipates 390-Ship Fleet," *Inside Defense*, February 28, 2020; Rich Abott, "Modly Reveals Next Force Structure Assessment Details, Working Toward 390-Ship Fleet," *Defense Daily*, February 28, 2020; Patrick Tucker, "Acting Navy Secretary: We Need More than 355 Ships, and That's Not Even Counting Robot Vessels," *Defense One*, February 28, 2020; Connor O'Brien, "Acting Navy Secretary Hints At Larger Fleet Goal," *Politico Pro*, February 28, 2020.

[13] See, for example, Paul McLeary, "Esper To Navy: Rethink Your Shipbuilding Plan," *Breaking Defense*, February 25, 2020; Paul McLeary, "EXCLUSIVE: SecDef Esper Seeks Détente With HASC; New Navy Plan This Summer," *Breaking Defense*, February 28, 2020; Paul Mcleary, "SecNav Details Gaps Between Navy & Pentagon Shipbuilding Plans," *Breaking Defense*, March 11, 2020; Megan Eckstein, "Modly: Parallel Fleet Studies Could Reshape Future of Aircraft Carriers," *USNI News*, March 12, 2020.

the distribution of Navy shipbuilding work among the nation's shipyards. A February 3, 2020, press report, for example, stated

> The Navy's plans to get to 355 manned ships by 2030 will rely on new classes of ships that don't exist yet—including new kinds of amphibious and supply ships as well as "lightly manned" ships—the acting Navy secretary told USNI News.
>
> The Force Structure Assessment that will lay out the Navy's path to this larger fleet, which leadership has described as "355-plus, plus unmanned," has been delayed and won't come out until after the Fiscal Year 2021 budget request is released next week. FY 2021 will put the Navy on a path to crest over 300 ships, Acting Secretary of the Navy Thomas Modly told USNI News in a phone interview, but the real growth will come in the FY 2022 request.
>
> Still, Modly previewed what the FSA might hold.
>
> "We haven't done a really comprehensive force structure assessment in a couple of years; 2016 was the last one. So we started on a new path for that last fall, and what we're finding in that force structure assessment is that the number of ships we need are going to be more than 355. And when you add in some of the unmanned vessels and things like that that we're going through experimental phases on, it's probably going to be significantly more than [355]," he said.
>
> "There are certain ship classes that don't even exist right now that we're looking at that will be added into that mix, but the broad message is, it's going to be a bigger fleet, it's going to be a more distributed fleet, it's going to be a more agile fleet. And we need to figure out what that path is and also understand our topline limitations, because no one wants a 355-plus fleet that's hollow, that we can't maintain. So we're looking at balancing all those things."
>
> Asked what new ship classes the service is considering, Modly mentioned new amphibious ships, as well as new kinds of supply ships and "lightly manned" ships that are "more like missile magazines that would accompany surface action groups."
>
> Talk of a new class of amphibious warships began last summer, when Commandant of the Marine Corps Gen. David Berger called for alternative kinds of amphibious lift for Marines in his Commandant's Planning Guidance. Since that time, Marine Corps and Navy officials at various conferences have suggested that the services are narrowing in on the Offshore Support Vessel [OSV] as a model for what they want. Having several OSVs instead of one dock landing ship (LSD), for example, might be able to carry the same number of Marines but distribute them across the littorals instead of concentrating them on one hull—which defensively makes them harder to target and offensively allows them to be more agile under the Distributed Maritime Operations and Expeditionary Advance Base Operations concepts.
>
> On the other hand, public talk of a "lightly manned" ship type is new. The Navy had previously envisioned its Large Unmanned Surface Vehicle [LUSV] to serve as a magazine ship for manned combatants, but Congress used its annual defense bill to block the Navy from building an unmanned ship with vertical launch tubes. Making these ships "lightly manned" could keep the magazine ship concept alive while alleviating congressional concerns, and could create the added benefit of allowing the small crews to use their hulls to train with other nations' navies during peacetime….
>
> Modly, when asked why the Navy was betting so much of its ability to get to 355 ships by the end of the decade on quickly acquiring brand new ship classes that haven't gone through the Navy and industry design and construction process yet, said, "I think 'quickly' is going to have to define everything we do, because the world is changing pretty quickly and we're going to have to react more quickly."

> "You look at the frigate [FFG(X)] program: we think, because of the way we've approached that program, we've probably taken three years off the product development lifecycle for that. So we have to start doing the same type of thing: looking at proven hulls, things that can be adaptable for different areas. I understand the Hill's concerns about unmanned, and we get that. … We have to convince them with data: we have to wargame this, we have to iterate it over and over again."
>
> The acting secretary added that President Donald Trump ran in 2016 on a larger fleet, and Congress passed the 355 figure into law in 2017. Though the Navy only has assumptions from wargames and simulations today regarding these new classes of ships, he said the service needed to settle on a "north star" and begin the research and development and construction to get hulls in the water, and then it could refine its vision as needed once fleet leaders understand how the new and old ships work together to bring naval power to a distributed fight.…
>
> Modly said the FY 2021 budget—expected to be released next week—will allow the Navy to grow some, ahead of what he expects will be a much stronger 2022 budget.
>
> "I think what you'll see is mostly an emphasis on readiness—we don't want to have a hollow force, and so we had to make some trades in the end game, but we're still on a path to grow the Navy," he said.
>
> "This year, this budget will keep us on a path to grow to over 300, but the ultimate goal was to grow to an even bigger fleet than that," and the Navy is already looking at its 2022 planning and eyeing multiple paths to grow faster.[14]

The following sections provide details on how the Navy's new fleet architecture could alter the mix of ships within various parts of the Navy.

Potential New Surface Combatant Force Architecture

Statements from Navy officials suggest that the new FSA might shift the Navy's surface combatant force to a more distributed architecture that includes a reduced proportion of large surface combatants (i.e., cruisers and destroyers), an increased proportion of small surface combatants (i.e., frigates and LCSs), and a newly created third tier of unmanned surface vehicles (USVs). In presenting its proposed FY2020 and FY20201 budgets, the Navy has highlighted its plans for developing and procuring USVs in coming years.

Figure 1 provides, for the surface combatant portion of the Navy,[15] a conceptual comparison of the current fleet architecture (shown on the left as the "ship centric force") and the new, more distributed architecture (shown on the right as the "distributed/nodal force"). The figure does not depict the entire surface combatant fleet, but rather a representative portion of it.

In the figure, each sphere represents a manned ship or USV. As shown in the color coding, under both the current fleet architecture and the more distributed architecture, the manned ships (i.e., the LSCs and SSCs) are equipped with a combination of sensors (green), command and control (C2) equipment (red), and payloads other than sensors and C2 equipment, meaning principally weapons (blue).

[14] Megan Eckstein, "SECNAV Modly: Path to 355 Ships Will Rely on New Classes of Warships," *USNI News*, February 3, 2020. See also Rich Abott, "Modly Explains Why 355 Ship FSA In A Decade, Presenting To Esper In Days," *Defense Daily*, January 29, 2020; Rich Abott, "Modly: Future Navy Focusing On Next 10 Years," *Defense Daily*, January 24, 2020.

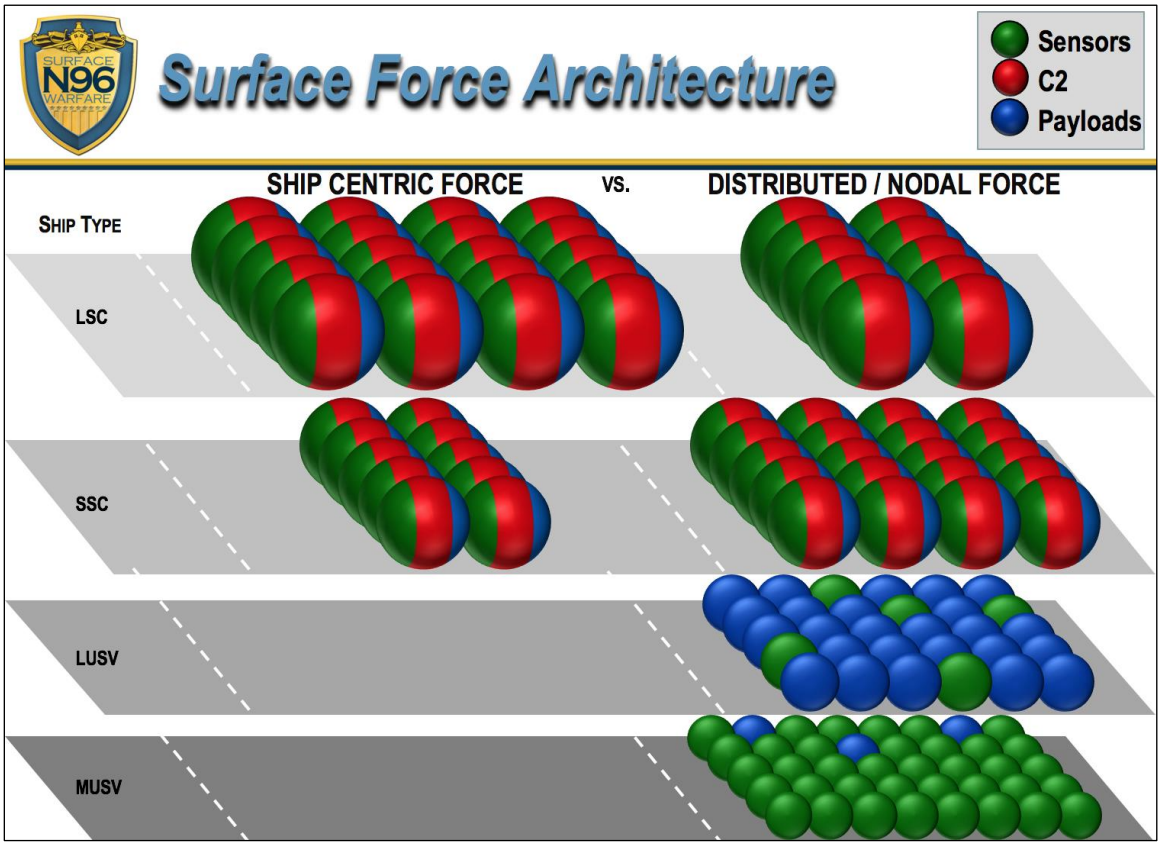
[15] Other major parts of the Navy include submarines, aircraft carriers, amphibious ships, logistics (resupply) ships, and support ships.

Under the more distributed architecture, the manned ships would be on average smaller (because a greater share of them would be SSCs), and this would be possible because some of the surface combatant force's weapons and sensors would be shifted from the manned ships to USVs, with weapon-equipped Large USVs (LUSVs) acting primarily as adjunct weapon magazines and sensor-equipped Medium USVs (MUSVs) contributing to the fleet's sensor network.

As shown in **Figure 1**, under the Navy's current surface combatant force architecture, there are to be 20 LSCs for every 10 SSCs (i.e., a 2:1 ratio of LSCs to SSCs), with no significant contribution from LUSVs and MUSVs. This is consistent with the Navy's current force-level objective, which calls for achieving a 355-ship fleet that includes 104 LSCs and 52 SSCs (a 2:1 ratio). Under the more distributed architecture, the ratio of LSCs to SSCs would be reversed, with 10 LSCs for every 20 SSCs (a 1:2 ratio), and there would also now be 30 LUSVs and 40 MUSVs.

Figure 1. Navy Briefing Slide on Surface Combatant Force Architecture

Each sphere represents a ship or unmanned surface vehicle (USV)



Source: Illustration accompanying Megan Eckstein, "Sea Hunter Unmanned Ship Continues Autonomy Testing as NAVSEA Moves Forward with Draft RFP," *USNI News*, April 29, 2019. The illustration was also included as Slide 2 in a Navy briefing entitled "Designing & Building the Surface Fleet: Unmanned and Small Combatants," by Rear Admiral Casey Moton at a June 20, 2019, conference of the American Society of Naval Engineers (ASNE).

Notes: Each sphere represents a ship or a USV. LSC means large surface combatant (i.e., cruiser or destroyer), and SSC means small surface combatant (i.e., frigate or Littoral Combat Ship). As shown in the color coding, the LSCs and SSCs are equipped with a combination of sensors (green), command and control (C2) equipment (red), and payloads other than sensors and C2 equipment, meaning principally weapons (blue). LUSVs and MUSVs, in contrast, are equipped primarily with weapons (blue) or sensors (green).

A January 15, 2019, press report states

> The Navy plans to spend this year taking the first few steps into a markedly different future, which, if it comes to pass, will upend how the fleet has fought since the Cold War. And it all starts with something that might seem counterintuitive: It's looking to get smaller.
>
> "Today, I have a requirement for 104 large surface combatants in the force structure assessment; [and] I have [a requirement for] 52 small surface combatants," said Surface Warfare Director Rear Adm. Ronald Boxall. "That's a little upside down. Should I push out here and have more small platforms? I think the future fleet architecture study has intimated 'yes,' and our war gaming shows there is value in that."[16]

Another way of summarizing **Figure 1** would be to say that the surface combatant force architecture (reading vertically down the figure) would change from 20+10+0+0 (i.e., a total of 30 surface combatant platforms, all manned, and a platform ratio of 2-1-0-0) for a given portion of the surface combatant force, to 10+20+30+40 (i.e., a total of 100 surface combatant platforms, 70 of which would be LUSVs and MUSVs, and a platform ratio of 1-2-3-4) for a given portion of the surface combatant force. The Navy refers to the more distributed architecture's combination of LSCs, SSCs, LUSVs, and MUSVs as the Future Surface Combatant Force (FSCF).

Figure 1 is conceptual, so the platform ratios for the more distributed architecture should be understood as notional or approximate rather than exact. The point of the figure is not that relative platform numbers under the more distributed architecture would change to the exact ratios shown in the figure, but that they would evolve over time toward something broadly resembling those ratios.[17]

A January 23, 2020, press report states that

> The Navy is expected to finalize next month a major new analysis of its future surface combatant fleet....
>
> The findings are expected to influence force structure decisions in fiscal year 2021 as well as budget and shipbuilding plans beginning in FY-22.
>
> The Future Surface Combatant Force analysis of alternatives [AOA], a 16-month effort, will provide a key input into the Navy's Integrated Force Structure Assessment….
>
> The AOA, according to a senior official, validated a key Navy hypothesis posed in 2018, that a fleet of unmanned surface vessels packed with sensors or loads of missiles give U.S. commanders more options and complicate the calculus for an adversary.[18]

Potential New Amphibious Ship Architecture

Statements from the Commandant of the Marine Corps suggest strongly that the new FSA might change the Navy's amphibious ship force to an architecture based on a new amphibious lift target and a new mix of amphibious ships.

The current 38-ship amphibious ship force-level goal shown in **Table 1** is intended to meet a requirement for having enough amphibious lift to lift the assault echelons of two Marine

[16] David B. Larter, "US Navy Moves Toward Unleashing Killer Robot Ships on the World's Oceans," *Defense News*, January 15, 2019.

[17] For further discussion, see CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke, CRS Report R44972, *Navy Frigate (FFG[X]) Program: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

[18] Jason Sherman, "New Future Surface Combatant Fleet Analysis Validates Contribution of Medium, Large USVs to Fight," *Inside Defense*, January 22, 2020.

Expeditionary Brigades (MEBs), a requirement known as the 2.0 MEB lift requirement. The 2.0 MEB lift requirement dates to 2006. The translation of this lift requirement into a Marine Corps-preferred force-level goal of 38 ships dates to 2009, and the Navy's formal incorporation of the 38-ship goal (rather than a more fiscally constrained goal of 33 or 34 ships) into the Navy's overall ship force-structure goal dates to the 2016 FSA.[19]

In July 2019, General David H. Berger, the Commandant of the Marine Corps, released a document entitled *Commandant's Planning Guidance* that states that the Marine Corps wants to, among other things, move away from the 38-ship amphibious ship force-level goal and the 2.0 MEB lift force-planning metric, and shift to a new and different mix of amphibious ships that includes not only the LHA/LHD-type amphibious assault ships and LPD/LPD-type amphibious ships called for in the 2016 FSA, but other kinds of ships as well, including smaller amphibious ships, ships like the Navy's Expeditionary Sea Base (ESB) and Expeditionary Fast Transport (EPF) ships (referred to collectively as E-class ships), ships based on commercial-ship hull designs, and unmanned surface vehicles (USVs). The *Commandant's Planning Guidance*, which effectively announces a once-in-a-generation change in Marine Corps thinking on this and other issues relating to the Marine Corps, states in part (emphasis as in the original):

> Our Nation's ability to project power and influence beyond its shores is increasingly challenged by long-range precision fires; expanding air, surface, and subsurface threats; and the continued degradation of our amphibious and auxiliary ship readiness. The ability to project and maneuver from strategic distances will likely be detected and contested from the point of embarkation during a major contingency. Our naval expeditionary forces must possess a variety of deployment options, including L-class [amphibious ships] and E-class [expeditionary ships] ships, but also increasingly look to other available options such as unmanned platforms, stern landing vessels, other ocean-going connectors, and smaller more lethal and more risk-worthy platforms. **We must continue to seek the affordable and plentiful at the expense of the exquisite and few when conceiving of the future amphibious portion of the fleet.**
>
> We must also explore new options, such as inter-theater connectors and commercially available ships and craft that are smaller and less expensive, thereby increasing the affordability and allowing acquisition at a greater quantity. We recognize that we must distribute our forces ashore given the growth of adversary precision strike capabilities, so it would be illogical to continue to concentrate our forces on a few large ships. The adversary will quickly recognize that striking while concentrated (aboard ship) is the preferred option. We need to change this calculus with a new fleet design of smaller, more lethal, and more risk-worthy platforms. We must be fully integrated with the Navy to develop a vision and a new fleet architecture that can be successful against our peer adversaries while also maintaining affordability. To achieve this difficult task, the Navy and Marine Corps must ensure larger surface combatants possess mission agility across sea control, littoral, and amphibious operations, while we concurrently expand the quantity of more specialized manned and unmanned platforms….
>
> **We will no longer use a "2.0 MEB requirement" as the foundation for our arguments regarding amphibious ship building, to determine the requisite capacity of vehicles or other capabilities, or as pertains to the Maritime Prepositioning Force. We will no longer reference the 38-ship requirement memo from 2009, or the 2016 Force Structure Assessment, as the basis for our arguments and force structure justifications.** The ongoing 2019 Force Structure Assessment will inform the amphibious requirements based upon this guidance. The global options for amphibs [types of

[19] For additional discussion of the 2.0 MEB lift goal and earlier amphibious lift goals dating back to 1980, see Appendix A of CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

amphibious ships] include many more options than simply LHAs, LPDs, and LSDs. I will work closely with the Secretary of the Navy and Chief of Naval Operations (CNO) to ensure there are adequate numbers of the right types of ships, with the right capabilities, to meet national requirements.

I do not believe joint forcible entry operations (JFEO) are irrelevant or an operational anachronism; however, we must acknowledge that different approaches are required given the proliferation of anti-access/area denial (A2AD) threat capabilities in mutually contested spaces. Visions of a massed naval armada nine nautical miles off-shore in the South China Sea preparing to launch the landing force in swarms of ACVs [amphibious combat vehicles], LCUs [utility landing craft], and LCACs [air-cushioned landing craft]are impractical and unreasonable. We must accept the realities created by the proliferation of precision long-range fires, mines, and other smart-weapons, and seek innovative ways to overcome those threat capabilities. I encourage experimentation with lethal long-range unmanned systems capable of traveling 200 nautical miles, penetrating into the adversary enemy threat ring, and crossing the shoreline—causing the adversary to allocate resources to eliminate the threat, create dilemmas, and further create opportunities for fleet maneuver. We cannot wait to identify solutions to our mine countermeasure needs, and must make this a priority for our future force development efforts….

Over the coming months, we will release a new concept in support of the Navy's Distributed Maritime Operations (DMO) Concept and the NDS called – Stand-in Forces. The Stand-in Forces concept is designed to restore the strategic initiative to naval forces and empower our allies and partners to successfully confront regional hegemons that infringe on their territorial boundaries and interests. **Stand-in Forces are designed to generate technically disruptive, tactical stand-in engagements that confront aggressor naval forces with an array of low signature, affordable, and risk-worthy platforms and payloads.** Stand-in forces take advantage of the relative strength of the contemporary defense and rapidly-emerging new technologies to create an integrated maritime defense that is optimized to operate in close and confined seas in defiance of adversary long-range precision "stand-off capabilities."

Creating new capabilities that intentionally initiate stand-in engagements is a disruptive "button hook" in force development that runs counter to the action that our adversaries anticipate. Rather than heavily investing in expensive and exquisite capabilities that regional aggressors have optimized their forces to target, naval forces will persist forward with many smaller, low signature, affordable platforms that can economically host a dense array of lethal and nonlethal payloads.

By exploiting the technical revolution in autonomy, advanced manufacturing, and artificial intelligence, the naval forces can create many new risk-worthy unmanned and minimally-manned platforms that can be employed in stand-in engagements to create tactical dilemmas that adversaries will confront when attacking our allies and forces forward.[20]

[20] U.S. Marine Corps, *Commandant's Planning Guidance, 38th Commandant of the Marine Corps*, undated, released July 2019, pp. 4-5, 10. See also Megan Eckstein, "New Commandant Berger Sheds 38-Amphib Requirement in Quest to Modernize USMC for High-End Fight," *USNI News*, July 18, 2019; Paul McLeary, "Sacred Cows Die As Marine Commandant Changes Course On Amphibs," *Breaking Defense*, July 26, 2019; David Ignatius, "The Marines' New Commandant Has Set the Bar for Real Military Reform," *Washington Post*, August 8, 2019; Megan Eckstein, "Marine Planners Using Commandant's Guidance to Start Crafting Future of the Corps," *USNI News*, September 18, 2019; Shawn Snow, "An Unmanned Ship That Can Travel 500 Nautical Miles Without Resupply—the Corps Is Looking at It," *Marine Corps Times*, September 19, 2019; Megan Eckstein, "Marines, Navy Both Considering Something Like an Offshore Support Vessel to Supplement Amphibs," *USNI News*, September 20, 2019; David Axe, "U.S. Navy and Marine Corps Want Small Ships to Land Troops in a War," *National Interest*, September 21, 2019; Megan Eckstein, "Navy, Marines Rethinking How to Build Future Fleet with Unmanned, Expeditionary Ships," *USNI News*, September 26, 2019; David Barno and Nora Bensahel, "A Striking New Vision for the marines, and a Wakeup Call for the Other

A February 20, 2020, press report about a potential new type of stern-landing amphibious ship states:

> The Navy's research and development portfolio will devote $30 million to a "next-generation medium amphibious ship design" that will likely be based on an Australian designer's stern landing vessel….
>
> The Navy and Marines announced in the Fiscal Year 2021 budget request that they will seek a medium amphibious ship that can support the kind of dispersed, agile, constantly relocating force described in the Littoral Operations in Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO) concepts the Marine Corps has written, as well as the overarching Distributed Maritime Operations (DMO) from the Navy. According to a budget overview document, "a next-generation medium amphibious ship will be a stern landing vessel to support amphibious ship-to-shore operations."
>
> "FY 2021 funds support concept evaluation/design, industry studies and exploration for a medium-lift intra-theater amphibious support vessel. Efforts include requirements development, systems engineering, naval architecture and marine engineering, and operations research analysis," reads a justification book that accompanies the budget request.
>
> The Navy and Marines had previously cited the Offshore Support Vessel as a possible inspiration for their new design….
>
> However, since that time, Marine Corps planners took another look at the features they'd need on this medium amphibious ship, rather than limiting their talks to existing ship designs, USNI News understands. Those talks led to a realization that they not only wanted a ship that could move Marines around with some range, but they also wanted the ship to be able to beach itself like a landing craft does, to help offload gear and vehicles as needed. These talks led to a new focus on the stern landing vessel designed by Australian company Sea Transport, which could serve as the new inspiration for the medium amphibious vehicle as requirements development and EABO wargaming and simulations take place….
>
> The Navy and Marines are not committed yet to this design or to Sea Transport, but USNI News understands that something like a SLV would combine a surface ship's ability to have great enough endurance and range to be operationally useful to commanders and a landing craft's ability to beach itself to offload larger equipment.[21]

A March 26, 2020, press report stated:

> The Navy is asking industry for input on a future Light Amphibious Warship, as the Marine Corps recalculates its force design to prepare for a near-peer fight in the Pacific.
>
> A recent request for information says the Navy will hold a virtual industry day on April 9….
>
> The Navy anticipates purchasing the first ships in fiscal year 2023, according to slides from the March 4 industry day. A preliminary schedule anticipates the service buying three

Services," *War on the Rocks*, October 1, 2019; Megan Eckstein, "Berger: Marine 2030 Force Design Is Nearly Complete; Concepts Now Being Modeled, Tested," *USNI News*, October 3, 2019; Patrick Tucker, "The Future of the Marines Is Smaller, More Robotic, More Naval," *Defense One*, October 3, 2019; Otto Kreisher, "'Great Power' Fight Might Require Different Blend of Vessels, But Marines Won't Shun Amphibious Operations, NDIA Speakers Say," *Seapower*, October 24, 2019; Megan Eckstein, "Marines, Navy Considering 'Alternate' Amphibs to Supplement Today's Fleet," *USNI News*, October 26, 2019.

[21] Megan Eckstein, "Navy Researching New Class of Medium Amphibious Ship, New Logistics Ships," *USNI News*, February 20, 2020. See also Rich Abott, "FY 2021 Request Starts Work on Future Amphibs and Logistics Ships," *Defense Daily*, February 20, 2020; David Axe, "This Weird Little Ship Could Be the Future of Amphibious Warfare," *National Interest*, February 24, 2020.

> vessels in FY-23, six in FY-24, 10 in FY-25 and nine in FY-26. The Navy also envisions utilizing a commercial design that it could alter for the military.[22]

A May 5, 2020, press report stated:

> The U.S. Navy wants to buy as many as 30 of a new class of Light Amphibious Warships that would be significantly smaller and cheaper to operate than its existing fleets of large amphibious ships. The service is already exploring possible designs, including a roll-on-roll-off type with a stern ramp.…
>
> Navy officials… said that the "objective number" of Light Amphibious Warships (LAW) it hopes to buy is between 28 and 30 at a briefing for defense industry representatives on Apr. 9, 2020….
>
> The Navy is still in an information-gathering phase, but does already have some key requirements for any potential LAW design, which it expects to be about 200 feet long overall and have 8,000 square feet of cargo space in total. Each LAW will have a crew of no more than 40 sailors and be able to accommodate at least 75 Marines….
>
> The Navy says that it is willing to consider either adapting an existing commercial design, using a commercial hullform as a starting place, or a so-called "Build to Print" ship based on proven design elements and components. The goal in all of these courses of action is to focus on relatively low-risk, low-cost, mature designs, or at least design features, in order to both keep the ships cheap and make them faster and easier to build. The Navy has said it is interested in awarding at least one preliminary design contract by the end of this year with the hope that it could begin buying actual ships as early as late 2022.
>
> The service has also indicated that it might be willing to accept ship designs with relatively short expected service lives in order to help keep production costs low and speed up construction. The requirements now say that the LAWs have to have a life span of just 10 years, at a minimum.[23]

Potential New Aircraft Carrier/Naval Aviation Force Architecture

Statements from Navy officials reported in the press beginning in February 2019 indicate that the Navy is currently considering moving to a new aircraft carrier/naval aviation force architecture that might supplement today's CVNs with smaller and perhaps nonnuclear-powered aircraft carriers.[24]

According to these press reports, one option for a smaller carrier is the so-called Lighting Carrier, a term referring to an LHA-type amphibious assault ship equipped with an air wing consisting largely of F-35B Joint Strike Fighter (JSFs). (The alternate name for the F-35 is the Lighting II. The B variant of the F-35, which is currently being procured for the Marine Corps, is short

[22] Mallory Shellbourne, "Navy begins pursuit of Light Amphibious Warship," *Inside Defense*, March 26, 2020.

[23] Joseph Trevithick, "Navy Wants To Buy 30 New Light Amphibious Warships To Support Radical Shift In Marine Ops," *The Drive*, May 5, 2020.

[24] See Rich Abott, "Navy Starts Looking At Carriers After CVN-81," *Defense Daily*, February 15, 2019; Richard R. Burges, "Secretary: Navy Discussing Next-Gen Carrier Concepts, Including 'Lightning Carrier,'" *Seapower*, October 24, 2019; Wesley Morgan, "Navy Secretary Accuses Congressional Critics of 'Disinformation' on Ford Carrier," *Politico Pro*, October 23, 2019; Otto Kreisher, "Spencer Lauds Tight Integration of Navy, Marine Forces in 'Great Power Competition,'" *Seapower*, October 27, 2019; Sam LaGrone, "Navy Still Mulling Post-F-35C Aviation Combatant; Could be Mix of Manned, Unmanned Aircraft," *USNI News*, December 5, 2019; Gina Hawkins, "Acting SecNav Hints at Fewer Aircraft Carriers in Next Ship-Count Plan," *Military.com*, January 29, 2020; Sam LaGrone, "Future of U.S. Carrier Fleet Key Issue as New Force Structure Moves Through Pentagon," *USNI News*, January 29, 2020; Rich Abott, "Modly: Future Carrier Force Unclear, All Options On The Table," *Defense Daily*, January 30, 2020.

takeoff, vertical landing [STOVL] variant that can be operated off of ships with flight decks that are shorter than the flight decks of CVNs.) The Navy and Marine Corps have conducted experiments with the Lightning Carrier concept.[25]

Another option for a smaller carrier is one whose air wing would consist mostly or entirely of unmanned aerial vehicles (UAVs). The Navy in recent years has periodically studied the potential of UAV carriers.

The current discussion both inside and outside the Navy over the aircraft carrier to be procured after CVN-81 appears to reflect several considerations, including the following:

- concerns over China's improving capabilities for detecting surface ships and attacking them with anti-ship ballistic missiles (ASBMs) and advanced anti-ship cruise missiles (ASCMs);
- the procurement and operating and support (O&S) costs of CVNs and their air wings, particularly in a context of constraints on Navy funding and funding demands from other competing Navy programs; and
- the potential capabilities of smaller carriers operating air wings consisting of unmanned aerial vehicles (UAVs) and/or F-35B Joint Strike Fighters (i.e., the short-takeoff, vertical landing [STOVL] version of the F-35 now being procured for the Marine Corps).

A March 9, 2020, Navy news release stated:

> Acting Secretary of the Navy Thomas B. Modly announced today he is commissioning a Blue-Ribbon Future Carrier 2030 (FC-2030) Task Force to conduct a six-month study to reimagine the future of the aircraft carrier and carrier-based naval aviation (manned and unmanned) for 2030 and beyond.
>
> FC-2030 will be complementary to, and informed by a broad review of national shipbuilding requirements being conducted by Deputy Secretary of Defense David L. Norquist. Navy and Marine Corps uniformed and civilian leadership will be engaged in both efforts. FC-2030 will attract current and former leaders from Congress, leaders from the U.S. shipbuilding and supporting technology industries, current and former Department of Defense leaders, as well as thought leaders at War Colleges, think-tanks, and futurists from around the nation.
>
> "The long-term challenges facing our nation and the world demand clear-eyed assessments and hard choices," said Modly. "Because we have four new Ford carriers under contract, we have some time to reimagine what comes next. Any assessment we do must consider cost, survivability, and the critical national requirement to sustain an industrial base that can produce the ships we need—ships that will contribute to a superior, integrated naval force for the 2030s and far beyond.
>
> "Aircraft carrier construction sustains nearly 60,000 skilled jobs in over 46 states," Modly added. "It can't be simply turned on and off like a faucet. We must be thoughtful in how we approach changes as they will have lasting impacts on our national industrial competitiveness and employment."
>
> The task force will be led by an Executive Director chosen from within the Department of the Navy's Secretariat staff, and assisted on a collateral-duty basis by representatives from the Office of Naval Research and the Deputy Chief of Naval Operations for Warfighting Development.

[25] See, for example, Megan Eckstein, "Marines Test 'Lightning Carrier' Concept, Control 13 F-35Bs from Multiple Amphibs," *USNI News*, October 23, 2019.

> Along with an executive director, the FC-2030 Senior Executive Panel will consist of thought leaders with historical records of leading and contributing to large change in maritime defense strategies and programs. Former Senator John Warner of Virginia has agreed to serve as the Honorary Chairman of the Executive Panel. Former Secretary of the Navy John Lehman, former acting Deputy Secretary of Defense Christine Fox, former Deputy Undersecretary of the Navy Seth Cropsey, and former Congressman Randy Forbes have agreed to serve as Executive members of the panel.
>
> "Our future strength will be determined as much by the gray matter we apply to our challenges as the gray hulls we build," said Modly. "We need the best minds from both inside and outside of government focused on this issue."
>
> The study will be conducted with the assistance of the Naval University System (U.S. Naval Academy, Naval War College, Marine Corps University, and Naval Postgraduate School) as well as eligible Federally Funded Research and Development Centers (FFRDCs) and Naval Warfare Centers.
>
> The goal at the end of the study is to provide a report to the secretary of the Navy detailing a vision of the competitive global security environment and the role of carrier-based naval aviation in that future context. Considerations will include expected principles of deterrence, global presence missions, protection of American economic security, as well as potential combat with possible adversaries.
>
> The study will also define likely constraints of means in terms of future defense budgets, as well as avenue to contemplate future possible technologies not yet invented that could change the stakes of carrier-based naval aviation in all phases of global competition.
>
> Finally, the report will provide options for the Department of the Navy in requirements for different various future aircraft (manned and unmanned, nuclear and/or conventional) carriers, to be used in future months and years in developing guidance to industry. The study will also examine how best to utilize and evolve the existing carrier fleet, including the more flexible and adaptable Ford Class, to meet the challenges of advanced long-range weapons that will extend and expand contested areas in the future.[26]

Potential New Combat Logistics Force (CLF) Architecture

The Navy's FY2020 30-year shipbuilding plan suggests that shifting to a more distributed fleet architecture could increase required numbers of Combat Logistics Force (CLF) ships—meaning the oilers, ammunition ships, and dry cargo ships that transport fuel, ammunition, and supplies Navy combat ships that are operating at sea—and augment today's CLF ships with additional "smaller, faster, multi-mission transports."[27]

Potential New Undersea Force Architecture

The new FSA might also change the Navy's undersea force to a more distributed architecture that includes, in addition to attack submarines (SSNs) and bottom-based sensors, a new element of extra-large unmanned underwater vehicles (XLUUVs), which might be thought of as unmanned

[26] Secretary of the Navy Public Affairs, "Acting SECNAV to Commission Future Carrier 2030 Task Force," *Navy News Service*, March 9, 2030. See also Paul McCleary, "Beyond The Ford: Navy Studies Next-Gen Carriers EXCLUSIVE," *Breaking Defense*, March 5, 2020; Megan Eckstein, "Navy Kicks Off Study of Next-Generation Carriers, Naval Aviation," *USNI News*, March 9, 2020; Mallory Shelbourne, "Modly launches 2030 Carrier Task Force," *Inside Defense*, March 10, 2030; Megan Eckstein, "Modly: Parallel Fleet Studies Could Reshape Future of Aircraft Carriers," *USNI News*, March 12, 2030.

[27] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, pp. 7, 15, 17, 24. The quoted phrase is from page 24.

submarines. In presenting its proposed FY2020 budget, the Navy highlighted its plans for developing and procuring UUVs in coming years.[28]

Rationale for a More Distributed Fleet Architecture

Some observers have long urged the Navy to shift to a more distributed fleet architecture, on the grounds that the Navy's current architecture—which concentrates much of the fleet's capability into a relatively limited number of individually larger and more expensive surface ships—is increasingly vulnerable to attack by the improving maritime anti-access/area-denial (A2/AD) capabilities (particularly anti-ship missiles and their supporting detection and targeting systems) of potential adversaries, particularly China.[29] Shifting to a more distributed architecture, these observers have argued, would

- complicate an adversary's targeting challenge by presenting the adversary with a larger number of Navy units to detect, identify, and track;
- reduce the loss in aggregate Navy capability that would result from the destruction of an individual Navy platform;
- give U.S. leaders the option of deploying USVs and UUVs in wartime to sea locations that would be tactically advantageous but too risky for manned ships; and
- increase the modularity and reconfigurability of the fleet for adapting to changing mission needs.[30]

For a number of years, DON leaders acknowledged the views of those observers but continued to support the current fleet architecture. More recently, however, DON leaders appear to have shifted their thinking toward support for moving the fleet to a more distributed architecture. DON leaders appear to have shifted their thinking in favor of a more distributed architecture because they now appear to believe that such an architecture will be

- **operationally necessary**, as the observers have long argued, to respond effectively to the improving maritime A2/AD capabilities of other countries, particularly China;[31]
- **technically feasible** as a result of advances in technologies for UVs and for networking widely distributed maritime forces that include significant numbers of UVs; and
- **affordable**—no more expensive, and possibly less expensive, than the current architecture, so as to fit within future Navy budgets that Navy officials expect to be flat or declining in real (i.e., inflation-adjusted) terms compared to the Navy's current budget.

The more distributed architecture that Navy leaders now appear to support may differ in its details from distributed architectures that the observers have been advocating, but the general idea

[28] For further discussion, see CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

[29] For more on China's maritime A2/AD capabilities, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.

[30] See, for example, Arthur H. Barber, "Redesign the Fleet," *U.S. Naval Institute Proceedings*, January 2019.

[31] See, for example, David B. Larter, "With China Gunning for Aircraft Carriers, US Navy Says It Must Change How It Fights," *Defense News*, December 6, 2019.

of shifting to a more distributed architecture, and of using large UVs as a principal means of achieving that, appears to be similar. The Department of Defense (DOD) states that

> The FY 2020 budget request diversifies and expands sea power strike capacity through procurement of offensively armed Unmanned Surface Vessels (USVs). The USV investment, paired with increased investment in long-range maritime munitions, represents a paradigm shift towards a more balanced, distributed, lethal, survivable, and cost-imposing naval force that will better exploit adversary weaknesses and project power into contested environments.[32]

Distributed Maritime Operations (DMO)

Shifting to a more distributed force architecture, Navy officials have suggested, could be appropriate for implementing the Navy's new overarching operational concept, called Distributed Maritime Operations (DMO). The Navy's FY2020 30-year shipbuilding plan mentions DMO,[33] and a December 2018 document from the Chief of Naval Operations states that the Navy will "Continue to mature the Distributed Maritime Operations (DMO) concept and key supporting concepts" and "Design and implement a comprehensive operational architecture to support DMO."[34] While Navy officials have provided few details in public about DMO, then-Chief of Naval Operations Admiral John Richardson, in explaining DMO, stated in December 2018 that

> Our fundamental force element right now in many instances is the [individual] carrier strike group. We're going to scale up so our fundamental force element for fighting is at the fleet[-wide] level, and the [individual] strike groups plug into those [larger] numbered fleets. And they will be, the strike groups and the fleet together, will be operating in a distributed maritime operations way.[35]

In its FY2020 budget submission, the Navy states that "MUSV and LUSV are key enablers of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy (alone or in teams/swarms), team with individual manned combatants or augment battle groups."[36] The Navy stated in its FY2020 budget submission that a Navy research and development effort focusing on concept generation and concept development (CG/CD) will

> Continue CG/CD development efforts that carry-over from FY[20]19: Additional concepts and CONOPs [concepts of operation] to be developed in FY[20]20 will be determined through the CG/CD development process and additional external factors. Concepts under consideration include Unmanned Systems in support of DMO, Command and Control in

[32] Department of Defense, Office of the Undersecretary of Defense (Comptroller)/Chief Financial Officer, *Defense Budget Overview, United States Department of Defense, Fiscal Year 2020 Budget Request*, March 2019, pp. 4-5 to 4-6.

[33] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, March 2019, pp. 3, 4, 7, 8, 15, 17, 24.

[34] U.S. Navy, Chief of Naval Operations, *A Design for Maintaining Maritime Superiority, Version 2.0*, December 2018, pp. 8, 10.

[35] (Chief of Naval Operations Admiral John Richardson, as quoted in Megan Eckstein, "Navy Planning for Gray-Zone Conflict; Finalizing Distributed Maritime Operations for High-End Fight," *USNI News*, December 19, 2018.)

[36] *Department of Defense, Fiscal Year (FY) 2020 Budget Estimates, Navy Justification Book Volume 2 of 5, Research, Development, Test & Evaluation, Navy, Budget Activity 4*, March 2019, p. 202. See also Kevin Eyer and Steve McJessy, "Operationalizing Distributed Maritime Operations," Center for International Maritime Security (CIMSEC), March 5, 2019; Christopher H. Popa, et al., *Distributed Maritime Operations and Unmanned Systems Tactical Employment*, Naval Postgraduate School, June 2018, 171 pp. (Systems Engineering Capstone Report); Lyla Englehorn, *Distributed Maritime Operations (DMO) Warfare Innovation Continuum (WIC) Workshop September 2017 After Action Report*, Naval Postgraduate School, December 2017, 99 pp.

> support of DMO, Offensive Mine Warfare, Targeting in support of DMO, and Advanced Autonomous/Semi-autonomous Sustainment Systems.[37]

The Navy also stated in its FY2020 budget submission that a separate Navy research and development effort for fleet experimentation activities will include activities that "address key DMO concept action plan items such as the examination of Fleet Command and Maritime Operation Center (MOC) capabilities and the employment of unmanned systems in support of DMO."[38]

A May 16, 2019, press report states

> The Deputy Chief of Naval Operations for Warfare Systems said Wednesday [May 15] he thinks the upcoming Force Structure Assessment (FSA) will focus on smaller surface combatants as the service looks to build up to a 355-ship Navy.
>
> "I certainly don't see that [FSA fleet] number going down, but it is going to be more reflective of the DMO [Distributed Maritime Operations] construct and it includes not just the battle force ships, but the logistics ships, the trainers, the maritime operations centers, everything that we pull together to keep this machine running," Vice Adm. William Merz said during an event at the Center for Strategic and International Studies.
>
> "What we think is going to happen with this FSA is there will be more emphasis on the smaller surface combatants, mostly because the frigate looks like it's coming along very well and it's going to be more lethal than we had planned," Merz said.
>
> Merz explained the likely outcome by comparing it to how Rear Adm. Ron Boxall, director of surface warfare (N96), talks about how the Navy has too many large surface combatants and needs to get more balanced.
>
> "When you look at the lethality of the frigate, yeah that makes sense. So we'll see how the FSA handles the lethality of that – and then how does that bleed over into the other accounts," Merz said….
>
> Merz revealed there will also be "a hard look at the logistics side" because while some logistics ships count as battle force ships some do not. He said the FSA will make an opinion on the non-battle force logistics vessels as well because it does not limit itself to those strict definitions.
>
> The FSA will also take into account the evolution of the air wing, the length of the air wing, the range of the air wing on carriers and amphibious vessels, and how the Navy will cover its responsibilities.[39]

Expeditionary Advanced Base Operations (EABO)

In parallel with DMO, the Marine Corps has developed a new operational concept, called Expeditionary Advanced Base Operations (EABO), that appears related to the earlier-quoted passage from the *Commandant's Planning Guidance* about changing the amphibious lift goal and the amphibious force architecture. Regarding EABO, the *Commandant's Planning Guidance* states the following (emphasis as in the original):

> The 2016 *Marine Corps Operating Concept* (MOC) predates the current set of national strategy and guidance documents, but it was prescient in many ways. It directed partnering

[37] *Department of Defense, Fiscal Year (FY) 2020 Budget Estimates, Navy Justification Book Volume 2 of 5, Research, Development, Test & Evaluation, Navy, Budget Activity 4*, March 2019, p. 1385. See also pp. 1382, 1384, 1443, 1445.

[38] *Department of Defense, Fiscal Year (FY) 2020 Budget Estimates, Navy Justification Book Volume 4 of 5, Research, Development, Test & Evaluation, Navy Budget Activity 6*, March 2019, p. 290.

[39] Rich Abott, "Merz Says FSA To Emphasize Smaller Ships," *Defense Daily*, May 16, 2019.

> with the Navy to develop two concepts, Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO) that nest exceptionally well with the current strategic guidance. It is time to move beyond the MOC itself, however, and partner with the Navy to complement LOCE and EABO with classified, threat-specific operating concepts that describe how naval forces will conduct the range of missions articulated in our strategic guidance….
>
> **EABO complement the Navy's Distributed Maritime Operations Concept and will inform how we approach missions against peer adversaries**….
>
> EABO are driven by the aforementioned adversary deployment of long-range precision fires designed to support a strategy of "counter-intervention" directed against U.S. and coalition forces. EABO, as an operational concept, enables the naval force to persist forward within the arc of adversary long-range precision fires to support our treaty partners with combat credible forces on a much more resilient and difficult to target forward basing infrastructure. EABO are designed to restore force resiliency and enable the persistent naval forward presence that has long been the hallmark of naval forces. Most significantly, EABO reverse the cost imposition that determined adversaries seek to impose on the joint force. EABO guide an apt and appropriate adjustment in future naval force development to obviate the significant investment our adversaries have made in long-range precision fires. Potential adversaries intend to target our forward fixed and vulnerable bases, as well as deep water ports, long runways, large signature platforms, and ships. By developing a new expeditionary naval force structure that is not dependent on concentrated, vulnerable, and expensive forward infrastructure and platforms, we will frustrate enemy efforts to separate U.S. Forces from our allies and interests. EABO enable naval forces to partner and persist forward to control and deny contested areas where legacy naval forces cannot be prudently employed without accepting disproportionate risk….
>
> In February of 2019, the Commandant and Chief of Naval Operations co-signed the concept for EABO. The ideas contained in this document are foundational to our future force development efforts and are applicable in multiple scenarios.[40]

April 2020 Press Report of DOD Assessment on Revised Navy Force-Level Goal

An April 20, 2020, press report stated:

> An internal Office of the Secretary of Defense assessment calls for the Navy to cut two aircraft carriers from its fleet, freeze the large surface combatant fleet of destroyers and cruisers around current levels and add dozens of unmanned or lightly manned ships to the inventory, according to documents obtained by Defense News.
>
> The study calls for a fleet of nine carriers, down from the current fleet of 11, and for 65 unmanned or lightly manned surface vessels. The study calls for a surface force of between 80 and 90 large surface combatants, and an increase in the number of small surface combatants—between 55 and 70, which is substantially more than the Navy currently operates.
>
> The assessment is part of an ongoing DoD-wide review of Navy force structure and seem to echo what Defense Secretary Mark Esper has been saying for months: the Defense Department wants to begin de-emphasizing aircraft carriers as the centerpiece of the Navy's

[40] U.S. Marine Corps, *Commandant's Planning Guidance, 38th Commandant of the Marine Corps*, undated, released July 2019, pp. 9, 11, 19. See also Jim Lacey, "The 'Dumbest Concept Ever' Just Might Win Wars," *War on the Rocks*, July 29, 2019; Megan Eckstein, "How to Seize Islands, Set Up a Forward Refueling Point: Marine Corps Recipes for Exspeditionary Operations," *USNI News*, September 13, 2019.

> force projection and put more emphasis on unmanned technologies that can be more easily sacrificed in a conflict and can achieve their missions more affordably….
>
> There are about 90 cruisers and destroyers in the fleet: the study recommended retaining at least 80 but keeping about as many as the Navy currently operates at the high end.
>
> The Navy's small surface combatant program is essentially the 20 littoral combat ships in commission today, with another 15 under contract, as well as the 20 next-generation frigates, which would get to the minimum number in the assessment of 55 small combatants, with the additional 15 presumably being more frigates.[41]

Issues for Congress

COVID-19 (Coronavirus) Impact on Shipbuilding Programs, Shipyards, Supplier Firms, and Employees

One issue for Congress concerns the potential impact of the COVID-19 (coronavirus) situation on the execution of Navy (and Coast Guard) shipbuilding programs, on the shipyards and associated supplier firms executing these programs, and the employees of these firms. The potential for the COVID-19 (coronavirus) situation to impact work efforts is not unique to Navy (and Coast Guard) shipbuilding—it is a possibility faced by many if not all DOD contractors.[42] The discussion in this report focuses on potential impacts on Navy (and Coast Guard) shipbuilding.[43] Aspects of the discussion below might also apply to impacts of the COVID-19 (coronavirus) situation on government-operated and private-sector shipyards that overhaul, repair, and maintain Navy (and Coast Guard) ships, their associated supplier firms, and their employees.

Potential Impact

Operations at shipyards and associated supplier firms could be affected by the COVID-19 (coronavirus) situation if employees remain home rather than report to work because they are ill with or have tested positive for the virus, are remaining home to maintain social distancing, are taking care of children who have been sent home from school, or are taking care of family members who have become ill from the virus. Impacts on operations at shipbuilding supplier firms could affect operations at the shipyards, even if staffing at the shipyards themselves is not

[41] David B. Larter, "Defense Department Study Calls for Cutting 2 of the US Navy's Aircraft Carriers," *Defense News*, April 20, 2020.

[42] See, for example, Valerie Insinna, "F-35 Deliveries Could Slow Down, as COVID-19 Jolts Lockheed's Supply Chain," *Defense News*, April 21, 2020; Ben Werner, "COVID-19-Related Supply Chain Disruptions Slowing F-35 Production," *USNI News*, April 21, 2020; Jacqueline Feldscher, "Lockheed Concerned About F-35 Production Due to Coronavirus," *Politico Pro*, April 21, 2020; Aaron Mehta, "Pentagon bracing for three-month slowdown on major defense equipment," *Defense News*, April 20, 2020; Paul McCleary, "Pentagon Pumps $3B Into Industry As COVID-19 Delays Loom," *Breaking Defense*, April 20, 2020; Megan Eckstein, "DoD: Shipbuilding, Aviation Hardest-Hit Sectors in Defense Industrial Base by COVID Pandemic," *USNI News*, April 20, 2020; Vivienne Machi, "DoD Expecting Three-Month Delays for Major Acquisition Programs," *Defense Daily*, April 20, 2020; Lara Seligman, "Pentagon Expects 3-Month Delay to Major Acquisition Programs Due to Virus," *Politico Pro*, April 20, 2020 Marcus Weisgerber, "USN, USAF Acquisition Chiefs Talk COVID; Shipbuilder Staggers Shifts; Contractor Accidentally Ejects Himself; and More…," *Defense One*, April 16, 2020; Jon Harper, "Pandemic: Coronavirus Rattles the Defense Industrial Base," *National Defense*, April 14, 2020.

[43] CRS reports on Coast Guard shipbuilding programs include CRS Report R42567, *Coast Guard Cutter Procurement: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL34391, *Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress*, by Ronald O'Rourke.

substantially affected, due to reduced or delayed deliveries to the shipyards of supplier-provided components and materials.[44]

Delays in building ships and fabricating their components could put shipyards and supplier firms at risk of not being able to meet their contractual obligations, which in turn could affect their financial situations unless the government were to provide relief. Shipyard and supplier-firm employees who report to work could face a risk of exposure to the virus, while those who are sent home by their employer could face a loss of income for a period lasting weeks or months.

Although all U.S. Navy (and Coast Guard) shipbuilding programs could be affected, one shipbuilding program of potential particular note in this connection is Columbia-class ballistic missile submarine program, due to the program's high priority (it is the Navy's top program priority), the program's tight schedule for designing and building the lead boat in time for the boat to be ready to conduct its scheduled first strategic nuclear deterrent patrol in 2031, and the potential consequences for the nation's strategic nuclear deterrent posture if the lead boat is not ready in time to conduct that patrol. The COVID-19 (coronavirus) risk to the schedule for designing and building the lead boat in the Columbia-class program is discussed in the CRS report on that program.[45]

Past Examples of Assistance to Shipyards and Supplier Firms

Potential options for Congress for providing assistance to affected shipyards and supplier firms could take various forms. Some past instances of assistance relating to shipbuilding include the following:

- Following Hurricane Katrina in August 2005, Congress provided $1.7 billion in reallocated emergency supplemental appropriations to pay estimated higher shipbuilding costs for 11 Navy ships under construction at the Ingalls shipyard in Pascagoula, MS, and the Avondale shipyard upriver from New Orleans, LA.[46]

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[44] For articles discussing DOD supplier firms during the COVID-19 (coronavirus) situation, see Justin Doubleday, "Pentagon 'Learning More Than Ever' About Supply Chain Vulnerabilities During COVID-19 Crisis," *Inside Defense*, April 28, 2020; Jacqueline Feldscher, "Parts of Defense Supply Chain Under Pressure Despite Federal, Industry Aid," *Politico Pro*, April 21, 2020; Valerie Insinna and Aaron Mehta, "The Pentagon's Supply Chain Faces An Economy Under Siege," *Defense News*, April 8, 2020.

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

[46] See CRS Report RS22239, *Emergency Supplemental Appropriations for Hurricane Katrina Relief*, by Keith Bea, August 22, 2006, p. 6. The report states:

> Citing the need for "special oversight" of these shipbuilding funds dedicated to cover property damage, cleanup, idle payroll, and business disruption (that may also be covered by shipbuilders' insurance), the appropriators added report language requiring that the Navy or Army, as applicable, submit a report to the Appropriations Committees "certifying" that the costs were related to the hurricanes and would not be paid for by FEMA or the shipbuilders' insurers.
>
> (U.S. House, Conference Committees 2005, *Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2006, and for Other Purposes*, conference report to accompany H.R. 2863, H.Rept. 109-359, 109th Cong., 1st sess. [Washington: GPO, 2005], p. 496.)

See also CRS Report RL33298, *FY2006 Supplemental Appropriations: Iraq and Other International Activities; Additional Hurricane Katrina Relief*, Paul M. Irwin, Coordinator, Larry Nowels, Coordinator, June 15, 2006, pp. 59-66; and CRS Report RL33197, *Reallocation of Hurricane Katrina Emergency Appropriations: Defense and Other Issues*, Coordinated by Amy Belasco, December 15, 2005, pp. 9-14. (These CRS reports are out of print and available for congressional clients from the author of this report.)

- The American Recovery and Reinvestment Act (ARRA) of 2009 (H.R. 1/P.L. 111-5 of February 17, 2009), which was enacted in response to the 2008-2009 recession, appropriated $100 million for the Maritime Administration (MARAD) to be used for making supplemental grants to small shipyards as authorized under Section 3508 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (S. 3001/P.L. 110-417 of October 14, 2008) or 46 U.S.C. 54101.[47]
- Following Hurricane Michael in October 2018, the Department of Homeland Security (DHS), of which the Coast Guard is a part, announced on October 11, 2019, that DHS had granted extraordinary contractual relief to Eastern Shipbuilding Group (ESG) of Panama City, FL, the builder of the first of the Coast Guard's new Offshore Patrol Cutters (OPCs), under P.L. 85-804 as amended (50 U.S.C. 1431-1435). P.L. 85-804, originally enacted in 1958, 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.[48] ESG reportedly submitted a request for extraordinary relief on June 30, 2019, after ESG's shipbuilding facilities were damaged by Hurricane Michael.[49]

The past instances listed above do not necessarily represent the full range of options available to Congress for assisting shipyards and supplier firms—additional options might be available through the Defense Production Act (DPA) or other federal authorities.[50]

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[47] Section 3508 of P.L. 110-417 amended the U.S. Code to add Section 54101 to Title 46, which establishes a program for assistance for small shipyards and maritime communities.

[48] 50 U.S.C. 1431 states in part:

> The President may authorize any department or agency of the Government which exercises functions in connection with the national defense, acting in accordance with regulations prescribed by the President for the protection of the Government, to enter into contracts or into amendments or modifications of contracts heretofore or hereafter made and to make advance payments thereon, without regard to other provisions of law relating to the making, performance, amendment, or modification of contracts, whenever he deems that such action would facilitate the national defense. The authority conferred by this section shall not be utilized to obligate the United States in an amount in excess of $50,000 without approval by an official at or above the level of an Assistant Secretary or his Deputy, or an assistant head or his deputy, of such department or agency, or by a Contract Adjustment Board established therein.

For more on P.L. 85-804 as amended, see CRS Report 76-261, *Extraordinary Contractual Relief Under Public Law 85-804*, April 28, 1976, by Andrew C. Mayer. The report was prepared at the request of the House Armed Services Committee and converted by the committee into a committee print (70-905 O), dated May 10, 1976, that can be viewed at https://ufdc.ufl.edu/AA00022546/00001/1j. See also David H. Peirez, "Public Law 85-804: Contractual Relief for the Government Contractor," *Administrative Law Review*, vol. 16 (Summer 1964): 248-264, accessed October 11, 2019, at https://www.jstor.org/stable/40708469; and "Presidential Power: Public Law 85-804 (50 U.S.C. §§ 1431-35)," Brennan Center for Justice, undated, accessed October 11, 2019, at https://www.brennancenter.org/sites/default/files/analysis/50%20USC%201431-1435.pdf. (Although it is undated, it appears to have been written no earlier than 2014, as it includes three references to the year 2014, including one that states, "As of 2014….") The text of P.L. 85-804 as originally enacted is posted at https://www.govinfo.gov/content/pkg/STATUTE-72/pdf/STATUTE-72-Pg972.pdf.

[49] For more on the extraordinary contractual relief provided to ESG under P.L. 85-804, see CRS Report R42567, *Coast Guard Cutter Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

[50] For more on the DPA in the context of the COVID-19 (coronavirus) situation, see CRS Report R43767, *The Defense Production Act of 1950: History, Authorities, and Considerations for Congress*, by Michael H. Cecire and Heidi M. Peters, and CRS Insight IN11231, *The Defense Production Act (DPA) and COVID-19: Key Authorities and Policy Considerations*, by Michael H. Cecire and Heidi M. Peters. See also Scott F. Roybal and Laura A. Alexander, "Coronavirus and its Implications for Government Contractors," *National Law Review*, March 9, 2020.

Potential Oversight Questions

Potential oversight questions for Congress include the following:

- How might the COVID-19 (coronavirus) situation affect the execution of Navy (and Coast Guard) shipbuilding programs, the shipyards and associated supplier firms executing these programs, and the employees of these firms?
- How well do Navy (and Coast Guard) officials understand these potential impacts?
- What are Navy (and Coast Guard) officials doing to anticipate, monitor, and respond to this situation?
- Does Congress have adequate visibility into the impact of the COVID-19 (coronavirus) situation on the execution of Navy (and Coast Guard) shipbuilding programs, the shipyards and associated supplier firms executing these programs, and the employees of these firms? Are the Navy and industry doing enough to brief and keep Congress up to date on the situation?

Additional Background Information

For additional background information on the potential impact of the COVID-19 (coronavirus) situation on the execution of Navy (and Coast Guard) shipbuilding programs, on the shipyards and associated supplier firms executing these programs, and the employees of these firms, see **Appendix J** (which presents the texts of letters from Members of Congress) and **Appendix K** (which presents DOD and Navy memoranda and excerpts from press reports).

COVID-19 (Coronavirus) Impact on U.S. Defense Strategy and Budgets

Another potential oversight issue for Congress is how the COVID-19 (coronavirus) situation could affect future U.S. defense strategy and budgets, and consequently Navy planning for future fleet size and architecture. As discussed in another CRS report,[51] some (but not all) observers argue that the COVID-19 pandemic could lead to a revised definition of U.S. national security that is less military-centric than traditional definitions, and that the substantial federal expenditures being made to support the U.S. economy during the pandemic stay-at-home period, and the effect that these expenditures will have on the federal budget deficit and U.S. debt, could lead to greater constraints in coming years on U.S. defense spending levels.

Such changes, some (but not all) observers argue, could lead to potentially significant changes in U.S. defense strategy and in funding levels for the Navy, which in turn could lead to changes in Navy force-level goals and associated shipbuilding programs that in theory could go beyond (or take Navy planning in a direction different from) those contemplated in the INFSA.

[51] CRS Report R46336, *COVID-19: Potential Implications for International Security Environment—Overview of Issues and Further Reading for Congress*, by Ronald O'Rourke, Kathleen J. McInnis, and Michael Moodie.

FY2021 Budget's Treatment of CVN-81, LPD-31, and LHA-9 Procurement Dates

A potentially significant institutional issue for Congress concerns the treatment in the Navy's proposed FY2021 budget of the procurement dates of the aircraft carrier CVN-81 and the amphibious ships LPD-31 and LHA-9.

As discussed earlier, the Navy's FY2021 budget submission presents the aircraft carrier CVN-81 as a ship that Congress procured in FY2020. Consistent with congressional action on the Navy's FY2019 budget regarding the procurement of CVN-81 (see **Appendix I**), this CRS report treats CVN-81 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2019.

As also discussed earlier, the Navy's FY2021 budget submission presents LPD-31, an LPD-17 Flight II amphibious ship, as a ship requested for procurement in FY2021, and the amphibious assault ship LHA-9 as a ship projected for procurement in FY2023. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LPD-31 and LHA-9 (see **Appendix I**), this CRS report treats LPD-31 and LHA-9 as ships that Congress procured (i.e., authorized and provided procurement funding for) in FY2020.

Potential oversight issues for Congress include the following:

- By presenting CVN-81 as a ship that was procured in FY2020 (instead of a ship that was procured in FY2019), LPD-31 as a ship requested for procurement in FY2021 (instead of a ship that was procured in FY2020), and LHA-9 as a ship projected for procurement in FY2023 (instead of a ship that was procured in FY2020), is DOD, in its FY2021 budget submission, disregarding or mischaracterizing the actions of Congress regarding the procurement dates of these three ships? If so:
  - Is DOD doing this to inflate the apparent number of ships requested for procurement in FY2021 and the apparent number of ships included in the five-year shipbuilding plan?
  - Could this establish a precedent for DOD in the future to ignore or mischaracterize the actions of Congress regarding the procurement or program-initiation dates for other Navy ships, other Navy programs, other DOD programs, or other federal programs? If so, what implications might that have for the preservation and use of Congress's power of the purse under Article 1 of the Constitution, and for maintaining Congress as a co-equal branch of government relative to the executive branch?

Reprogramming of FY2020 Funding for LHA-9 and EPF Ship

On February 13, 2020 (i.e., three days after submitting its proposed FY2021 defense budget), the Administration submitted a reprogramming action that transfers about $3.8 billion in DOD funding to Department of Homeland Security (DHS) counter-drug activities, commonly reported to mean the construction of the southern border wall. Included in this action is $650 million that Congress appropriated in FY2020 for the amphibious assault ship LHA-9, and $261 million that Congress appropriated in FY2020

for an expeditionary fast transport (EPF) ship.[52] The $650 million represents about 17% (i.e., about one-sixth) of the estimated cost of LHA-9; the $261 million is the full procurement cost of the EPF.

The reprogramming action acknowledges that LHA-9 and the EPF ship are congressional special interest items, meaning items that Congress funded at levels above what DOD had requested. (The Navy's FY2020 budget submission requested no funding for either ship.) The reprogramming action characterizes the $650 million as "early to current programmatic need," even though it would be needed for a ship whose construction would begin in FY2020. In discussing its FY2021 budget submission, Navy officials characterize LHA-9 not as ship whose procurement the Navy is proposing to delay from FY2020 to FY2023, but as a ship whose procurement the Navy is proposing to accelerate from FY2024 (the ship's procurement date under the Navy's FY2020 budget submission) to FY2023. The reprogramming action characterizes the EFP as "excess to current [Navy] programmatic need. The procurement exceeds the [Navy's] program-of-record requirement."

Potential oversight issues for Congress include the following:

- By reprogramming the funding for LHA-9 and the EPF ship to another purpose, is DOD, in its FY2021 budget submission, disregarding the expressed intent of Congress regarding the procurement of these two ships?
- If so, could this establish a precedent for DOD or other parts of the executive branch in the future to disregard the intent of Congress regarding the procurement or program-initiation dates for other Navy ships, other Navy programs, other DOD programs, or other federal programs? What implications might that have for the preservation and use of Congress's power of the purse under Article 1 of the Constitution, and for maintaining Congress as a co-equal branch of government relative to the executive branch?

Delay in Submission of FY2021 30-year Shipbuilding Plan

Another issue for Congress concerns the delay in the submission of the Navy's FY2021 30-year (FY2021-FY2050) shipbuilding plan, and the impact this delay may have on Congress's ability to assess and mark up the Navy's proposed FY2021 budget. 10 U.S.C. 231 states that DOD "shall include" the 30-year shipbuilding plan "with the defense budget materials for a fiscal year." Navy officials have stated that the 30-year shipbuilding plan, like the INFSA, is being reviewed by the Office of the Secretary of Defense.[53] In late-February, Acting Secretary of the Navy Thomas Modly said it could be submitted within "a couple of months."[54]

The 30-year shipbuilding plan is intended to provide Congress with supporting information for assessing and marking up the Navy's proposed shipbuilding program. The discussion of the 30-year plan in this CRS report is one reflection of the role that the 30-year shipbuilding plan plays in that regard.

[52] Department of Defense, Reprogramming action (form DD 1415), DOD Serial Number FY 20-01 RA, February 13, 2020, page 3 of 5.

[53] See, for example, Sam LaGrone, "SECDEF Esper Holds Back 30-Year Shipbuilding Outlook, New 355-Ship Plan Ahead of HASC Testimony," *USNI News*, February 25, 2020.

[54] See, for example, Mallory Shelbourne, "Modly Says He Expects to Submit Shipbuilding Plan 'In a Couple of Months,'" *Inside Defense*, February 27, 2020.

In addition to requiring DOD to submit the 30-year plan with its annual defense budget materials, 10 U.S.C. 231 requires CBO to submit, within 60 days of the submission of the Navy's 30-year shipbuilding plan, a report assessing the cost and prospective affordability of the plan. As reflected in this CRS report, CBO's report assessing the Navy's 30-year shipbuilding plan forms a significant element of the annual discussion of the Navy's shipbuilding program. A delay in the submission of the 30-year shipbuilding plan will lead to a delay in the submission of CBO's report.

CRS and CBO testified regarding the value to Congress of the 30-year shipbuilding plan at a June 1, 2011, hearing before the Oversight and Investigations subcommittee of the House Armed Services Committee.[55] In its testimony, CRS stated:

> The main purpose of the 30-year shipbuilding plan is to support effective congressional oversight of DOD plans for Navy shipbuilding by giving Congress information that is important to performing this oversight function but not available in the five-year data of the Future Years Defense Plan (FYDP). The 30-year plan supports effective congressional oversight of DOD plans for Navy shipbuilding in at least five ways:
>
> - The 30-year shipbuilding plan enables Congress to assess whether the Navy intends to procure enough ships to achieve and maintain its stated ship force-level goals….
> - The 30-year shipbuilding plan helps Congress determine whether there is a fundamental imbalance between Navy program goals and projected Navy resources…
> - The 30-year shipbuilding plan helps Congress to assess whether DOD ship procurement plans are likely to be affordable within future defense budgets….
> - Supporting information provided in conjunction with the 30-year shipbuilding plan enables Congress to assess whether Navy ship procurement planning is reasonable in terms of assumed service lives for existing ships and estimated procurement costs for new ships….
> - The 30-year shipbuilding plan enables Congress to assess the potential industrial-base implications of DOD's intentions for ship procurement.[56]

In its testimony, CBO similarly stated:

> The 30-year ship and aircraft plans benefit Congressional oversight and decisions about funding in at least three different ways:
>
> - Thirty-year plans may reveal cumulative long-term effects of annual appropriation decisions that may not be apparent from a shorter perspective.
> - Such plans may also reveal imbalances between long-term objectives for inventories and projected budgetary resources.
> - The plans provide information on DoD's assumptions about the service lives of major weapons systems and how those assumptions may affect its inventory goals.[57]

[55] See Statement of Ronald O'Rourke, Specialist in Naval Affairs, Congressional Research Service, before the House Armed Services Committee Subcommittee on Oversight and Investigations hearing on the Department of Defense's 30-Year Aviation and Shipbuilding Plans, June 1, 2011, 8 pp., and Congressional Budget Office, Statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, [on the] The Value of 30-Year Defense Procurement Plans for Congressional Oversight and Decisionmaking before the Subcommittee on Oversight and Investigations, Committee on Armed Services, U.S. House of Representatives, June 1, 2011, 7 pp.

[56] Statement of Ronald O'Rourke, Specialist in Naval Affairs, Congressional Research Service, before the House Armed Services Committee Subcommittee on Oversight and Investigations hearing on the Department of Defense's 30-Year Aviation and Shipbuilding Plans, June 1, 2011, pp. 1-2.

[57] Congressional Budget Office, Statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, [on the] The

Adequacy of Proposed FY2021 Shipbuilding Budget and Five-Year Shipbuilding Plan

Another issue for Congress concerns the adequacy of the proposed FY2021 shipbuilding budget, which requests the procurement of seven new ships, and the FY2021 five-year shipbuilding plan, which includes 42 new ships, relative to the Navy's goal of attaining a fleet of 355 ships within 10 years. Potential oversight issues for Congress include the following:

- Would the procurement of seven new ships in FY2021, and a total of 42 ships over the five-year period FY2021-FY2025, be consistent with a goal of attaining a fleet of 355 ships within 10 years? In conjunction with this level of new ship procurement, to what degree would the Navy need to extend the service lives of existing ships to attain a fleet of 355 new ships within 10 years? How would the mix of that 355-ship fleet compare to the mix called for in the 2016 FSA (shown in **Table 1**)?
- Within the Navy's FY2021 budget top line and its projected funding levels through FY2025, does the Navy's FY2021 budget submission strike the proper balance between funding for new ship procurement and funding for other Navy priorities, such as restoring eroded ship readiness and improving fleet lethality? Is there a mismatch between the Navy's budget top line and the Navy's desire to achieve a 355-ship fleet within 10 years while also adequately funding other Navy priorities?

How INFSA Will Change Fleet Architecture, 355-Ship Goal, Mix of Ships to Be Procured, and Distribution of Shipbuilding Work

Another issue for Congress is how the INFSA will change the Navy's fleet architecture, the Navy's current 355-ship force-level goal, the mix of Navy ships to be procured, and the distribution of Navy shipbuilding work among the nation's shipyards.

Affordability of 30-Year Shipbuilding Plan

As mentioned earlier, the Navy has not yet submitted its FY2021 30-year (FY2021-FY2050) shipbuilding plan. As a placeholder pending the submission of that plan, the discussion below of specific points regarding the affordability of the Navy's 30-year shipbuilding plan is based on the Navy's FY2020 30-year plan.

Overview

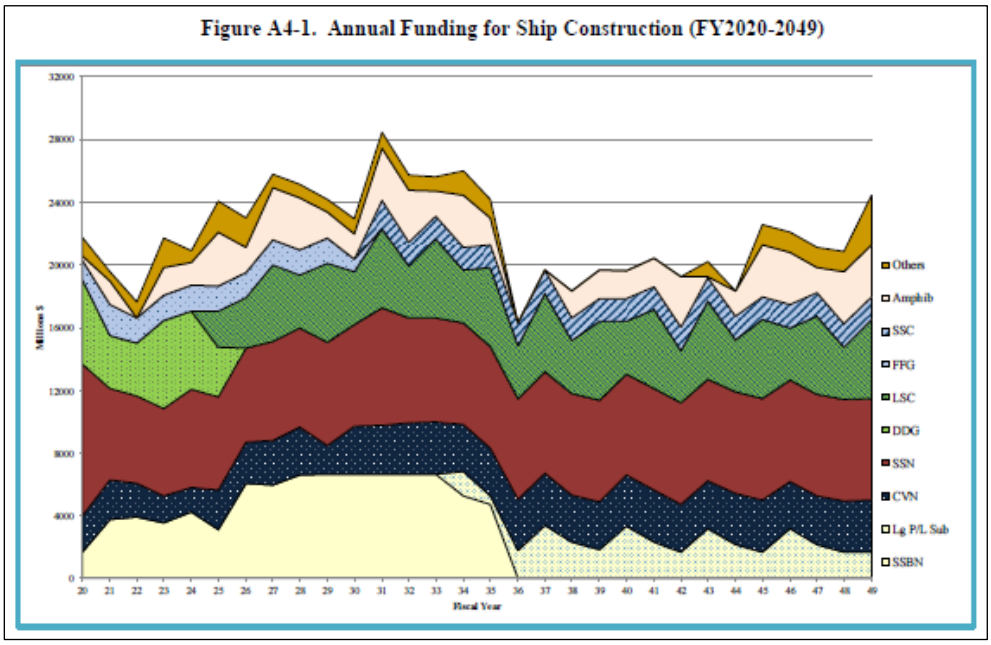
Another oversight issue for Congress has concerned the prospective affordability of the Navy's 30-year shipbuilding plan. This issue has been a matter of oversight focus for several years, and particularly since the enactment in 2011 of the Budget Control Act, or BCA (S. 365/P.L. 112-25 of August 2, 2011). Aspects of this issue could change if the INFSA shifts the Navy to a new fleet architecture and a changed mix of ships to be procured in coming years. The discussion below is based on the Navy's current fleet architecture.

Value of 30-Year Defense Procurement Plans for Congressional Oversight and Decisionmaking before the Subcommittee on Oversight and Investigations, Committee on Armed Services, U.S. House of Representatives, June 1, 2011, p. 1.

Based on the Navy's current fleet architecture, observers have been particularly concerned about the 30-year shipbuilding plan's prospective affordability during the decade or so from the mid-2020s through the mid-2030s, when the plan calls for procuring Columbia-class ballistic missile submarines as well as replacements for large numbers of retiring attack submarines, cruisers, and destroyers.[58] **Figure 2** shows, in a graphic form, the Navy's estimate of the annual amounts of funding that would be needed to implement the Navy's FY2020 30-year shipbuilding plan. The figure shows that during the period from the mid-2020s through the mid-2030s, the Navy estimates that implementing the FY2020 30-year shipbuilding plan would require roughly $24 billion per year in shipbuilding funds.

Figure 2. Navy Estimate of Funding Requirements for FY2020 30-Year Plan

Constant FY2019 dollars, in millions



Source: U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, Figure A4-1 on page 18.

Navy officials have stated at hearings on the Navy's FY2021 budget submission that achieving and supporting a 355-ship fleet over the next 10 years would require increasing the Navy's budget by a cumulative total of $120 billion to $130 billion over the next ten years, or an average of $12 billion to $13 billion per year. This figure, Navy officials have stated, includes not only the cost of procuring new ships, but costs associated with crewing, arming, operating, and maintaining a 355-ship fleet.[59] To help generate some of this funding from within the Navy's own

[58] The Navy's 30-year plans in recent years have spotlighted for policymakers the substantial increase in Navy shipbuilding funding that would be required to implement the 30-year plan during the decade or so from the mid-2020s through the mid-2030s. As discussed in CRS testimony in 2011, a key function of the 30-year shipbuilding plan is to alert policymakers well ahead of time to periods of potentially higher funding requirements for Navy shipbuilding. (See Statement of Ronald O'Rourke, Specialist in Naval Affairs, Congressional Research Service, before the House Armed Services Committee, Subcommittee on Oversight and Investigations, hearing on the Department of Defense's 30-Year Aviation and Shipbuilding Plans, June 1, 2011, 8 pp.)

[59] See, for example, Ben Werner, "SECNAV Modly: Navy Needs Additional $120 Billion To Build 355-Ship Fleet By 2030," *USNI News*, February 27, 2020.

budget, Acting Secretary of the Navy Thomas Modly in February 2020 announced that the Navy would conduct a "Stem to Stern" review of its spending with the aim of identifying $40 billion over the next five years (i.e., an average of $8 billion per year) that can be redirected from lower-priority efforts to the goal of achieving and maintaining a larger fleet.[60]

Prior to this—in September and October 2019—Navy officials had stated that if Navy budgets in coming years remain at current levels in real (i.e., inflation-adjusted terms), the Navy would not be able to properly maintain a fleet of more than 302 to 310 ships. A September 16, 2019, press report quoted Under Secretary of the Navy Thomas Modly as stating in a speech on that date: "I will tell you it is going to be very, very difficult for us to get to that number [355 ships] in any reasonable amount of time." According to the press report, Modly stated: "If you look at our funding in the [Navy] and straight line that on our current budget projections, we can probably get to about 305 to 308 ships and sustain that over time without a significant increase in our budget." The press report stated that "the under secretary said the service [i.e., the Navy] would likely need $20 billion to $30 billion more annually to achieve a 355-ship fleet 'quickly, and when I say "quickly" I mean within five to 10 years.'"[61]

An October 27, 2019, press report, reporting on remarks made by Under Secretary Modly on October 25, stated

> The size of the current fleet, the high cost of new ships and the likely lack of growth in future budgets will make it difficult for the Navy to reach the current goal of a 355-ship battle fleet, the Navy's number two civilian leader [Modly] said….
>
> Modly went through the top 10 issues that keep him up at night, three of which dealt with the problem of buying and sustaining enough ships to get the size fleet the U.S. Navy will need for the possible future conflicts. The effort to get from the current 290-ship force to the 355 goal faces "a math problem," he said, because future defense budgets are not likely to grow enough to buy all those ships.[62]

An October 28, 2019, press report stated

> The Navy is unlikely to field a 355-ship fleet in the near- or even mid-term future if funding doesn't change dramatically, the department's top leadership said during a pair of appearances last week.
>
> The 355-ship Navy is a nice target; however, ship readiness is more critical for the service as it plans how the fleet will look in the future, Vice Chief of Naval Operations Adm. Robert Burke said Friday [October 25] while speaking with reporters at the Military Reporters and Editors conference.
>
> "Will we get to 355-ships?" Burke said. "I think with today's fiscal situation, where the Navy's top line is right now, we can keep around 305 to 310 ships whole, properly manned, properly maintained, properly equipped, and properly ready."…

[60] See, for example, Megan Eckstein and Ben Werner, "Acting SECNAV Kicks off Navy 'Night Court' Cost Savings Drive with Aim to Save $40 Billion," *USNI News*, February 18, 2020; Paul McLeary, "Navy Looks to Slash $40B To Build Bigger Fleet," *Breaking Defense*, February 18, 2020; Justin Katz, "Modly Announces Navy Program Review Seeking $40B in Savings," *Inside Defense*, February 19, 2020; Ben Werner, "Navy $40 Billion Savings Effort Linked to Force Structure Assessment," *USNI News*, February 21, 2020; Sam LaGrone, "Navy Mulling Taking Sailors off Forward Deployed Ships as Part of $40B Savings Drive," *USNI News*, March 11, 2020.

[61] Justin Katz, "Modly Acknowledges 355 Ships Won't Happen in 'Reasonable' Amount of Time," Inside Defense, September 16, 2019.

[62] Otto Kreisher, "Modly Doubts Future Budgets Will Allow for 355-Ship Fleet," *Seapower*, October 27, 2019.

> "If our top line does not go up, if it remains where it is now and is projected to remain in the future defense plans, that's about where we can get to and do it right, in terms of man those ships and maintain them and have all the ordnance for them and generate readiness," Burke said. "We would need an increased top line."[63]

In January 2020, Admiral Michael Gilday, the Chief of Naval Operations, stated that fully funding the Navy's program goals, including the attainment of a 355-ship fleet, would require allocating a larger share of DOD's budget to the Navy.[64]

Concern Regarding Potential Impact of Columbia-Class Program

As discussed in the CRS report on the Columbia-class program,[65] the Navy since 2013 has identified the Columbia-class program as its top program priority, meaning that it is the Navy's intention to fully fund this program, if necessary at the expense of other Navy programs, including other Navy shipbuilding programs. This led to concerns that in a situation of finite Navy shipbuilding budgets, funding requirements for the Columbia-class program could crowd out funding for procuring other types of Navy ships. These concerns in turn led to the creation by Congress of the National Sea-Based Deterrence Fund (NSBDF), a fund in the DOD budget that is intended in part to encourage policymakers to identify funding for the Columbia-class program from sources across the entire DOD budget rather than from inside the Navy's budget alone.

Several years ago, when concerns arose about the potential impact of the Columbia-class program on funding available for other Navy shipbuilding programs, the Navy's shipbuilding budget was roughly $14 billion per year, and the roughly $7 billion per year that the Columbia-class program is projected to require from the mid-2020s to the mid-2030s (see **Figure 2**) represented roughly one-half of that total. With the Navy's shipbuilding budget having grown in more recent years to a total of roughly $24 billion per year, the $7 billion per year projected to be required by the Columbia-class program during those years does not loom proportionately as large as it once did in the Navy's shipbuilding budget picture. Even so, some concerns remain regarding the potential impact of the Columbia-class program on funding available for other Navy shipbuilding programs.

Potential for Cost Growth on Navy Ships

If one or more Navy ship designs turn out to be more expensive to build than the Navy estimates, then the projected funding levels shown in **Figure 2** would not be sufficient to procure all the ships shown in the 30-year shipbuilding plan. As detailed by CBO[66] and GAO,[67] lead ships in

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[63] Ben Werner, "Admiral: Navy Can Afford to Field a 310-Ship Fleet, Not 355," *USNI News*, October 28, 2019. See also Rich Abott, "Navy Says Current Funding Only Supports 310 Ships," *Defense Daily*, October 28, 2019; Paul McLeary, "Navy May Scrap Goal of 355 Ships; 310 Is Likely," *Breaking Defense*, October 25, 2019.

[64] See, for example, Marcus Weisgerber, "The US Navy Needs More Money, Its Top Admiral Bluntly Argues," *Defense One*, January 14, 2020; Sam LaGrone, "CNO Gilday Calls for Budget Increase to Reach 355 Ship Fleet; New Battle Force Count Won't Include Unmanned Ships," *USNI News*, January 14, 2020; John M. Doyle, "CNO Wants Larger Slice of Defense Budget to Modernize, Meet China Threat," *Seapower*, January 15, 2020; Rich Abott, "CNO: Ship Count Will Not Include Unmanned; Bigger Topline Needed For Fleet Goal," *Defense Daily*, January 15, 2020.

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

[66] See Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2019 Shipbuilding Plan*, October 2018, p. 25, including Figure 10.

[67] See Government Accountability Office, *Navy Shipbuilding[:] Past Performance Provides Valuable Lessons for Future Investments*, GAO-18-238SP, June 2018, p. 8.

Navy shipbuilding programs in many cases have turned out to be more expensive to build than the Navy had estimated. Ship designs that can be viewed as posing a risk of being more expensive to build than the Navy estimates include Gerald R. Ford (CVN-78) class aircraft carriers, Columbia-class ballistic missile submarines, Virginia-class attack submarines equipped with the Virginia Payload Module (VPM), Flight III versions of the DDG-51 destroyer, FFG(X) frigates, LPD-17 Flight II amphibious ships, and John Lewis (TAO-205) class oilers, as well as other new classes of ships that the Navy wants to begin procuring years from now.

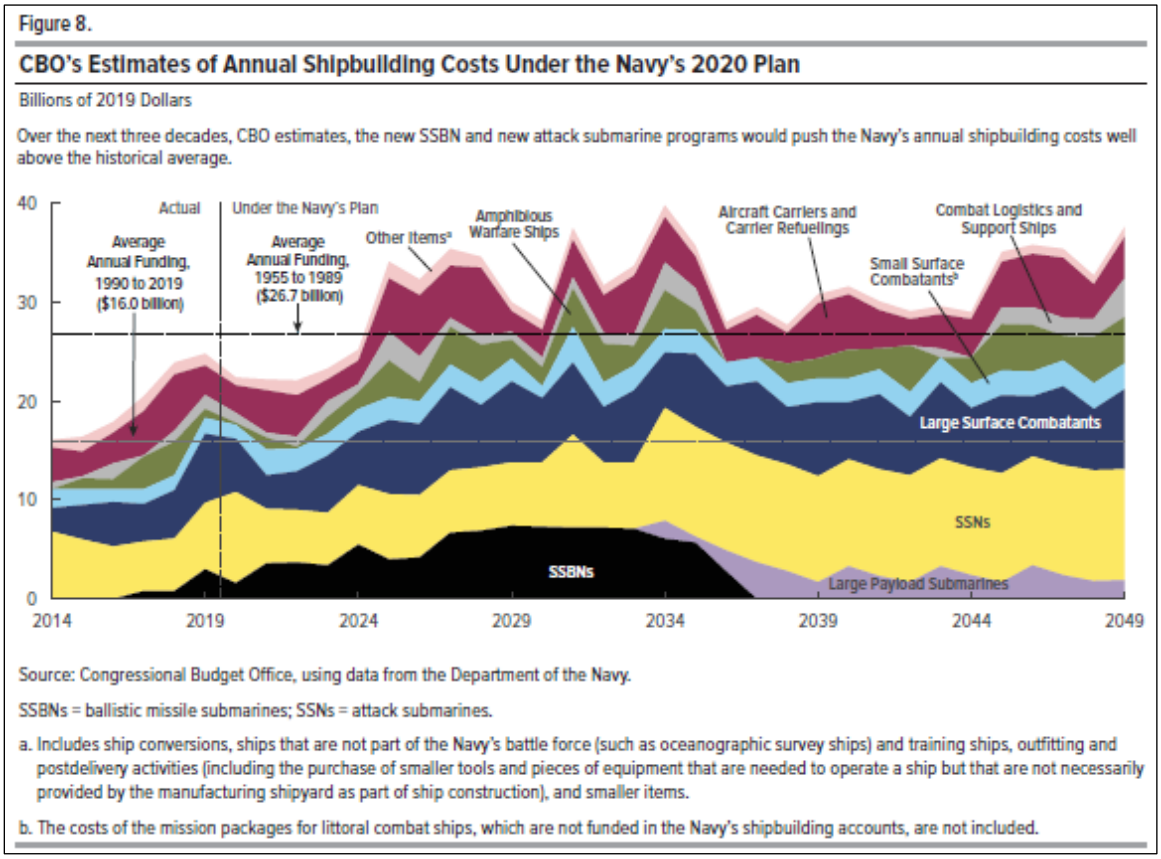
CBO Estimate

As mentioned earlier, the statute that requires the Navy to submit a 30-year shipbuilding plan each year (10 U.S.C. 231) also requires CBO to submit its own independent analysis of the potential cost of the 30-year plan (10 U.S.C. 231[d]). **Figure 3** shows, in a graphic form, CBO's estimate of the annual amounts of funding that would be needed to implement the Navy's FY2020 30-year shipbuilding plan. This figure can be compared to the Navy's estimate of its FY2020 30-year plan as shown in **Figure 2**.

FY2020 30-year plan, in part because there are a substantial number of these SSNs in the plan, and because those ships occur in the latter years of the plan, where the effects of the technical difference between CBO and the Navy regarding the treatment of inflation show more strongly.

Figure 3. CBO Estimate of Funding Requirements for 30-Year Plan

Constant FY2019 dollars, in billions



Source: Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2020 Shipbuilding Plan*, October 2019, Figure 8 on page 16.

CBO analyses of past Navy 30-year shipbuilding plans have generally estimated the cost of implementing those plans to be higher than what the Navy estimated. Consistent with that past pattern, as shown in **Table 5**, CBO's estimate of the cost to implement the Navy's FY2020 30-year shipbuilding plan is about 31% higher than the Navy's estimated cost for the FY2020 plan. More specifically, as shown in the table, CBO estimated that the cost of the first 10 years of the FY2020 30-year plan would be about 2% higher than the Navy's estimate; that the cost of the middle 10 years of the plan would be about 21% higher than the Navy's estimate; and that the cost of the final 10 years of the plan would be about 41% higher than the Navy's estimate.[68]

Table 5. Navy and CBO Estimates of Cost of 30-Year Shipbuilding Plan

Funding for new-construction ships, in billions of constant FY2019 dollars

	First 10 years of the plan	Middle 10 years of the plan	Final 10 years of the plan	Entire 30 years of the plan
Navy estimate	20.3	24.4	21.8	22.0
CBO estimate	20.7	29.7	30.7	28.8
% difference between Navy and CBO estimates	2	21	41	31

Source: Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2020 Shipbuilding Plan,* October 2019, Table 4 on page 13.

Notes: The figures shown for "% difference" are those presented in the CBO report, which are derived from dollar figures for the Navy and CBO estimates that were subsequently rounded off by CBO for presentation in its report. This is why the figure for "% difference" for the middle 10 years of the plan shows as 21% rather than 22%.

Treatment of Inflation

The growing divergence between CBO's estimate and the Navy's estimate as one moves from the first 10 years of the 30-year plan to the final 10 years of the plan is due in part to a technical difference between CBO and the Navy regarding the treatment of inflation. This difference compounds over time, making it increasingly important as a factor in the difference between CBO's estimates and the Navy's estimates the further one goes into the 30-year period. In other words, other things held equal, this factor tends to push the CBO and Navy estimates further apart as one proceeds from the earlier years of the plan to the later years of the plan.[69]

Designs of Future Classes of Ships

The growing divergence between CBO's estimate and the Navy's estimate as one moves from the first 10 years of the 30-year plan to the final 10 years of the plan is also due to differences between CBO and the Navy about the costs of certain ship classes, particularly classes that are projected to be procured starting years from now. The designs of these future ship classes are not yet determined, creating more potential for CBO and the Navy to come to differing conclusions regarding their potential cost.

[68] Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2020 Shipbuilding Plan*, October 2019, Table 4 on page 13.

[69] For additional discussion of how CBO estimates the costs of new Navy ships, see Congressional Budget Office, *How CBO Estimates the Cost of New Ships*, April 2018, 6 pp.

For the FY2020 30-year plan, the largest source of difference between CBO and the Navy regarding the costs of individual ship classes is a new class of SSNs that the Navy wants to begin procuring in FY2031 as the successor to the Virginia-class SSN design. This new class of SSNs, CBO says, accounts for 34% of the difference between the CBO and Navy estimates for the

The second-largest source of difference between CBO and the Navy regarding the costs of individual ship classes is a new class of large surface combatant (i.e., cruiser or destroyer) that the Navy wants to begin procuring in FY2025, which accounts for 33% of the difference, for reasons that are similar to those mentioned above for the new class of SSNs.

The third-largest source of difference is the new class of frigates (FFG[X]s) that the Navy wants to begin procuring in FY2020, which accounts for 10% of the difference.

The remaining 23% of difference between the CBO and Navy estimates is accounted for collectively by several other shipbuilding programs, each of which individually accounts for between 1% and 4% of the difference. The Columbia-class program, which accounts for 4% of the difference, is one of the programs in this final group.[70]

Sustainment Cost

In addition to the issue of the cost to build new ships, the Navy in its FY2020 30-year shipbuilding plan highlighted a concern over the potential costs to sustain a larger fleet. On this issue, the FY2020 30-year shipbuilding plan states in part

> Coincident with the relatively new dynamic of purchasing more ships to grow the force instead of simply replacing ships or shrinking the force, is the responsibility to "own" the additional inventory when it arrives.
>
> Consistent annual funding in the shipbuilding account is foundational for an efficient industrial base in support of steady growth and long-term maintenance planning, but equally important is the properly phased, additional funding needed for operations and sustainment accounts as each new ship is delivered—the much larger fiscal burden over the life of a ship and the essence of the challenge to remain balanced across the three integral elements of readiness–capability–capacity. Because the Navy [until recently] has been shrinking not growing, and because of the disconnected timespan from purchase to delivery, often five years or more and often beyond the FYDP, there is risk of underestimating the aggregate sustainment costs looming over the horizon that must now be carefully considered in fiscal forecasting.
>
> For a ship, the rough rule of thumb for cost is 30 percent for procurement and 70 percent for operating and sustainment; for example, a ship that costs $1B to buy costs $3.3B to own, amortized over its lifespan. Accordingly, multi-ship deliveries can add hundreds of millions of dollars to a budget year, and then require the same funding per year thereafter, compounded by additional deliveries in subsequent years and only offset by ship retirements, which lag deliveries when growing the force. A similar dynamic occurs when the life of a ship is extended. Sustainment resources programmed to shift from a retiring ship to a new ship must now stay in place – for the duration of the extension. The burden continues to grow until equilibrium is reached at the desired higher inventory, when deliveries match retirements and all resourcing accounts reach steady-state at a higher, enduring sustainment cost.
>
> For perspective, the current budget, among the largest ever, supports a modern fleet of approximately 300 ships, nearly 20 percent fewer than the goal of 355. The battle force

[70] Congressional Budget Office, *An Analysis of the Navy's Fiscal Year 2020 Shipbuilding Plan*, October 2019, Table A-1 on page 29.

> inventory… rises from 301 ships in FY2020 to [a projected figure of] 314 ships in FY2024, and then 355 in FY2034. The programmed sustainment cost… is $24B [billion] in FY2020 and rises to $30B [billion in FY2024 in TY$ [then-year dollars]. When the battle force inventory reaches 355 in FY2034, [the] estimated cost to sustain that fleet will approach $40B (TY$), 32% higher than in FY2024. For now, included in this sustainment estimate are only personnel, planned maintenance, and some operations; representing those costs tied directly to owning and operating a ship, easily modeled today, and already line-item accounted for in the budget. Equally important additional costs, but not yet included in the future estimate, are those not easily associated with individual ships and require complex modeling for long-term forecasting (beyond 3 to 5 years), such as the balance of the operations accounts (market and schedule driven), modernization and ordnance (threat and technology driven), infrastructure and training (services spread across many ships), aviation detachments, networks and cyber support, plus others….
>
> Less of a challenge when shrinking the force, the Navy is now working towards developing the complex model needed to capture indirect costs for growing the force. Until then, macro ratios are helpful in estimating rough orders of magnitude beyond the FYDP and for identifying future areas of concern. Similar to procurement, estimates will be less precise deeper into the plan. Recovering from the long-term investment imbalance has proven to be costly, particularly in the readiness accounts. As readiness becomes more accurately defined, the modeling will improve and so will the ability to more accurately forecast. However, no matter the method, the anticipated cost of sustaining the proper mix of 355 ships is anticipated to be substantial, and reform efforts and balanced scalability will continue to be the drivers going forward.[71]

A May 15, 2019, press report states:

> The service [the navy] is also getting some sobering feedback on how much it will cost to sustain a significantly larger fleet— something it hasn't had to do in decades.
>
> As the Navy plans for more ships, Vice Adm. William Merz Deputy Chief Of Naval Operations For Warfare Systems said Wednesday, "we're also coming to realize what that is going to cost, and how you're going to sustain today's fleet while continuing to grow." The planning process is "much more challenging than anyone realized," he said, "but we're much smarter about our business" than just a few years ago….
>
> … taking the fleet from under 300 ships to at least 355 is a daunting task, Merz said at the Center for Strategic and International Studies. "We don't have the complex modeling to even understand what all of these costs are going to materialize to over the next 20 years," he said, but the service is "working hard to converge on a model" to sustain the ships over the long haul.[72]

Legislative Activity for FY2021

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:

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[71] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, pp. 19-20.

[72] Paul McLeary, "Navy Wary of Growing Costs While It Ramps Up Ops," *Breaking Defense*, May 15, 2019.

- 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 (SSN-774) Class Attack Submarine Procurement: 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. (This report also covers the issue of the Administration's FY2020 budget proposal, which the Administration withdrew on April 30, to not fund a mid-life refueling overhaul [called a refueling complex overhaul, or RCOH] for the aircraft carrier *Harry S. Truman* [CVN-75], and to retire CVN-75 around FY2024.)
- CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke.
- CRS Report R44972, *Navy Frigate (FFG[X]) 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 R43546, *Navy John Lewis (TAO-205) Class Oiler 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 FY2021 Funding Request

The Navy's proposed FY2021 budget requests funding for the procurement of 7 new ships:

- 1 Columbia-class ballistic missile submarine;
- 1 Virginia-class attack submarine;
- 2 DDG-51 class Aegis destroyers;
- 1 FFG(X) frigate;
- 2 TATS towing, salvage, and rescue ships.

As discussed earlier, the Navy's FY2021 budget submission presents LPD-31, an LPD-17 Flight II amphibious ship, as a ship requested for procurement in FY2021. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LPD-31, this CRS report treats LPD-31 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2020.

The Navy's proposed FY2021 shipbuilding budget also requests funding for ships that have been procured in prior fiscal years, and ships that are to be procured in future fiscal years, as well as funding for activities other than the building of new Navy ships.

Table 6 summarizes congressional action on the Navy's FY2021 funding request for Navy shipbuilding. The table shows the amounts requested and congressional changes to those requested amounts. A blank cell in a filled-in column showing congressional changes to requested amounts indicates no change from the requested amount.

Table 6. Summary of Congressional Action on FY2021 Funding Request

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

			Congressional changes to requested amounts					
			Authorization			Appropriation		
Line number	Program	Request	HASC	SASC	Conf.	HAC	SAC	Conf.
Shipbuilding and Conversion, Navy (SCN) appropriation account								
001	Columbia-class SSBN	2,891.5						
002	Columbia-class SSBN (AP)	1,123.2						
003	CVN 78-80 aircraft carriers	997.5						
004	CVN-81 aircraft carrier	1,645.6						
005	Virginia-class SSN	2,334.7						
006	Virginia-class SSN (AP)	1,901.2						
007	CVN RCOH	1,878.5						
008	CVN RCOH (AP)	17.4						
009	DDG-1000	78.2						
010	DDG-51	3,040.3						
011	DDG-51 (AP)	29.3						
012	LCS	0						
013	FFG(X)	1,053.1						
014	LPD-17 Flight II	1,155.8						
015	LPD-17 Flight II (AP)	0						
016	Expeditionary Sea Base (ESB)	0						
017	LHA amphibious assault ship	0						
018	LHA amphibious assault ship (AP)	0						
019	Expeditionary Fast Transport (EPF)	0						
020	TAO-205 oiler	0						
021	TAO-205 oiler (AP)	0						
022	TATS	168.2						
023	LCU 1700 landing craft	87.4						
024	Outfitting and post delivery	825.6						
025	Ship-to-shore connector (SSC)	0						
026	Service craft	249.8						
027	LCAC landing craft SLEP	56.5						
028	Completion of PY ships	369.1						
TOTAL		**19,902.8**						

Source: Table prepared by CRS based on Navy FY2021 budget submission, committee reports, and explanatory statements on the FY2021 National Defense Authorization Act and FY2020 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** is advance procurement funding; **HASC** is House Armed Services Committee; **SASC** is Senate Armed Services Committee; **HAC** is House Appropriations Committee; **SAC** is Senate Appropriations Committee; **Conf.** is conference report.

SHIPS Implementation Act (S. 3258)

On February 5, 2020, Senator Wicker introduced the Securing the Homeland by Increasing our Power on the Seas (SHIPS) Implementation Act. The text of the bill states:

A BILL

To foster the implementation of the policy of the United States to achieve 355 battle force ships as soon as practicable.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. Short title.

This Act may be cited as the "Securing the Homeland by Increasing our Power on the Seas Implementation Act" or "SHIPS Implementation Act".

SEC. 2. Findings.

Congress makes the following findings:

(1) The 2016 Navy Force Structure Assessment (FSA) started with a request to the combatant commanders to provide their unconstrained desire for Navy forces in their respective theaters consistent with meeting the demands of the Defense Planning Scenarios. To fully resource these platform-specific demands with very little risk in any theater while supporting enduring missions, ongoing two operations and setting the theater for prompt warfighting response, the Navy would require a 653-ship force.

(2) The 2016 Navy FSA further determined that a 355-ship battle force is the level that balances an acceptable level of warfighting risk to Navy equipment and personnel against available resources and achieves a force size that can reasonably achieve success.

(3) On March 27, 2019, before the Committee on Armed Services of the Senate, Vice Admiral William Merz testified, "I certainly do not expect the [355-ship requirement] to go any lower. I would not be surprised if it goes up in several categories.".

(4) The Navy battle force currently consists of 293 ships.

(5) The Navy projects having 313 battle force ships in 2025.

(6) The Navy assesses the size of the People's Liberation Army Navy as having surpassed that of the United States Navy and predicts that it will reach 400 ships in 2025.

(7) Section 1025 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 7921 note) established the policy of the United States to have available, as soon as practicable, not fewer than 355 battle force ships, with funding subject to the availability of appropriations or other funds.

(8) The Department of Defense has been able to achieve program efficiencies and cost savings by using multiyear and block buy contracting with many weapons programs. These contracting strategies are currently being utilized to procure Ford-class aircraft carriers, Arleigh Burke-class destroyers, Virginia-class submarines, and John Lewis-class fleet oilers.

SEC. 3. Sense of Congress on implementation of the Securing the Homeland by Increasing our Power on the Seas Implementation Act.

It is the sense of Congress that to achieve the national policy of the United States to have available, as soon as practicable, not fewer than 355 battle force ships—

(1) the Navy must be adequately resourced to increase the size of the Navy in accordance with the national policy, which includes the associated ships, aircraft, personnel, sustainment, and munitions;

(2) across fiscal years 2021 through 2025, the Navy should start construction on not fewer than—

(A) 12 Arleigh Burke-class destroyers;

(B) 10 Virginia-class submarines;

(C) 2 Columbia-class submarines;

(D) 3 San Antonio-class amphibious ships;

(E) 1 LHA-class amphibious ship;

(F) 6 John Lewis-class fleet oilers; and

(G) 5 guided missile frigates;

(3) new guided missile frigate construction should increase to a rate of between two and four ships per year once design maturity and construction readiness permit;

(4) the Columbia-class submarine program should be funded using the National Sea Based Deterrence Fund with funds that are in addition to the Navy budget in recognition of the critical single national mission that these vessels will perform;

(5) stable shipbuilding rates of construction should be maintained for each vessel class, utilizing multi-year or block buy contract authorities when appropriate, until a deliberate transition plan is identified; and

(6) prototyping of potential new shipboard subsystems should be accelerated to build knowledge systematically, and, to the maximum extent practicable, shipbuilding prototyping should occur at the subsystem-level in advance of ship design.

SEC. 4. Procurement authorities for certain shipbuilding programs.

(a) Contract authority.—

(1) PROCUREMENT AUTHORIZED.—In fiscal year 2021, the Secretary of the Navy may enter into one or more contracts for the procurement of any or all of the following groups of vessels:

(A) Three San Antonio-class amphibious ships and one America-class amphibious ship.

(B) Two Columbia-class submarines.

(C) Six John Lewis-class fleet oilers.

(2) PROCUREMENT IN CONJUNCTION WITH EXISTING CONTRACTS.—The ships authorized to be procured under paragraph (1) may be procured as additions to existing contracts covering such programs.

(b) Certification required.—A contract may not be entered into under subsection (a) unless the Secretary of the Navy certifies to the congressional defense committees, in writing, not later than 30 days before entry into the contract, each of the following, which shall be prepared by the milestone decision authority for such programs:

(1) The use of such a contract will result in significant savings compared to the total anticipated costs of carrying out the program through annual contracts. In certifying cost savings under the preceding sentence, the Secretary shall include a written explanation of—

(A) the estimated end cost and appropriated funds by fiscal year, by hull, without the authority provided in subsection (a);

(B) the estimated end cost and appropriated funds by fiscal year, by hull, with the authority provided in subsection (a);

(C) the estimated cost savings or increase by fiscal year, by hull, with the authority provided in subsection (a);

(D) the discrete actions that will accomplish such cost savings or avoidance; and

(E) the contractual actions that will ensure the estimated cost savings are realized.

(2) There is a reasonable expectation that throughout the contemplated contract period the Secretary of the Navy will request funding for the contract at the level required to avoid contract cancellation.

(3) There is a stable design for the property to be acquired and the technical risks associated with such property are not excessive.

(4) The estimates of both the cost of the contract and the anticipated cost avoidance through the use of a contract authorized under subsection (a) are realistic.

(5) The use of such a contract will promote the national security of the United States.

(6) During the fiscal year in which such contract is to be awarded, sufficient funds will be available to perform the contract in such fiscal year, and the future-years defense program (as defined under section 221 of title 10, United States Code) for such fiscal year will include the funding required to execute the program without cancellation.

(c) Use of incremental funding.—With respect to a contract or contracts entered into pursuant to subsection (a)(1)(B), the Secretary of the Navy may use incremental funding to make payments under the contract with funds appropriated to the Shipbuilding and Conversion, Navy or National Sea Based Deterrence Fund accounts through fiscal year 2025.

(d) Authority for advance procurement.—The Secretary of the Navy may enter into one or more contracts for advance procurement associated with a vessel or vessels for which authorization to enter into a multiyear procurement contract is provided under subsection (a), and for systems and subsystems associated with such vessels in economic order quantities when cost savings are achievable.

(e) Condition for out-Year contract payments.—A contract entered into under subsection (a) shall provide that any obligation of the United States to make a payment under the contract for a fiscal year is subject to the availability of appropriations for that purpose for such fiscal year.

(f) Definitions.—In this section:

(1) CONGRESSIONAL DEFENSE COMMITTEES.—The term “congressional defense committees” has the meaning given the term in section 101(a)(16) of title 10, United States Code.

(2) MILESTONE DECISION AUTHORITY.—The term “milestone decision authority” has the meaning given the term in section 2366a(d) of title 10, United States Code.

Appendix A. Strategic and Budgetary Context

This appendix presents some brief comments on elements of the strategic and budgetary context in which U.S. Navy force structure and shipbuilding plans may be considered.

Shift in International Security Environment

World events in recent years have led observers, particularly since late 2013, to conclude that the international security environment in recent years has undergone a shift from the post-Cold War era that began in the late 1980s and early 1990s, also sometimes known as the unipolar moment (with the United States as the unipolar power), to a new and different situation that features, among other things, renewed great power competition with China and Russia and challenges by these two countries and others to elements of the U.S.-led international order that has operated since World War II. This situation, which has multiple potential implications for U.S. defense plans and programs, is discussed further in another CRS report.[73]

World Geography, U.S. Grand Strategy, and U.S. Naval Forces[74]

From a U.S. perspective on grand strategy and geopolitics,[75] it can be noted that most of the world's people, resources, and economic activity are located not in the Western Hemisphere, but in the other hemisphere, particularly Eurasia. In response to this basic feature of world geography, U.S. policymakers for the past several decades have chosen to pursue, as a key element of U.S. national strategy, a goal of preventing the emergence of a regional hegemon in one part of Eurasia or another, on the grounds that such a hegemon could represent a concentration of power strong enough to threaten vital U.S. interests by, for example, denying the United States access to some of the other hemisphere's resources and economic activity. Although U.S. policymakers have not often stated this key national strategic goal explicitly in public, U.S. military (and diplomatic) operations in recent decades—both wartime operations and day-to-day operations—can be viewed as having been carried out in no small part in support of this key goal.

The traditional U.S. goal of preventing the emergence of a regional hegemon in one part of Eurasia or another has been a major reason why the U.S. military is structured with force elements that enable it to cross broad expanses of ocean and air space and then conduct sustained,

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[73] CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

[74] For a stand-alone CRS product covering much of the same material presented in this section, see CRS In Focus IF10485, *Defense Primer: Geography, Strategy, and U.S. Force Design*, by Ronald O'Rourke.

[75] The term *grand strategy* generally refers in foreign policy discussions to a country's overall approach for securing its interests and making its way in the world, using all the national instruments at its disposal, including diplomatic, informational, military, and economic tools (sometimes abbreviated in U.S. government parlance as DIME). A country's role in the world can be viewed as a visible expression of its grand strategy. For the United States, grand strategy can be viewed as a design or blueprint at a global or interregional level, as opposed to U.S. approaches for individual regions, countries, or issues.

The term *geopolitics* is often used as a synonym for international politics or for strategy relating to international politics. More specifically, it refers to the influence of basic geographic features on international relations, and to the analysis of international relations from a perspective that places a strong emphasis on the influence of such geographic features. Basic geographic features involved in geopolitical analysis include things such as the relative sizes and locations of countries or land masses; the locations of key resources such as oil or water; geographic barriers such as oceans, deserts, and mountain ranges; and key transportation links such as roads, railways, and waterways.

For additional discussion, see CRS Report R44891, *U.S. Role in the World: Background and Issues for Congress*, by Ronald O'Rourke and Michael Moodie.

large-scale military operations upon arrival. Force elements associated with this goal include, among other things, an Air Force with significant numbers of long-range bombers, long-range surveillance aircraft, long-range airlift aircraft, and aerial refueling tankers, and a Navy with significant numbers of aircraft carriers, nuclear-powered attack submarines, large surface combatants, large amphibious ships, and underway replenishment ships.

The United States is the only country in the world that has designed its military to cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival. The other countries in the Western Hemisphere do not design their forces to do this because they cannot afford to, and because the United States has been, in effect, doing it for them. Countries in the other hemisphere do not design their forces to do this for the very basic reason that they are already in the other hemisphere, and consequently instead spend their defense money on forces that are tailored largely for influencing events in their own local region.

The fact that the United States has designed its military to do something that other countries do not design their forces to do—cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival—can be important to keep in mind when comparing the U.S. military to the militaries of other nations. For example, in observing that the U.S. Navy has 11 aircraft carriers while other countries have no more than one or two, it can be noted other countries do not need a significant number of aircraft carriers because, unlike the United States, they are not designing their forces to cross broad expanses of ocean and air space and then conduct sustained, large-scale military operations upon arrival.

As another example, it is sometimes noted, in assessing the adequacy of U.S. naval forces, that U.S. naval forces are equal in tonnage to the next dozen or more navies combined, and that most of those next dozen or more navies are the navies of U.S. allies. Those other fleets, however, are mostly of Eurasian countries, which do not design their forces to cross to the other side of the world and then conduct sustained, large-scale military operations upon arrival. The fact that the U.S. Navy is much bigger than allied navies does not necessarily prove that U.S. naval forces are either sufficient or excessive; it simply reflects the differing and generally more limited needs that U.S. allies have for naval forces. (It might also reflect an underinvestment by some of those allies to meet even their more limited naval needs.)

Countries have differing needs for naval and other military forces. The United States, as a country located in the Western Hemisphere that has adopted a goal of preventing the emergence of a regional hegemon in one part of Eurasia or another, has defined a need for naval and other military forces that is quite different from the needs of allies that are located in Eurasia. The sufficiency of U.S. naval and other military forces consequently is best assessed not through comparison to the militaries of other countries, but against U.S. strategic goals.

More generally, from a geopolitical perspective, it can be noted that that U.S. naval forces, while not inexpensive, give the United States the ability to convert the world's oceans—a global commons that covers more than two-thirds of the planet's surface—into a medium of maneuver and operations for projecting U.S. power ashore and otherwise defending U.S. interests around the world. The ability to use the world's oceans in this manner—and to deny other countries the use of the world's oceans for taking actions against U.S. interests—constitutes an immense asymmetric advantage for the United States. This point would be less important if less of the world were covered by water, or if the oceans were carved into territorial blocks, like the land. Most of the world, however, is covered by water, and most of those waters are international waters, where naval forces can operate freely. The point, consequently, is not that U.S. naval forces are intrinsically special or privileged—it is that they have a certain value simply as a consequence of the physical and legal organization of the planet.

Potential Change in U.S. Role in the World

The U.S. role in the world refers to the overall character, purpose, or direction of U.S. participation in international affairs and the country's overall relationship to the rest of the world. The U.S. role in the world can be viewed as establishing the overall context or framework for U.S. policymakers for developing, implementing, and measuring the success of U.S. policies and actions on specific international issues, and for foreign countries or other observers for interpreting and understanding U.S. actions on the world stage.

While descriptions of the U.S. role in the world since the end of World War II vary in their specifics, it can be described in general terms as consisting of four key elements: global leadership; defense and promotion of the liberal international order; defense and promotion of freedom, democracy, and human rights; and prevention of the emergence of regional hegemons in Eurasia.

A change in the U.S. role could have significant and even profound effects on U.S. security, freedom, and prosperity. It could lead to a change in U.S. grand strategy (see previous section), which in turn could lead to significant changes to U.S. defense plans and programs, including plans and programs relating to the Navy.

Some observers, particularly critics of the Trump Administration, argue that under the Trump Administration, the United States is substantially changing the U.S. role in the world. Other observers, particularly supporters of the Trump Administration, while acknowledging that the Trump Administration has changed U.S. foreign policy in a number of areas compared to policies pursued by the Obama Administration, argue that under the Trump Administration, there has been less change and more continuity regarding the U.S. role in the world. The situation is discussed further in another CRS report.[76]

Declining U.S. Technological and Qualitative Edge

DOD officials have expressed concern that the technological and qualitative edge that U.S. military forces have had relative to the military forces of other countries is being narrowed by improving military capabilities in other countries. China's improving military capabilities are a primary contributor to that concern.[77] Russia's rejuvenated military capabilities are an additional contributor. DOD in recent years has taken a number of actions to arrest and reverse the decline in the U.S. technological and qualitative edge.[78]

China's Naval Modernization Effort

Observers of Chinese and U.S. military forces view China's improving naval capabilities as posing a potential challenge in the Western Pacific to the U.S. Navy's ability to achieve and maintain control of blue-water ocean areas in wartime—the first such challenge the U.S. Navy has faced since the end of the Cold War.[79] More broadly, these observers view China's naval

[76] See CRS Report R44891, *U.S. Role in the World: Background and Issues for Congress*, by Ronald O'Rourke and Michael Moodie.

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

[78] For additional discussion, see CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

[79] The term "blue-water ocean areas" is used here to mean waters that are away from shore, as opposed to near-shore

capabilities as a key element of an emerging broader Chinese military challenge to the long-standing status of the United States as the leading military power in the Western Pacific.

Constraints on Defense Spending

Constraints on defense spending, combined with some of the considerations above, have led to discussions among observers about how to balance competing demands for finite U.S. defense funds, and about whether programs for responding to China's military modernization effort can be adequately funded while also adequately funding other defense-spending priorities, such as initiatives for responding to Russia's actions in Ukraine and elsewhere in Europe and U.S. operations for countering challenges to U.S. interests in the Middle East.

(i.e., littoral) waters. Iran is viewed as posing a challenge to the U.S. Navy's ability to quickly achieve and maintain sea control in littoral waters in and near the Strait of Hormuz.

Appendix B. 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 B-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 September 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[i]	0[i]	0[i]	0[i]	0[i]	12[i]	14[i]	20[i]	0[i]	0[i]
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**

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

Notes: QDR is 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 C. 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,[80] and as of April 29, 2020, included a total of 299 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 April 2020 fleet is intended to meet a considerably different set of mission requirements centered on countering China's improving naval capabilities. In addition, the Navy of FY1987 differed substantially from the April 2020 fleet in areas such as profusion of precision-guided air-delivered weapons, numbers of Tomahawk-capable ships, and the sophistication of C4ISR systems and networking capabilities.[81]

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 or electromagnetic rail guns.

The 568-ship fleet of FY1987 may or may not have been capable of performing its stated missions; the 299-ship fleet of April 2020 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 three issues are to a substantial degree independent of one another.

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

[80] 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.

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

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 290-ship Navy of September 2019 was appropriately sized for meeting the mission requirements of 2019, even though there were differences of opinion among observers on that question, simply because a figure of 290 ships appears in the historical records for 2019, 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 H-1**.

Previous Navy force structure plans, such as those shown in **Table B-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 B-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]

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 D. Industrial Base and Employment Aspects of Additional Shipbuilding Work

This appendix presents background information on the ability of the industrial base to take on the additional shipbuilding work associated with achieving and maintaining the Navy's 355-ship force-level goal and on the employment impact of additional shipbuilding work.

Industrial Base Ability

The U.S. shipbuilding industrial base has some unused capacity to take on increased Navy shipbuilding work, particularly for certain kinds of surface ships, and its capacity could be increased further over time to support higher Navy shipbuilding rates. Navy shipbuilding rates could not be increased steeply across the board overnight—time (and investment) would be needed to hire and train additional workers and increase production facilities at shipyards and supplier firms, particularly for supporting higher rates of submarine production. Depending on their specialties, newly hired workers could be initially less productive per unit of time worked than more experienced workers.

Some parts of the shipbuilding industrial base, such as the submarine construction industrial base, could face more challenges than others in ramping up to the higher production rates required to build the various parts of the 355-ship fleet. Over a period of a few to several years, with investment and management attention, Navy shipbuilding could ramp up to higher rates for achieving a 355-ship fleet over a period of 20-30 years.

An April 2017 CBO report stated that

> all seven shipyards [currently involved in building the Navy's major ships] would need to increase their workforces and several would need to make improvements to their infrastructure in order to build ships at a faster rate. However, certain sectors face greater obstacles in constructing ships at faster rates than others: Building more submarines to meet the goals of the 2016 force structure assessment would pose the greatest challenge to the shipbuilding industry. Increasing the number of aircraft carriers and surface combatants would pose a small to moderate challenge to builders of those vessels. Finally, building more amphibious ships and combat logistics and support ships would be the least problematic for the shipyards. The workforces across those yards would need to increase by about 40 percent over the next 5 to 10 years. Managing the growth and training of those new workforces while maintaining the current standard of quality and efficiency would represent the most significant industrywide challenge. In addition, industry and Navy sources indicate that as much as $4 billion would need to be invested in the physical infrastructure of the shipyards to achieve the higher production rates required under the [notional] 15-year and 20-year [buildup scenarios examined by CBO]. Less investment would be needed for the [notional] 25-year or 30-year [buildup scenarios examined by CBO].[83]

A January 13, 2017, press report states the following:

> The Navy's production lines are hot and the work to prepare them for the possibility of building out a much larger fleet would be manageable, the service's head of acquisition said Thursday.
>
> From a logistics perspective, building the fleet from its current 274 ships to 355, as recommended in the Navy's newest force structure assessment in December, would be

[83] Congressional Budget Office, *Costs of Building a 355-Ship Navy*, April 2017, pp. 9-10.

> straightforward, Assistant Secretary of the Navy for Research, Development and Acquisition Sean Stackley told reporters at the Surface Navy Association's annual symposium.
>
> "By virtue of maintaining these hot production lines, frankly, over the last eight years, our facilities are in pretty good shape," Stackley said. "In fact, if you talked to industry, they would say we're underutilizing the facilities that we have."
>
> The areas where the Navy would likely have to adjust "tooling" to answer demand for a larger fleet would likely be in Virginia-class attack submarines and large surface combatants, the DDG-51 guided missile destroyers—two ship classes likely to surge if the Navy gets funding to build to 355 ships, he said.
>
> "Industry's going to have to go out and procure special tooling associated with going from current production rates to a higher rate, but I would say that's easily done," he said.
>
> Another key, Stackley said, is maintaining skilled workers—both the builders in the yards and the critical supply-chain vendors who provide major equipment needed for ship construction. And, he suggested, it would help to avoid budget cuts and other events that would force workforce layoffs.
>
> "We're already prepared to ramp up," he said. "In certain cases, that means not laying off the skilled workforce we want to retain."[84]

A January 17, 2017, press report states the following:

> Building stable designs with active production lines is central to the Navy's plan to grow to 355 ships. "if you look at the 355-ship number, and you study the ship classes (desired), the big surge is in attack submarines and large surface combatants, which today are DDG-51 (destroyers)," the Assistant Secretary of the Navy, Sean Stackley, told reporters at last week's Surface Navy Association conference. Those programs have proven themselves reliable performers both at sea and in the shipyards.
>
> From today's fleet of 274 ships, "we're on an irreversible path to 308 by 2021. Those ships are already in construction," said Stackley. "To go from there to 355, virtually all those ships are currently in production, with some exceptions: Ohio Replacement, (we) just got done the Milestone B there (to move from R&D into detailed design); and then upgrades to existing platforms. So we have hot production lines that will take us to that 355-ship Navy."[85]

A January 24, 2017, press report states the following:

> Navy officials say a recently determined plan to increase its fleet size by adding more new submarines, carriers and destroyers is "executable" and that early conceptual work toward this end is already underway....
>
> Although various benchmarks will need to be reached in order for this new plan to come to fruition, such as Congressional budget allocations, Navy officials do tell Scout Warrior that the service is already working—at least in concept—on plans to vastly enlarge the fleet. Findings from this study are expected to inform an upcoming 2018 Navy Shipbuilding Plan, service officials said.[86]

A January 12, 2017, press report states the following:

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[84] Hope Hodge Seck, "Navy Acquisition Chief: Surge to 355 Ships 'Easily Done,'" *DoD Buzz*, January 13, 2017.

[85] Sydney J. Freedberg Jr., "Build More Ships, But Not New Designs: CNO Richardson To McCain," *Breaking Defense*, January 17, 2017.

[86] Kris Osborn, "Navy: Larger 355-Ship Fleet—'Executable,'" *Scout Warrior*, January 24, 2017.

> Brian Cuccias, president of Ingalls Shipbuilding [a shipyard owned by Huntington Ingalls Industries (HII) that builds Navy destroyers and amphibious ships as well as Coast Guard cutters], said Ingalls, which is currently building 10 ships for four Navy and Coast Guard programs at its 800-acre facility in Pascagoula, Miss., could build more because it is using only 70 to 75 percent of its capacity.[87]

A March 2017 press report states the following:

> As the Navy calls for a larger fleet, shipbuilders are looking toward new contracts and ramping up their yards to full capacity....
>
> The Navy is confident that U.S. shipbuilders will be able to meet an increased demand, said Ray Mabus, then-secretary of the Navy, during a speech at the Surface Navy Association's annual conference in Arlington, Virginia.
>
> They have the capacity to "get there because of the ships we are building today," Mabus said. "I don't think we could have seven years ago."
>
> Shipbuilders around the United States have "hot" production lines and are manufacturing vessels on multi-year or block buy contracts, he added. The yards have made investments in infrastructure and in the training of their workers.
>
> "We now have the basis ... [to] get to that much larger fleet," he said....
>
> Shipbuilders have said they are prepared for more work.
>
> At Ingalls Shipbuilding—a subsidiary of Huntington Ingalls Industries—10 ships are under construction at its Pascagoula, Mississippi, yard, but it is under capacity, said Brian Cuccias, the company's president.
>
> The shipbuilder is currently constructing five guided-missile destroyers, the latest San Antonio-class amphibious transport dock ship, and two national security cutters for the Coast Guard.
>
> "Ingalls is a very successful production line right now, but it has the ability to actually produce a lot more in the future," he said during a briefing with reporters in January.
>
> The company's facility is currently operating at 75 percent capacity, he noted....
>
> Austal USA—the builder of the Independence-variant of the littoral combat ship and the expeditionary fast transport vessel—is also ready to increase its capacity should the Navy require it, said Craig Perciavalle, the company's president.
>
> The latest discussions are "certainly something that a shipbuilder wants to hear," he said. "We do have the capability of increasing throughput if the need and demand were to arise, and then we also have the ability with the present workforce and facility to meet a different mix that could arise as well."
>
> Austal could build fewer expeditionary fast transport vessels and more littoral combat ships, or vice versa, he added.
>
> "The key thing for us is to keep the manufacturing lines hot and really leverage the momentum that we've gained on both of the programs," he said.
>
> The company—which has a 164-acre yard in Mobile, Alabama—is focused on the extension of the LCS and expeditionary fast transport ship program, but Perciavalle noted that it could look into manufacturing other types of vessels.

[87] Marc Selinger, "Navy Needs More Aircraft to Match Ship Increase, Secretary [of the Navy] Says," *Defense Daily*, January 12, 2017. See also Lee Hudson, "Ingalls Operating at About 75 Percent Capacity, Provided Info to Trump Team," *Inside the Navy*, January 16, 2017.

> "We do have excess capacity to even build smaller vessels … if that opportunity were to arise and we're pursuing that," he said.
>
> Bryan Clark, a naval analyst at the Center for Strategic and Budgetary Assessments, a Washington, D.C.-based think tank, said shipbuilders are on average running between 70 and 80 percent capacity. While they may be ready to meet an increased demand for ships, it would take time to ramp up their workforces.
>
> However, the bigger challenge is the supplier industrial base, he said.
>
> "Shipyards may be able to build ships but the supplier base that builds the pumps … and the radars and the radios and all those other things, they don't necessarily have that ability to ramp up," he said. "You would need to put some money into building up their capacity."
>
> That has to happen now, he added.
>
> Rear Adm. William Gallinis, program manager for program executive office ships, said what the Navy must be "mindful of is probably our vendor base that support the shipyards."
>
> Smaller companies that supply power electronics and switchboards could be challenged, he said.
>
> "Do we need to re-sequence some of the funding to provide some of the facility improvements for some of the vendors that may be challenged? My sense is that the industrial base will size to the demand signal. We just need to be mindful of how we transition to that increased demand signal," he said.
>
> The acquisition workforce may also see an increased amount of stress, Gallinis noted. "It takes a fair amount of experience and training to get a good contracting officer to the point to be [able to] manage contracts or procure contracts."
>
> "But I don't see anything that is insurmountable," he added.[88]

At a May 24, 2017, hearing before the Seapower subcommittee of the Senate Armed Services Committee on the industrial-base aspects of the Navy's 355-ship goal, John P. Casey, executive vice president–marine systems, General Dynamics Corporation (one of the country's two principal builders of Navy ships) stated the following:

> It is our belief that the Nation's shipbuilding industrial base can scale-up hot production lines for existing ships and mobilize additional resources to accomplish the significant challenge of achieving the 355-ship Navy as quickly as possible....
>
> Supporting a plan to achieve a 355-ship Navy will be the most challenging for the nuclear submarine enterprise. Much of the shipyard and industrial base capacity was eliminated following the steep drop-off in submarine production that occurred with the cancellation of the Seawolf Program in 1992. The entire submarine industrial base at all levels of the supply chain will likely need to recapitalize some portion of its facilities, workforce, and supply chain just to support the current plan to build the Columbia Class SSBN program, while concurrently building Virginia Class SSNs. Additional SSN procurement will require industry to expand its plans and associated investment beyond the level today....
>
> Shipyard labor resources include the skilled trades needed to fabricate, build and outfit major modules, perform assembly, test and launch of submarines, and associated support organizations that include planning, material procurement, inspection, quality assurance, and ship certification. Since there is no commercial equivalency for Naval nuclear submarine shipbuilding, these trade resources cannot be easily acquired in large numbers from other industries. Rather, these shipyard resources must be acquired and developed over time to ensure the unique knowledge and know-how associated with nuclear

[88] Yasmin Tadjdeh, "Navy Shipbuilders Prepared for Proposed Fleet Buildup," *National Defense*, March 2017.

submarine shipbuilding is passed on to the next generation of shipbuilders. The mechanisms of knowledge transfer require sufficient lead time to create the proficient, skilled craftsmen in each key trade including welding, electrical, machining, shipfitting, pipe welding, painting, and carpentry, which are among the largest trades that would need to grow to support increased demand. These trades will need to be hired in the numbers required to support the increased workload. Both shipyards have scalable processes in place to acquire, train, and develop the skilled workforce they need to build nuclear ships. These processes and associated training facilities need to be expanded to support the increased demand. As with the shipyards, the same limiting factors associated with facilities, workforce, and supply chain also limit the submarine unique first tier suppliers and sub-tiers in the industrial base for which there is no commercial equivalency....

The supply base is the third resource that will need to be expanded to meet the increased demand over the next 20 years. During the OHIO, 688 and SEAWOLF construction programs, there were over 17,000 suppliers supporting submarine construction programs. That resource base was "rationalized" during submarine low rate production over the last 20 years. The current submarine industrial base reflects about 5,000 suppliers, of which about 3,000 are currently active (i.e., orders placed within the last 5 years), 80% of which are single or sole source (based on $). It will take roughly 20 years to build the 12 Columbia Class submarines that starts construction in FY21. The shipyards are expanding strategic sourcing of appropriate non-core products (e.g., decks, tanks, etc.) in order to focus on core work at each shipyard facility (e.g., module outfitting and assembly). Strategic sourcing will move demand into the supply base where capacity may exist or where it can be developed more easily. This approach could offer the potential for cost savings by competition or shifting work to lower cost work centers throughout the country. Each shipyard has a process to assess their current supply base capacity and capability and to determine where it would be most advantageous to perform work in the supply base....

Achieving the increased rate of production and reducing the cost of submarines will require the Shipbuilders to rely on the supply base for more non-core products such as structural fabrication, sheet metal, machining, electrical, and standard parts. The supply base must be made ready to execute work with submarine-specific requirements at a rate and volume that they are not currently prepared to perform. Preparing the supply base to execute increased demand requires early non-recurring funding to support cross-program construction readiness and EOQ funding to procure material in a manner that does not hold up existing ship construction schedules should problems arise in supplier qualification programs. This requires longer lead times (estimates of three years to create a new qualified, critical supplier) than the current funding profile supports....

We need to rely on market principles to allow suppliers, the shipyards and GFE material providers to sort through the complicated demand equation across the multiple ship programs. Supplier development funding previously mentioned would support non-recurring efforts which are needed to place increased orders for material in multiple market spaces. Examples would include valves, build-to-print fabrication work, commodities, specialty material, engineering components, etc. We are engaging our marine industry associations to help foster innovative approaches that could reduce costs and gain efficiency for this increased volume....

Supporting the 355-ship Navy will require Industry to add capability and capacity across the entire Navy Shipbuilding value chain. Industry will need to make investment decisions for additional capital spend starting now in order to meet a step change in demand that would begin in FY19 or FY20. For the submarine enterprise, the step change was already envisioned and investment plans that embraced a growth trajectory were already being formulated. Increasing demand by adding additional submarines will require scaling facility and workforce development plans to operate at a higher rate of production. The nuclear shipyards would also look to increase material procurement proportionally to the increased demand. In some cases, the shipyard facilities may be constrained with existing

capacity and may look to source additional work in the supply base where capacity exists or where there are competitive business advantages to be realized. Creating additional capacity in the supply base will require non-recurring investment in supplier qualification, facilities, capital equipment and workforce training and development.

Industry is more likely to increase investment in new capability and capacity if there is certainty that the Navy will proceed with a stable shipbuilding plan. Positive signals of commitment from the Government must go beyond a published 30-year Navy Shipbuilding Plan and line items in the Future Years Defense Plan (FYDP) and should include

- Multi-year contracting for Block procurement which provides stability in the industrial base and encourages investment in facilities and workforce development
- Funding for supplier development to support training, qualification, and facilitization efforts—Electric Boat and Newport News have recommended to the Navy funding of $400M over a three-year period starting in 2018 to support supplier development for the Submarine Industrial Base as part of an Integrated Enterprise Plan Extended Enterprise initiative
- Acceleration of Advance Procurement and/or Economic Order Quantities (EOQ) procurement from FY19 to FY18 for Virginia Block V
- Government incentives for construction readiness and facilities / special tooling for shipyard and supplier facilities, which help cash flow capital investment ahead of construction contract awards
- Procurement of additional production back-up (PBU) material to help ensure a ready supply of material to mitigate construction schedule risk....

So far, this testimony has focused on the Submarine Industrial Base, but the General Dynamics Marine Systems portfolio also includes surface ship construction. Unlike Electric Boat, Bath Iron Works and NASSCO are able to support increased demand without a significant increase in resources.....

Bath Iron Works is well positioned to support the Administration's announced goal of increasing the size of the Navy fleet to 355 ships. For BIW that would mean increasing the total current procurement rate of two DDG 51s per year to as many as four DDGs per year, allocated equally between BIW and HII. This is the same rate that the surface combatant industrial base sustained over the first decade of full rate production of the DDG 51 Class (1989-1999)....

No significant capital investment in new facilities is required to accommodate delivering two DDGs per year. However, additional funding will be required to train future shipbuilders and maintain equipment. Current hiring and training processes support the projected need, and have proven to be successful in the recent past. BIW has invested significantly in its training programs since 2014 with the restart of the DDG 51 program and given these investments and the current market in Maine, there is little concern of meeting the increase in resources required under the projected plans.

A predictable and sustainable Navy workload is essential to justify expanding hiring/training programs. BIW would need the Navy's commitment that the Navy's plan will not change before it would proceed with additional hiring and training to support increased production.

BIW's supply chain is prepared to support a procurement rate increase of up to four DDG 51s per year for the DDG 51 Program. BIW has long-term purchasing agreements in place for all major equipment and material for the DDG 51 Program. These agreements provide for material lead time and pricing, and are not constrained by the number of ships ordered

> in a year. BIW confirmed with all of its critical suppliers that they can support this increased procurement rate....
>
> The Navy's Force Structure Assessment calls for three additional ESBs. Additionally, NASSCO has been asked by the Navy and the Congressional Budget Office (CBO) to evaluate its ability to increase the production rate of T-AOs to two ships per year. NASSCO has the capacity to build three more ESBs at a rate of one ship per year while building two T-AOs per year. The most cost effective funding profile requires funding ESB 6 in FY18 and the following ships in subsequent fiscal years to avoid increased cost resulting from a break in the production line. The most cost effective funding profile to enable a production rate of two T-AO ships per year requires funding an additional long lead time equipment set beginning in FY19 and an additional ship each year beginning in FY20.
>
> NASSCO must now reduce its employment levels due to completion of a series of commercial programs which resulted in the delivery of six ships in 2016. The proposed increase in Navy shipbuilding stabilizes NASSCO's workload and workforce to levels that were readily demonstrated over the last several years.
>
> Some moderate investment in the NASSCO shipyard will be needed to reach this level of production. The recent CBO report on the costs of building a 355-ship Navy accurately summarized NASSCO's ability to reach the above production rate stating, "building more … combat logistics and support ships would be the least problematic for the shipyards."[89]

At the same hearing, Brian Cuccias, president, Ingalls Shipbuilding, Huntington Ingalls Industries (the country's other principal builder of Navy ships) stated the following:

> Qualifying to be a supplier is a difficult process. Depending on the commodity, it may take up to 36 months. That is a big burden on some of these small businesses. This is why creating sufficient volume and exercising early contractual authorization and advance procurement funding is necessary to grow the supplier base, and not just for traditional long-lead time components; that effort needs to expand to critical components and commodities that today are controlling the build rate of submarines and carriers alike. Many of our suppliers are small businesses and can only make decisions to invest in people, plant and tooling when they are awarded a purchase order. We need to consider how we can make commitments to suppliers early enough to ensure material readiness and availability when construction schedules demand it.
>
> With questions about the industry's ability to support an increase in shipbuilding, both Newport News and Ingalls have undertaken an extensive inventory of our suppliers and assessed their ability to ramp up their capacity. We have engaged many of our key suppliers to assess their ability to respond to an increase in production.
>
> The fortunes of related industries also impact our suppliers, and an increase in demand from the oil and gas industry may stretch our supply base. Although some low to moderate risk remains, I am convinced that our suppliers will be able to meet the forecasted Navy demand....
>
> I strongly believe that the fastest results can come from leveraging successful platforms on current hot production lines. We commend the Navy's decision in 2014 to use the existing LPD 17 hull form for the LX(R), which will replace the LSD-class amphibious dock landing ships scheduled to retire in the coming years. However, we also recommend that the concept of commonality be taken even further to best optimize efficiency, affordability and capability. Specifically, rather than continuing with a new design for LX(R) within the "walls" of the LPD hull, we can leverage our hot production line and supply chain and

[89] John P. Casey, Executive Vice President – Marine Systems, General Dynamics Corporation, Testimony before the Senate Armed Services Committee, Subcommittee on Seapower, 115th Congress, Supporting the 355-Ship Navy with Focus on Submarine Industrial Base, Washington, DC, May 24, 2017, pp. 3-18. See also Marjorie Censer, "BWX Technologies Weighs When To Ready for Additional Submarines," *Inside the Navy*, May 29, 2017.

> offer the Navy a variant of the existing LPD design that satisfies the aggressive cost targets of the LX(R) program while delivering more capability and survivability to the fleet at a significantly faster pace than the current program. As much as 10-15 percent material savings can be realized across the LX(R) program by purchasing respective blocks of at least five ships each under a multi-year procurement (MYP) approach. In the aggregate, continuing production with LPD 30 in FY18, coupled with successive MYP contracts for the balance of ships, may yield savings greater than $1 billion across an 11-ship LX(R) program. Additionally, we can deliver five LX(R)s to the Navy and Marine Corps in the same timeframe that the current plan would deliver two, helping to reduce the shortfall in amphibious warships against the stated force requirement of 38 ships.
>
> Multi-ship procurements, whether a formal MYP or a block-buy, are a proven way to reduce the price of ships. The Navy took advantage of these tools on both Virginia-class submarines and Arleigh Burke-class destroyers. In addition to the LX(R) program mentioned above, expanding multi-ship procurements to other ship classes makes sense....
>
> The most efficient approach to lower the cost of the Ford class and meet the goal of an increased CVN fleet size is also to employ a multi-ship procurement strategy and construct these ships at three-year intervals. This approach would maximize the material procurement savings benefit through economic order quantities procurement and provide labor efficiencies to enable rapid acquisition of a 12-ship CVN fleet. This three-ship approach would save at least $1.5 billion, not including additional savings that could be achieved from government-furnished equipment. As part of its Integrated Enterprise Plan, we commend the Navy's efforts to explore the prospect of material economic order quantity purchasing across carrier and submarine programs.[90]

At the same hearing, Matthew O. Paxton, president, Shipbuilders Council of America (SCA)—a trade association representing shipbuilders, suppliers, and associated firms—stated the following:

> To increase the Navy's Fleet to 355 ships, a substantial and sustained investment is required in both procurement and readiness. However, let me be clear: building and sustaining the larger required Fleet is achievable and our industry stands ready to help achieve that important national security objective.
>
> To meet the demand for increased vessel construction while sustaining the vessels we currently have will require U.S. shipyards to expand their work forces and improve their infrastructure in varying degrees depending on ship type and ship mix – a requirement our Nation's shipyards are eager to meet. But first, in order to build these ships in as timely and affordable manner as possible, stable and robust funding is necessary to sustain those industrial capabilities which support Navy shipbuilding and ship maintenance and modernization....
>
> Beyond providing for the building of a 355-ship Navy, there must also be provision to fund the "tail," the maintenance of the current and new ships entering the fleet. Target fleet size cannot be reached if existing ships are not maintained to their full service lives, while building those new ships. Maintenance has been deferred in the last few years because of across-the-board budget cuts....
>
> The domestic shipyard industry certainly has the capability and know-how to build and maintain a 355-ship Navy. The Maritime Administration determined in a recent study on the Economic Benefits of the U.S. Shipyard Industry that there are nearly 110,000 skilled men and women in the Nation's private shipyards building, repairing and maintaining America's military and commercial fleets.1 The report found the U.S. shipbuilding industry supports nearly 400,000 jobs across the country and generates $25.1 billion in income and $37.3 billion worth of goods and services each year. In fact, the MARAD

[90] Statement of Brian Cuccias, President, Ingalls Shipbuilding, Huntington Ingalls Industries, Subcommittee on Seapower, Senate Armed Services Committee, May 24, 2017, pp. 4-11.

> report found that the shipyard industry creates direct and induced employment in every State and Congressional District and each job in the private shipbuilding and repairing industry supports another 2.6 jobs nationally.
>
> This data confirms the significant economic impact of this manufacturing sector, but also that the skilled workforce and industrial base exists domestically to build these ships. Long-term, there needs to be a workforce expansion and some shipyards will need to reconfigure or expand production lines. This can and will be done as required to meet the need if adequate, stable budgets and procurement plans are established and sustained for the long-term. Funding predictability and sustainability will allow industry to invest in facilities and more effectively grow its skilled workforce. The development of that critical workforce will take time and a concerted effort in a partnership between industry and the federal government.
>
> U.S. shipyards pride themselves on implementing state of the art training and apprenticeship programs to develop skilled men and women that can cut, weld, and bend steel and aluminum and who can design, build and maintain the best Navy in the world. However, the shipbuilding industry, like so many other manufacturing sectors, faces an aging workforce. Attracting and retaining the next generation shipyard worker for an industry career is critical. Working together with the Navy, and local and state resources, our association is committed to building a robust training and development pipeline for skilled shipyard workers. In addition to repealing sequestration and stabilizing funding the continued development of a skilled workforce also needs to be included in our national maritime strategy....
>
> In conclusion, the U.S. shipyard industry is certainly up to the task of building a 355-ship Navy and has the expertise, the capability, the critical capacity and the unmatched skilled workforce to build these national assets. Meeting the Navy's goal of a 355-ship fleet and securing America's naval dominance for the decades ahead will require sustained investment by Congress and Navy's partnership with a defense industrial base that can further attract and retain a highly-skilled workforce with critical skill sets. Again, I would like to thank this Subcommittee for inviting me to testify alongside such distinguished witnesses. As a representative of our nation's private shipyards, I can say, with confidence and certainty, that our domestic shipyards and skilled workers are ready, willing and able to build and maintain the Navy's 355-ship Fleet.[91]

Employment Impact

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 2015 Maritime Administration (MARAD) report states

> Considering the indirect and induced impacts, each direct job in the shipbuilding and repairing industry is associated with another 2.6 jobs in other parts of the US economy; each dollar of direct labor income and GDP in the shipbuilding and repairing industry is associated with another $1.74 in labor income and $2.49 in GDP, respectively, in other parts of the US economy.[92]

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[91] Testimony of Matthew O. Paxton, President, Shipbuilders Council of America, before the United States Senate Committee on Armed Services, Subcommittee on Seapower, [on] Industry Perspectives on Options and Considerations for Achieving a 355-Ship Navy, May 24, 2017, pp. 3-8.

[92] MARAD, *The Economic Importance of the U.S. Shipbuilding and Repairing Industry*, November 2015, pp. E-3, E-4. For another perspective on the issue of the impact of shipbuilding on the broader economy, see Edward G. Keating et al., *The Economic Consequences of Investing in Shipbuilding, Case Studies in the United States and Sweden*, RAND

A March 2017 press report states, "Based on a 2015 economic impact study, the Shipbuilders Council of America [a trade association for U.S. shipbuilders and associated supplier firms] believes that a 355-ship Navy could add more than 50,000 jobs nationwide."[93] The 2015 economic impact study referred to in that quote might be the 2015 MARAD study discussed in the previous paragraph. An estimate of more than 50,000 additional jobs nationwide might be viewed as a higher-end estimate; other estimates might be lower. A June 14, 2017, press report states the following: "The shipbuilding industry will need to add between 18,000 and 25,000 jobs to build to a 350-ship Navy, according to Matthew Paxton, president of the Shipbuilders Council of America, a trade association representing the shipbuilding industrial base. Including indirect jobs like suppliers, the ramp-up may require a boost of 50,000 workers."[94]

Corporation, 2015.

[93] Yasmin Tadjdeh, "Navy Shipbuilders Prepared for Proposed Fleet Buildup," *National Defense*, March 2017. Similarly, another press report states the following: "The Navy envisioned by Trump could create more than 50,000 jobs, the Shipbuilders Council of America, a trade group representing U.S. shipbuilders, repairers and suppliers, told Reuters." (Mike Stone, "Missing from Trump's Grand Navy Plan: Skilled Workers to Build the Fleet," *Reuters*, March 17, 2017.)

[94] Jaqueline Klimas, "Growing Shipbuilding Workforce Seen as Major Challenge for Trump's Navy Buildup," *Politico*, June 14, 2017.

Appendix E. 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.
- **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 F. 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."[95]

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.[96]

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[95] 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.

[96] It can also be noted that the country's two largest builders of Navy ships—General Dynamics (GD) and Huntington Ingalls Industries (HII)—derive about 60% and 96%, respectively, of their revenues from U.S. government work. (See General Dynamics, *2016 Annual Report*, page 9 of Form 10-K [PDF page 15 of 88]) and Huntington Ingalls Industries,

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.[97]

2016 Annual Report, page 5 of Form 10-K [PDF page 19 of 134]). These two shipbuilders operate the only U.S. shipyards currently capable of building several major types of Navy ships, including submarines, aircraft 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.

[97] 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 G. 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 H. Size of the Navy and Navy Shipbuilding Rate

Size of the Navy

Table H-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.[98] The Navy fell below 300 battle force ships in August 2003 and as of April 29, 2020, included 299 battle force ships.

As discussed in **Appendix C**, 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.

[98] 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 H-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	373	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		
1955	1,030	1977	464	1999	317		
1956	973	1978	468	2000	318		
1957	967	1979	471	2001	316		
1958	890	1980	477	2002	313		
1959	860	1981	490	2003	297		
1960	812	1982	513	2004	291		
1961	897	1983	514	2005	282		
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	547	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 H-2 shows past (FY1982-FY2019) and requested or programmed (FY2020-FY2024) rates of Navy ship procurement.

Table H-2. Battle Force Ships Procured or Requested, FY1982-FY2024

(Procured in FY1982-FY2019; *requested for FY2020, and programmed for FY2021-FY2024*)

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***													
13	*7*	*7*	*8*	*11*	*9*													

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 nonbattle force ships that do not count toward the 355-ship 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.

Appendix I. Procurement Dates of CVN-81, LPD-31, and LHA-9

This appendix presents background information on congressional action regarding the procurement dates of three ships—the aircraft carrier CVN-81, the LPD-17 Flight II amphibious ship LPD-31, and the amphibious assault ship LHA-9. In reviewing the bullet points presented below, it can be noted that procurement funding is funding for a ship that is either being procured in that fiscal year or has been procured in a prior fiscal year, while advance procurement (AP) funding is funding for a ship that is to be procured in a future fiscal year.[99]

CVN-81 Aircraft Carrier

The Navy's FY2020 budget submission presented the aircraft carrier CVN-81 as a ship requested for procurement in FY2020, and the Navy's FY2021 budget submission presents CVN-81 as a ship that Congress procured in FY2020. Consistent with congressional action on the Navy's FY2019 budget regarding the procurement of CVN-81, this CRS report treats CVN-81 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2019. Discussion in this CRS report of the Navy's FY2021 budget submission is adjusted to show CVN-81 as a ship that was procured in FY2019. This CRS report treats CVN-81 as a ship that Congress procured in FY2019 consistent with the following:

- Within Section 121 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (H.R. 5515/P.L. 115-232 of August 13, 2018)—the provision that authorized a two-ship block buy contract for CVN-80 and CVN-81—subsection (a)(1) specifically authorizes a contract for the procurement of CVN-81 "beginning with the fiscal year 2019 program year." The header for subsection (a)(1) is "Procurement Authorized."
- Consistent with Section 121(a)(1), the funding table for the Navy's shipbuilding account in the conference report (H.Rept. 115-874 of July 25, 2018) on H.R. 5515 shows a quantity of "1" in line 002 of the FY2019 SCN (Shipbuilding and Conversion, Navy) appropriation account. Line 002 is the line item for procurement (not advance procurement [AP]) funding for the CVN-78 program. A notation in the table for line 002 states that the procurement funding authorized for this line item is for "Authorize CVN81—One ship."[100] The funding table does not authorize any funding for line 003 of the FY2019 SCN account—the line item for AP funding for the CVN-78 program. (AP funding is funding for the procurement of a ship to be procured in a future fiscal year.)
- Consistent with the two above points, the paragraph in the FY2019 DOD appropriations act (Division A of H.R. 6157/P.L. 115-245 of September 28, 2018) that makes appropriations for the SCN account makes procurement (not AP) appropriations for the CVN-78 program. This paragraph also states that "the funds made available by this Act for the Carrier Replacement Program (CVN-80) may be available to modify or enter into a new contract for the procurement of a

[99] For additional discussion, see CRS Report RL31404, *Defense Procurement: Full Funding Policy—Background, Issues, and Options for Congress*, by Ronald O'Rourke and Stephen Daggett.

[100] H.Rept. 115-874, p. 1164.

Ford-class aircraft carrier designated CVN–81 pursuant to section 121 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019."

- Consistent with this bill language, the funding table for the SCN account in the joint explanatory statement for H.R. 6157 shows that this funding was provided for line 2 of the FY2019 SCN account (CVN-78 program procurement funding), not line 3 of the FY2019 SCN account (CVN-78 program AP funding).[101]
- Consistent with all of the above points, the Navy's FY2020 budget submission shows the $618 million in FY2019 funding for CVN-81 as full funding (meaning funding for a procured ship), rather than AP funding (meaning funding for a ship to be procured in a future fiscal year).[102]
- The House Armed Services Committee's report (H.Rept. 116-120 of June 19, 2019) on H.R. 2500, the FY2020 National Defense Authorization Act, recommended authorizing the procurement of no aircraft carrier in FY2020 due to "CVN–81 previously authorized."[103]
- The Senate Armed Services Committee's report (S.Rept. 116-48 of June 11, 2019) on S. 1790, the FY2020 National Defense Authorization Act, recommended authorizing the procurement of no aircraft carrier in FY2020 due to "CVN-81 authorized in NDAA [FY]2019."[104]
- The conference report (H.Rept. 116-333 of December 9, 2019) on S. 1790/P.L. 116-92 of December 20, 2019, the FY2020 National Defense Authorization Act, authorized the procurement of no aircraft carrier in FY2020 due to "CVN–81 previously authorized."[105]
- The House Appropriations Committee's report (H.Rept. 116-84 of May 23, 2019) on H.R. 2968, the FY2020 DOD Appropriations Act, adjusted the Navy's FY2020 budget submission to show that no aircraft carrier was being requested for procurement in FY2020.[106]
- The Senate Appropriations Committee's report (S.Rept. 116-103 of September 12, 2019) on S. 2474, the FY2020 DOD Appropriations Act, adjusted the Navy's FY2020 budget submission to show that no aircraft carrier was being requested for procurement in FY2020.[107]

LPD-31—an LPD-17 Flight II Amphibious Ship

The Navy's FY2021 budget submission presents LPD-31, an LPD-17 Flight II amphibious ship, as a ship requested for procurement in FY2021. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LPD-31, this CRS report treats LPD-31 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2020. Discussion in this CRS report of the Navy's FY2021 budget submission is adjusted to show LPD-

[101] Joint explanatory statement for H.R. 6157, PDF pages 174 and 176 of 559.

[102] *Department of Defense, Fiscal Year (FY) 2020 President's Budget Estimate Submission, Navy, Justification Book Volume 1 of 1, Shipbuilding and Conversion, Navy*, March 2019, p. 15 (PDF page 51 of 356).

[103] H.Rept. 116-120, p. 378, line 002.

[104] S.Rept. 116-48, p. 432, line 2.

[105] H.Rept. 116-333, p. 1565, line 002.

[106] H.Rept. 116-84, p. 173, line 2.

[107] S.Rept. 116-103, p. 118, line XX.

31 as a ship that was procured in FY2020. This CRS report treats LPD-31 as a ship that Congress procured in FY2020 consistent with the following:

- The House Armed Services Committee's report (H.Rept. 116-120 of June 19, 2019) on H.R. 2500, the FY2020 National Defense Authorization Act, recommended authorizing the procurement of an LPD-17 Flight II ship in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (not just AP) funding for the program.[108]
- The Senate Armed Services Committee's report (S.Rept. 116-48 of June 11, 2019) on S. 1790, the FY2020 National Defense Authorization Act, recommended authorizing the procurement of an LPD-17 Flight II ship in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[109]
- The conference report (H.Rept. 116-333 of December 9, 2019) on S. 1790/P.L. 116-92 of December 20, 2019, the FY2020 National Defense Authorization Act, authorized the procurement of an LPD-17 Flight II ship in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[110] Section 129 of S. 1790/P.L. 116-92 authorizes the Navy to enter into a contract, beginning in FY2020, for the procurement of LPD-31, and to use incremental funding to fund the contract.
- The Senate Appropriations Committee's report (S.Rept. 116-103 of September 12, 2019) on S. 2474, the FY2020 DOD Appropriations Act, recommended funding for the procurement of an LPD-17 Flight II ship in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[111]
- The final version of the FY2020 DOD Appropriations Act (Division A of H.R. 1158/P.L. 116-93 of December 20, 2019) provides procurement (not AP) funding for an LPD-17 Flight II ship. The paragraph in this act that appropriates funding for the Navy's shipbuilding account, including this ship, includes a provision stating "*Provided further*, That an appropriation made under the heading 'Shipbuilding and Conversion, Navy' provided for the purpose of 'Program increase—advance procurement for fiscal year 2020 LPD Flight II and/or multiyear procurement economic order quantity' shall be considered to be for the purpose of 'Program increase—advance procurement of LPD–31'." This provision relates to funding appropriated in the FY2019 DOD Appropriations Act (Division A of H.R. 6157/P.L. 115-245 of September 28, 2018) for the procurement of an LPD-17 Flight II ship in FY2020, as originally characterized in the explanatory statement accompanying that act.[112]

[108] H.Rept. 116-120, p. 379, line 012.

[109] S.Rept. 116-48, p. 433, line 12. See also pp. 23-24 for associated report language.

[110] H.Rept. 116-333, p. 1566, line 012. See also p. 1144 for associated report language.

[111] S.Rept. 116-103, p. 118, line 12. See also p. 122 for associated report language.

[112] See PDF page 176 of 559, line 12, of the explanatory statement for H.R. 6157/P.L. 115-245.

LHA-9 Amphibious Assault Ship

The Navy's FY2021 budget submission presents the amphibious assault ship LHA-9 as a ship projected for procurement in FY2023. Consistent with congressional action on the Navy's FY2020 budget regarding the procurement of LHA-9, this CRS report treats LHA-9 as a ship that Congress procured (i.e., authorized and provided procurement funding for) in FY2020. Discussion in this CRS report of the Navy's FY2021 budget submission is adjusted to show LHA-9 as a ship that was procured in FY2020. This CRS report treats LHA-9 as a ship that Congress procured in FY2020 consistent with the following:

- The Senate Armed Services Committee's report (S.Rept. 116-48 of June 11, 2019) on S. 1790, the FY2020 National Defense Authorization Act, recommended authorizing the procurement of LHA-9 in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[113]
- The conference report (H.Rept. 116-333 of December 9, 2019) on S. 1790/P.L. 116-92 of December 20, 2019, the FY2020 National Defense Authorization Act, authorized the procurement of LHA-9 in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[114] Section 127 of S. 1790/P.L. 116-92 authorizes the Navy to enter into a contract for the procurement of LHA-9 and to use incremental funding provided during the period FY2019-FY2025 to fund the contract.
- The Senate Appropriations Committee's report (S.Rept. 116-103 of September 12, 2019) on S. 2474, the FY2020 DOD Appropriations Act, recommended funding for the procurement of an LHA amphibious assault ship in FY2020, showing a quantity increase of one ship above the Navy's request and recommending procurement (rather than AP) funding for the program.[115]
- The final version of the FY2020 DOD Appropriations Act (Division A of H.R. 1158/P.L. 116-93 of December 20, 2019) provides procurement (not AP) funding for an LHA amphibious assault ship. The explanatory statement for Division A of H.R. 1158/P.L. 116-93 states that the funding is for LHA-9.[116]

[113] S.Rept. 116-48, p. 433, line 15.

[114] H.Rept. 116-333, p. 1566, line 015.

[115] S.Rept. 116-103, p. 118, line 15.

[116] Explanatory statement for Division A of H.R. 1158, PDF page 175 of 414, line 15.

Appendix J. Letters from Members of Congress Regarding COVID-19 (Coronavirus) Impact on Defense Industry and Workforce

This appendix presents the text of March 19 and March 27 letters from Members of Congress from Maine to DOD and the Navy regarding the impacts of the COVID-19 (coronavirus) situation on the large private-sector U.S. shipyards that build the Navy's major warships.

March 19, 2020, Letter

On March 19, 2020, Members of Congress from Maine sent a letter to the Secretary of Defense and the Acting Secretary of the Navy "about the stability of the defense industrial base as the whole nation combats the current novel coronavirus (COVID-19) outbreak." The text of the letter is as follows:

> We are deeply concerned about the stability of the defense industrial base as the whole nation combats the current novel coronavirus (COVID-19) outbreak. We are equally worried about the health and safety risks to the industrial bases' primary asset—its skilled workforce—as defense companies struggle to support our nation's military while also managing the unique challenge we face today.
>
> In Maine, workers at shipbuilder Bath Iron Works, as well as at other defense suppliers of all sizes, must now contend with significant health concerns at work while also arranging to care for their children who are now staying at home due to school closures. The strain and stress on our skilled workforce today are without recent precedent. Given these challenges, the Department of Defense and the Navy must immediately act to protect our nation's defense industrial base, including our nation's shipyards.
>
> First, we ask that you work to mitigate cash flow and other financial burdens that contractors and subcontractors may face during this time of crisis. This includes providing clear guidance and relief from contract requirements that are uniquely impacted by COVID-19. Additionally, we ask that you take any actions possible to accelerate or advance payments or new contract obligations in order to provide immediate stability to the industrial base. If additional funding or new legal authorities are required to provide such assistance to industry, we stand ready to immediately assist the Department.
>
> Finally, we ask that you clarify your planning and public guidance to ensure a stable industrial base while also ensuring the health and safety of the defense industrial base workforce. The safety of defense industry workers is paramount, and we are mindful that insufficiently mitigating the impact of COVID-19 now could lead to deeper impacts in later months or years if this pandemic continues for an extended period. An outbreak of COVID-19 at one of our nation's shipyards or other large defense contractors could truly be devastating to our national defense. We ask you to work with and support industry to take all necessary protective actions.
>
> Thank you for your attention to the important issue, and we look forward to your quick response.[117]

[117] Letter from Senator Susan M. Collins, Senator Angus S. King, Jr., Representative Chellie Pingree, and Representative Jared Golden to Secretary of Defense Mark Esper and Acting Secretary of the Navy Thomas B. Modly, dated March 19, 2020, accessed on April 1, 2020, at https://www.collins.senate.gov/sites/default/files/2020.03.19%20-%20ME%20Delegation%20letter%20to%20DOD%20and%20Navy%20re%20defense%20industrial%20base.pdf. For

March 27, 2020, Letter

On March 27, 2020, Members of Congress from Maine sent a follow-on letter to the Acting Secretary of the Navy expressing their concern about risks posed by the COVID-19 (coronavirus) situation to the Navy's shipyard defense industrial base workforce. The text of the letter is as follows:

> We appreciate the steps the Navy has recently taken to ensure the stability of the nation's defense industrial base, as well as your recent phone discussion with Senator Collins on this topic. The Department's many efforts to address the concerns of these vital industry partners will likely help many suppliers remain viable during this challenging time.
>
> As the novel coronavirus (COVID-19) spreads across our nation, however, we continue to be concerned about risks to the workforce that sustains the Navy's shipyard defense industrial base. In many states, such as Maine, Governors have issued orders mandating the closure of all nonessential businesses and placed restrictions on public gatherings due to the current risks to public health and safety of the deadly virus.
>
> In response to this pandemic, the Navy earlier issued direction to each of its four public shipyards intended to limit the potential exposure of shipyard workers to COVID-19 while also maximizing the important national security work accomplished. This included the liberal use of telework, as well as permitting the most vulnerable workers to take paid administrative leave based on Centers for Disease Control (CDC) guidelines, such as older individuals or those who have preexisting health conditions, as well as those who have family members with preexisting health conditions.
>
> We urge you to provide similar guidelines to our nation's large private shipyards, the workers at which face similar health and safety concerns, and to permit necessary contract or deadline flexibility and funding to ensure such guidance would be feasible to implement for these shipyards. We appreciate that it would ordinarily not be appropriate for the Navy to require or recommend particular workforce management policies of its private contractors. However, we are dealing with a highly contagious and deadly pandemic unlike anything our country has faced in over a century, and private shipyards are working to simultaneously maintain contractual obligations while complying with critical state and local public health orders. Therefore, we believe the Navy should take aggressive actions to ensure the health of the shipyard industrial base workforce is not put at undue risk as governments at all levels work to halt the spread of COVID-19.
>
> Again, thank you for your attention to this important issue, and we look forward to your prompt response.[118]

April 10, 2020, Letter

On April 10, 2020, Members of Congress representing districts associated with the four government-owned, government-operated naval shipyards (NSYs) sent a letter to the Acting

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press reports about this letter, see Aaron Mehta, "Maine Lawmakers Want Contract Relief, Quicker Payments for Industry to Combat COVID-19 Impact," *Defense News*, March 19, 2020; and Mallory Shelbourne, "Maine Lawmakers Press Esper, Modly to Help Industrial Base Face Effects of Coronavirus," *InsideDefense.com*, March 20, 2020.

[118] Letter from Senator Susan M. Collins, Senator Angus S. King, Jr., Representative Chellie Pingree, and Representative Jared Golden to Acting Secretary of the Navy Thomas B. Modly, dated March 27, 2020, accessed on April 1, 2020, at https://www.collins.senate.gov/sites/default/files/2020.03.27%20-%20follow%20up%20letter%20Maine%20delegation%20letter%20to%20Sec.%20Modly%20final.pdf. For a press report about this letter, see Scott Thistle, "Maine's Congressional Delegation Urges Navy to Ease Pressure on BIW to Keep Operating," *Portland (ME) Press Herald*, March 27, 2020.

Secretary of the Navy asking that the Navy authorize incentive pay for workers at the NSYs. The text of the letter is as follows:

> At a time when our nation faces an unprecedented public health crisis and the majority of governors have enacted stay at home orders in their states, thousands of federal civilian workers have continued to report for duty each day at the Navy's four public shipyards. These workers perform a critical service to our country and help maintain the aircraft carriers, submarines, and other warships that ensure our national security and protect the American people.
>
> We are proud to represent in Congress these steadfast and dedicated workers. The health of the workers and their families is critical to their ability to meet the needs of the mission and to continue that mission. They know that our Navy and nation's sailors count on them to ensure the readiness of the fleet to respond to national security threats.
>
> Because they have continued to report for duty during this public health emergency, we ask the Navy to authorize incentive pay for these essential workers. Such incentive pay would conform to guidance already promulgated by the Office of Personnel Management to federal agencies and departments that allows for retention incentives of up to a certain percentage of basic pay to a group or category of employees. We ask that the authorization cover the duration of this crisis. We further ask that every effort be made to provide Personal Protective Equipment as soon as possible to those workers at greatest exposure.
>
> There is no doubt that our federal workers are some of this country's greatest assets. The Navy cannot fulfil its mission without these workers. With that in mind, we believe that authorizing incentive pay is one much needed step to show them that the federal government and Navy have their backs when they most deserve and need that support.[119]

[119] Letter from Representatives Derek Kilmer, Elaine Luria, Chellie Pingree, Robert C. "Bobby' Scott, Chris Pappas, and Ed Case, to Acting Secretary of the Navy James E. McPherson, dated April 10, 2020, accessed on April 22, 2020, at https://kilmer.house.gov/imo/media/doc/Kilmer%20Shipyard%20Worker%20Letter.pdf.

Appendix K. DOD and Navy Memoranda and Press Reports Regarding COVID-19 (Coronavirus) Impact on Shipbuilding Programs

This appendix presents excerpts from DOD and Navy memoranda and from press reports regarding the potential impact of the COVID-19 (coronavirus) situation on the execution of Navy (and Coast Guard) shipbuilding programs.

DOD and Navy Memoranda

This section provides information on some DOD and Navy memoranda relating to contracting and execution of acquisition programs during the COVID-19 (coronavirus) situation that have been reported in the press. It is not a comprehensive listing of such memoranda. DOD states that as of April 30, 2020, it had issued 22 guidance actions aimed at helping relieve COVID-19 (coronavirus) impacts for the contracting community.[120]

March 20 DOD Memo on Defense Contractors as Critical Infrastructure

A March 20, 2020, press report stated:

> The U.S. Defense Department has declared that defense contractors are "critical infrastructure" to national security, a designation that comes with an expectation to maintain a consistent, normal work schedule amid the outbreak of the new coronavirus, COVID-19.
>
> In a Friday [March 20] memo to industry, Undersecretary of Defense for Acquisition and Sustainment Ellen Lord made it clear that she wants defense companies to continue to deliver their products and services to the Pentagon on time.
>
> "If you work in a critical infrastructure industry, as designated by the Department of Homeland Security, you have a special responsibility to maintain your normal work schedule," Lord wrote. "We need your support and dedication in these trying times to ensure the security of this Nation. I understand that this national emergency presents a challenge and we are dedicated to working closely with you to ensure the safety of the workforce and accomplishments of the national security mission."
>
> Lord also spelled out large swaths of the industrial base for which this order applies, including the aerospace sector; mechanical and software engineers; manufacturing/ production workers; IT support; security staff; security personnel; intelligence support; aircraft and weapon systems mechanics and maintainers; suppliers of medical suppliers and pharmaceuticals; and critical transportation.
>
> Included in the designation are personnel working for companies as well as subcontractors who perform under contract for the department. Contractors who perform tasks such as providing office supplies, recreational support or lawn care are not considered essential.
>
> By designating the defense industry in such a way, companies involved may be able to get around state-directed shutdowns such as the one in New York right now. Similarly designated workers include, among many others, law enforcement, health care providers,

[120] Source: Ellen M. Lord, Deputy Secretary of Defense for Acquisition and Sustainment, as quoted in Richard R. Burgess, "DoD's Lord: Potential for 3-Month Slowdown in Defense Acquisition," *Seapower*, April 30, 2020.

> water and power authorities, and IT support for emergency services—all of whom are still on duty in the current crisis.
>
> In the memo, Lord noted, companies involved should "follow guidelines from the Centers for Disease Control and Prevention as well as State and local government officials regarding strategies to limit disease spread." Some companies have instituted work-from-home policies where applicable, although in cases such as production of defense equipment or work in secure facilities, that option appears unrealistic.[121]

March 20 DOD Memo on Progress Payments

On March 20, 2020, the Office of the Under Secretary of Defense for Acquisition and Sustainment issued a memorandum to acquisition executives and other officials throughout DOD stating, "Effective immediately, in response to the Coronavirus Disease 2019 (COVID-19) national emergency, the progress payment rates at Defense Federal Acquisition Regulation Supplement (DFARS) 232.501-1 are increased to 90 percent for large business concerns and 95 percent for small business concerns." The memorandum provides detailed instructions on the clauses in acquisition regulations that are to be used in implementing the direction.[122]

March 20 Navy Memo Withholds and Retentions

On March 20, 2020, James Geurts, the Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RDA)—the Navy's acquisition executive—issued a memorandum to the commanders of Navy system commands and Navy Program Executive Officers (PEOs) providing direction to reduce withholds and retentions, meaning the withholding and retention of government payments to contractors. Withholds and retentions are normally used by the government to encourage contractors who are not performing well to meet their contractual obligations. The text of the memorandum is as follows:

> Given the National Security Declaration by the President, it is imperative we keep the Nation's, and the Navy's, defense industrial base from going into extremis during the current COVID-19 crisis. A key element of this is to ensure companies, and in particular the underlying suppliers, remain solvent and available to support the Navy.
>
> The ship, air, weapon, ground, network/IT and associated repair industry, as part of the Defense Industrial Base, are elements of the Nation's Critical Infrastructure as defined by DHS [Department of Homeland Security]. We need them operating now and as we come out of this crisis.
>
> My intent is that we remove barriers to maximize efficient execution of our existing contracts and award of our pending/future contracts. This includes immediate engagement on all activities to positively impact cash flow. As such, I request your teams to:

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[121] Aaron Mehta, "Pentagon Declares Defense Contractors 'Critical Infrastructure,' Must Continue Work," *Defense News*, March 20, 2020. See also Tony Bertuca, "Defense Industrial Base Deemed 'Critical' Amid COVID-19 Shutdowns," *InsideDefense.com*, March 20, 2020. See also Paul McCleary, "COVID-19: Lord Urges Defense Workers To Stay On The Job; Cites White House," *Breaking Defense*, March 20, 2020.

[122] Memorandum from Office of the Under Secretary of Defense, Acquisition and Sustainment, Subject: Class Deviation—Progress Payment Rates, undated but reportedly issued March 20, 2020. A copy of the memorandum was posted on March 20, 2020, at InsideDefense.com. See also Marjorie Censer, "New Pentagon Memo Increases Progress Payment Rates in Response to COVID-19 Outbreak," *InsideDefense.com*, March 20, 2020. See also Anthony Capaccio, "Pentagon Raises Contractor Payments to Keep Cash Flowing," *Bloomberg*, March 22, 2020; Cal Biesecker, "DoD Boosts Progress Payment Rates To Industry; Boeing To Pause Puget Sound Operations," *Defense Daily*, March 23, 2020.

- Immediately reduce retentions/withholds on existing efforts to an absolute minimum.
- Pay all our settled REAs [Requests for Equitable Adjustment][123] immediately, submit requests for obligation of expired funds where required in support of this immediately and resolve all remaining REAs as quickly as possible, including preparing provisional payments where appropriate with reservation of right of recoup any overpayment upon final settlement. I encourage you to set up dedicated teams to do this as max [maximum] pace.
- Ensure retentions/withholds are at minimum allowable level for any new work placed under contract in 2020.
- Ensure all government personnel required to process inspection, acceptance, invoicing and payments and resolve these type business issues are declared mission essential.
- Adjust inspection criteria where needed to enable work execution at a faster rate and/or ensure work performed can be completed provided adequacy of work is ensured.
- Where possible, accelerate negotiations and award for future work including the use of UCAs [Undefinitized Contract Actions][124] as necessary, including contract changes in the pipeline or existing contracts.
- Where UCAs are necessary, maximize obligations and allowable expenditures against those UCAs. Consult with DASN (P) [Deputy Assistant Secretary of the Navy (Procurement)] on additional authorities up to and including obligations up to 100% [of available funding].

We are operating in a National Emergency and so we need to move out accordingly. This is not [a] business as usual situation. As the Navy's acquisition and sustainment leaders, I expect you to be bold in implementing these measures.[125]

March 24 Navy Memo Regarding Research and Development Industrial Base

On March 24, 2020, the Navy acquisition executive issued a memorandum directing the Chief of Naval Research (CNR), Navy system commands, and Navy Program Executive Officers (PEOs) to take various actions (including some similar to those listed above in the Navy's March 20 memorandum) regarding the Navy's research and development industrial base, so as to positively affect cash flow at research and development organizations, ensure that the current workload at these organizations is completed, and bring new partners into the Navy's research and development industrial base.[126]

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[123] REAs are requests that contractors submit to the government for an adjustment to the contract price under a contract clause providing for such an adjustment. For brief online discussions of REAs, see "Requests for Equitable Adjustments ('REAs') and Claims," Seidman & Associates, P.C., undated, accessed March 21, 2020, at https://www.seidmanlaw.com/requests-for-equitable-adjustments-and-claims; and "Definition of Equitable Adjustment FAR [Federal Acquisition Regulation] 52.243 in Government Contracts," Watson & Associates, LLC, accessed March 21, 2020, at https://blog.theodorewatson.com/definition-of-equitable-adjustments-in-government-contracts.

[124] UCAs are contract actions for which the contract terms, specifications, or price are not agreed upon before performance commences. For a brief online discussion of UCAs, see "Undefinitized Contract Actions (UCA)," AcqNotes, updated June 4, 2018, accessed March 21, 2020, at http://acqnotes.com/acqnote/careerfields/undefinitized-contract-actions-uca.

[125] Memorandum from Assistant Secretary of the Navy, Research, Development, and Acquisition (ASN RD&D) [sic: ASN RD&A] to Navy Syscom Commanders and Program Executive Officers, Subject: (Intent and Direction) Withholds and Retentions During COVID-19, March 20, 2020. In the memorandum, some of the bullet points lacked periods at the end; in reprinting the text of the memorandum here, CRS has placed periods at the end of those bullet points.

[126] Memorandum from Assistant Secretary of the Navy, Research, Development, and Acquisition to Chief of Naval

March 31 DOD Memo on Managing Defense-Contract Impacts of COVID-19

On March 30, 2020, the Office of the Under Secretary of Defense for Acquisition and Sustainment issued a memorandum on managing the impacts of the COVID-19 (coronavirus) situation on defense contracts. The memorandum stated that "the effects of COVID-19 will affect the cost, schedule, and performance of many DoD contracts." The memorandum stated further:

> DoD contracts contain clauses that excuse performance delays, including Federal Acquisition Regulation (FAR) 52.249-14, Excusable Delays; various "Termination" clauses; and FAR 52.212-4 for commercial contracts. Each of these clauses provides that a contractor will not be in default because of a failure to perform the contract if the failure arises beyond the control and without the fault or negligence of the contractor. In the event of such a delay, the contractor is entitled to an equitable adjustment of the contract schedule. Where the contracting officer directs changes in the terms of contract performance, which may include recognition of COVID-19 impacts on performance under that contract, the contractor may also be entitled to an equitable adjustment to contract price using the standard FAR changes clauses (e.g., FAR 52.243-1 or FAR 52.243-2).
>
> Requests for equitable adjustment must be considered on a case-by-case basis, in consideration of the particular circumstances of each contract, impacts realized from COVID-19, applicable law, and regulations, and inclusive of any relief that may be authorized by laws enacted in response to this national emergency. When reviewing requests for equitable adjustment, contracting officers are to take into account, among other factors, whether the requested costs would be allowable, allocable and reasonable to protect the health and safety of contract employees as part of the performance of the contract. Equitable adjustments to the contract or reliance on an excusable delay should not negatively affect contractor performance ratings.
>
> In response to this national emergency, on March 27, 2020, the President signed into law the Coronavirus Aid, Relief, and Economic Security Act (CARES). Most notable within the act is Section 3610, Federal Contractor Authority, which provides discretion for the agency to modify the terms and conditions of the contract to reimburse paid leave where contractor employees could not access work sites or telework but actions were needed to keep such employees in a ready state (Attachment 1). Section 3610 is included for information only. DPC will provide implementing guidance for this section as soon as practicable.
>
> The Office of Management and Budget, and many senior procurement officials of the Military Departments and Agencies have promulgated guidance similar to that in this memo regarding management of contract performance impacts due to COVID-19, many of which are available at https://www.acq.osd.mil/dpap/pacc/cc/COVID-19.html. They share the common theme that contracting officers are trusted and empowered to make the difficult decisions on appropriate adjustment to each contract. Both during and after the COVID-19 emergency, contracting officers must work closely with our industry partners to ensure continuity of operations and mission effectiveness, while protecting the continuing vitality of the DIB that is so critical to our national security.[127]

Research (CNR), Navy system commands, and Navy Program Executive Officers (PEOs), Subject: (Intent and Direction) Engaging the Research and Development Industrial Base during COVID-19, March 24, 2020. The article was posted at InsideDefense.com on March 26, 2020. For an article discussing this memorandum, see Justin Katz, "Geurts Urges Navy R&D to Push OTAs, Rapid Prototyping During COVID-19 Pandemic," *Inside Defense*, March 26, 2020.

[127] Memorandum from Office of the Under Secretary of Defense, Acquisition and Sustainment, Subject: Managing Defense Contracts Impacts of the Novel Coronavirus, undated but signed on March 30, 2020, by Kim Herrington, Acting Principal Director, Defense Pricing and Contracting.

April 9 DOD Memo on Implementing Section 3610 of CARES Act

On April 9, 2020, the Office of the Under Secretary of Defense for Acquisition and Sustainment issued a memorandum providing guidance for implementing Section 3610 of the Coronavirus Aid, Relief, and Economic Security (CARES) Act (H.R. 748/P.L. 116-136 of March 27, 2020).[128] A DOD statement summarizing the memo stated:

> The Defense Pricing and Contracting (DPC) office has issued a class deviation to the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS) entitled, "CARES Act Section 3610 Implementation." This deviation addresses section 3610 of the Coronavirus Aid, Relief, and Economic Security (CARES) Act which allows agencies to reimburse contractors for payment to workers who are prevented from working due to COVID-19 facility closures or other restrictions.
>
> The deviation provides a framework for contracting officers to assess any claimed allowable costs associated with the declared public health emergency, recognizing the importance of supporting affected contractors to ensure that, together, we remain a healthy, resilient, and responsive total force. In short order, a forthcoming implementation guidance memo and Frequently Asked Questions (FAQs) document will provide additional information and will be available on the Defense Pricing and Contracting website.
>
> This class deviation is the 17th new COVID-19 guidance the Department of Defense's Pricing and Contracting (DPC) office has provided to help relieve COVID-19 impacts for the Contracting Community.
>
> Deputy Assistant Secretary of Defense (DASD) for Industrial Policy Jennifer Santos, and Acting Principal Director, Defense Pricing and Contracting, Mr. Kim Herrington, have worked extensively with the defense industrial associations, including the small business community, to identify cost, schedule and performance impacts beyond the control of the contractor, and to provide badly needed relief to help defense industry get through this national emergency.[129]

Press Reports

The excerpts from recent press reports below are presented in chronological order, with the most recent on top.

A May 5, 2020, press report stated:

> A top U.S. Navy official said acquisition and sustainment could emerge stronger, having withstood disruptions during the COVID-19 crisis.
>
> Speaking May 4 as part of a Navy League webinar sponsored by IBM for small businesses in the defense industry, James F. Geurts, assistant secretary of the Navy for research, development and acquisition, said he views the pandemic as a crucible, where there will be some delays in production and maintenance, but also as an opportunity to strengthen the system.

[128] Memorandum from Office of the Under Secretary of Defense, Acquisition and Sustainment, Subject: Implementation Guidance for Section 3610 of the Coronavirus Aid, Relief, and Economic Security Act, undated but signed on April 9, 2020, by Kim Herrington, Acting Principal Director, Defense Pricing and Contracting. See also Aaron Mehta, "Newest DoD Industry Guidance Clarifies Repayments, Makes Prototyping Easier," *Defense News*, April 9, 2020. See also Vivienne Machi, "DoD to Continue Payments to Contractors Off Work Due to COVID-19," *Defense Daily*, April 10, 2020.

[129] DOD news release, "DOD Allows Payments to Contractors Who Cannot Work Due to COVID-19 Facility Closures or Other Restrictions," April 9, 2020.

> "What new opportunities does that enable for us to leverage?" Geurts asked. "If you would have asked me four months ago, 'Could the team go 95%-plus telework, increase contract awards 33%, do so with 10% less contracts, and at the same time get their distance learning up by 65%, I would have laughed a little bit. And we've [achieved those metrics] in the last seven weeks."
>
> "I don't see it as much as a disruption to our future plans … as an accelerant to our future plans," Geurts added. "The goal for us is, how do we come out of this stronger than we were, and how do we work now to increase the speed by which we come out of this."
>
> Geurts cited the late April award of the FFG(X) frigate contract to Marinette Marine three months ahead of schedule, which brought the total of Navy contract awards $25 billion ahead of the same point last fiscal year. By his recollection, this fiscal year is the first where all financial benchmarks have been exceeded.
>
> "So, I don't view it as much as a delay as an accelerant," he said. "We will continue to adapt as the warfighter requires. I don't see us having to adapt our programs in a major way. We're going to have to figure out how to capture in a bottle all the great things that have occurred in the last seven or eight weeks where we've gained this operational effectiveness and be thoughtful of where we're going to have to manage risk downstream. But in terms of drastic changes to programs or schedules, I don't see that."[130]

Another May 5, 2020, press report stated:

> Electric Boat president Kevin Graney, who himself tested positive for COVID-19 last month but has since recovered, announced Tuesday that there are now 40 positive cases at EB.
>
> Graney also announced that in addition to EB-branded face coverings that will be provided to employees and must be worn while at work, the shipbuilder will be begin its own testing later this week.[131]

A May 1, 2020, press report stated:

> The Navy's top acquisition official said it will take several more weeks to see the full extent of the COVID-19 pandemic disruption on shipyard work. When asked by reporters about Undersecretary of Defense for Acquisition and Sustainment Ellen Lord's comments on DoD expecting three months of slowdowns on major defense acquisition programs (MDAPs), James Geurts said he believes she meant there will be a range of zero to three months in delays. "I would say in the Navy we're doing a pretty good job right now of balancing the risk and the mitigations. I do think there will be some delay and disruption but…I certainly wouldn't characterize all MDAPs will have a three-month impact." He added the next several weeks will be important. "It will give us more data on both the extent that the delay and disruption continues and the impact of our mitigations that we've been active in putting in place over the last four or five, six weeks."…
>
> Geurts said they are also closely watching impacts on global supply chains for defense production to understand any impacts and how to manage through them while consulting with governments like Spain and Italy. "We're watching Rota, Spain—obviously we do some ship repair work there [on four U.S. Navy destroyers that are homeported there]. And so we're managing around that, I would not put that in the crisis mode yet," Geurts said. He noted Italy is a source of supply parts for the [Marine Corps] amphibious combat vehicle [ACV] and has had factory shutdowns there in the past months. "Everyone's working very aggressively to manage around it. There's nothing I would put in a crisis

[130] Richard R. Burgess, "Geurts: COVID-19 Crisis Offers Opportunity to Strengthen Acquisition, Sustainment," *Seapower*, May 5, 2020.

[131] Ellyn Santiago, "Electric Boat To Begin Its Own COVID-19 Employee Testing," *Patch*, May 5, 2020.

> mode yet. We're just keeping an eye on it. We have flexibility in many of the programs to just rephase elements of construction or use stock we have on hand."[132]

An April 30, 2020, press report stated:

> The Defense Department's top acquisition official said the department is working closely with the industrial base to mitigate the effects of the COVID-19 pandemic but said there is the potential for a three-month slowdown in procurement and sustainment.
>
> "We continue to assess the impact of a potential three-month slowdown to many programs due to COVID-19," said Ellen M. Lord, deputy secretary of defense for acquisition and sustainment, speaking April 30 at the Pentagon to reporters.
>
> "I intentionally used the word slowdown and impact and not saying the word 'delay,' which carries a very different connotation," Lord added. "We have seen inefficiencies across many programs. COVID-19 is temporarily shutting down defense manufacturing facilities and production lines, disrupting supply chains and distressing the financial stability of the companies DoD relies on to protect the nation. DoD continues to partner with industry to do everything possible to keep programs on schedule and to minimize the cost and schedule impacts."
>
> Lord praised the work of the Defense Contracting Management Agency (DCMA) and Defense Logistics Agency (DLA) in tracking the status of companies up and down the defense supply chain.
>
> "Out of the 10,509 companies DCMA tracks, 93 are closed, down 13 from last week, with 141 companies having closed and reopened, up very significantly 73 from last week's number of 68," she said. "This is the first time we have seen reopening numbers larger than the number of closures.
>
> "Out of the 11,413 companies DLA tracks, 437 are closed with 237 having closed and re-opened, almost 100 companies from last week."
>
> Lord noted that "while we have seen minor improvements, we continue to see the greatest impacts in the aviation supply chain, shipbuilding and small space launch [companies]."
>
> Lord said her office's policy team led by Jen Santos is "leading multiple industry calls making calls every week with 18 industrial associations."
>
> "Tim Harrington, director of Defense Pricing and Contracting, has issued 22 defense pricing and cost memos, aggressively responding to industry needs and impacts. The memos include guidance for increased telecommuting, increased progress payment rates, acquisition timeline impacts, reimbursement for those prevented from working, and more," she said.[133]

Another April 30, 2020, press report stated:

> Newport News Shipbuilding is moving from three shifts to two shifts beginning Monday [May 4], with a three-hour period in between to allow cleaning of high-touch surfaces, President Jennifer Boykin announced Thursday during a virtual news conference. As another response to the COVID-19 pandemic, the company will also begin taking the temperatures of everyone entering the shipyard beginning Friday [May 1].
>
> Currently, most workers are on the first shift, and significantly fewer are on second and third shifts, Boykin said, so the change Monday will mean more people will work the

[132] Defense Daily News staff, "Defense Watch: COVID Delays, DDG-1002, SASC Hearings, OPC," *Defense Daily*, May 1, 2020.

[133] Richard R. Burgess, "DoD's Lord: Potential for 3-Month Slowdown in Defense Acquisition," *Seapower*, April l3, 2020. See also Pat Host, "Covid-19: More US Defence Contractors Re-open than Close for First Time Since Virus Struck," *Jane's*, May 2, 2020.

> second shift, reducing the number of workers on first shift and allowing for better social distancing.
>
> Thirty-five employees out of the company's 25,000-person workforce have tested positive for COVID-19 since March 23, and everyone entering the shipyard is required to wear a mask.
>
> Screeners will be posted at each of the shipyard's seven open gates, taking temperatures with infrared, non-contact temperature readers, Boykin added. If anyone has a temperature 100 degrees or higher, they will undergo a secondary temperature screening. Anyone who tests twice for a temperature of 100 degrees or higher will be sent home.[134]

An April 29, 2020, press report stated:

> Bath Iron Works is calling workers to resume normal attendance starting Monday, May 11, after a large number of workers took extended time off due to coronavirus.
>
> Leaders of International Association of Machinists and Aerospace Workers Local S6, BIW's largest union, said they have more questions than answers because the union was not told of BIW's decision before it was sent to employees.
>
> "We believe we should've had a seat at the table when discussing the safety of the employees," said Chris Wiers, president of Local S6. "We have not been afforded that, so now we're in the same position that everyone else is in. We're just asking questions because there are a tremendous amount of unknowns."…
>
> In a Wednesday [April 29] notice to employees, BIW listed four options its employees can choose from: Return to work, request an alternative shift assignment, use unused paid time off or request a leave of absence for a minimum of 30 calendar days, up to 90 calendar days. The employees will have to take one of those options by Monday, May 11.
>
> The notice states a leave of absence will be granted to employees who have, or live with a family member who has, a medical condition that puts them in the coronavirus "high-risk" category as defined by the Centers for Disease Control.
>
> Employees also can apply for leave if they're caring for a child or if there are "circumstances beyond the employee's control which will prevent their ability to report to work due to the COVID-19 pandemic."…
>
> The company said its demand for employees to return to work is attached to Gov. Janet Mills' four-stage plan to reopen Maine's businesses and public spaces.…
>
> The shipyard's decision to remain open was repeatedly rebuked by Maine lawmakers and union leaders alike.…
>
> Despite remaining open, BIW offered employees extended unpaid leave, and about 60 percent of workers did not clock in after two employees tested positive for the virus in late March and early April. The shipyard confirmed both workers have since recovered and returned to work as of April 23. No other employees have tested positive.
>
> David Hench, BIW spokesman, said the shipyard is still seeing 25% to 30% under normal attendance as of Thursday, April 30.
>
> Wiers said only 45% of Local S6 union members have come into work over the last four weeks.
>
> Despite no new positive cases of coronavirus from within the shipyard, BIW continues to encourage workers to wear face coverings while working, but it isn't mandatory. The

[134] Kate Andrews, "Newport News Shipbuilding Moving from Three to Two Shifts," *Virginia Business,* April 30, 2020.

> shipyard has distributed 7,500 face coverings to employees according to an April 26 news release.
>
> On April 24 the company announced it mailed disposable thermometers to employees for checking their temperature each day before coming into work. On the company website, BIW said this is "a voluntary effort, but it is an important part of the most current guidelines available and participation is strongly encouraged to keep employees safe."[135]

Another April 29, 2020, press report stated:

> General Dynamics Electric Boat remains ready to start construction of the first Columbia-class ballistic missile submarine in October, company officials announced Wednesday [April 29].
>
> To date, Electric Boat's preparations to start building the first of 12 planned Columbia-class boomers, along with work at the yard building the Virginia-class fast attack submarines, has not experienced significant delays due to COVID-19, Phebe Novakovic, the chief executive of General Dynamics, told analysts during a Wednesday conference discussing the company's first-quarter financial results.
>
> "The performance was good and particularly solid at Electric Boat," Novakovic said. "We've also increased our advanced construction on the first Columbia as we approach the planned construction date in October of this year."…
>
> Now, as companies take measures to protect their workforces from catching and spreading COVID-19, Novakovic said the company is working to limit supply chain disruptions and work slowdowns. General Dynamics has pushed roughly $300 million to prop up its suppliers while they deal with business disruptions caused by COVID-19.
>
> "Since the onset of the COVID-19 crisis, we have supported our government customers and implemented multiple safety measures to keep our people as safe as possible," Novakovic said in a statement released before markets opened Wednesday. "We are responding to the COVID travel restrictions' impact on Gulfstream and are managing our costs throughout our business."[136]

An April 28, 2020, press report stated:

> The U.S. Navy has paid defense contractors $600 million it had withheld to ensure contract performance, hoping the funds would shore up finances for suppliers ravaged by the coronavirus-driven economic downturn, a Navy official said on Tuesday [April 28].
>
> The move, which follows a similar action taken by the Air Force that released billions of dollars in payments, is aimed at replacing revenue vital Pentagon suppliers have lost in their non-military businesses as the spreading coronavirus has halted business activity nationwide.
>
> "We were immediately able to infuse about $600 million of funds that we had on withholds," James Geurts, the assistant secretary of the Navy for research, development and acquisition, told reporters on a conference call.
>
> A Navy spokesperson said "for example, with the ship repair industry, withholds were reduced to one percent." The Navy was unable to say whether a portion of the $600 million was withheld due to poor contractor performance.…

[135] Kathleen O'Brien, "BIW Calls Employees Back to Work as State Begins to Rreopen," *Portland (ME) Press Herald*, April 29 (updated April 30), 2020. See also Christopher Burns, "Bath Iron Works Calls Workers Back to the Shipyard," *Bangor (ME) Daily News*, May 1, 2020.

[136] Ben Werner, "Pandemic Isn't Slowing Down Columbia-Class Submarine Construction," *USNI News*, April 29, 2020.

> Government waste watch-dogs criticized the move.
>
> "This current emergency shouldn't be an excuse to avoid accountability for poor performance that predated this outbreak," said Mandy Smithberger, of the Project On Government Oversight in Washington.
>
> Earlier this month, Geurts said he had authorized "hundreds of millions" of dollars to be paid out to top suppliers like General Dynamics (GD.N) and Huntington Ingalls Industries (HII.N) which could flow to the supply chain.
>
> Representatives from Huntington Ingalls and General Dynamics said the Navy was not withholding money from them for poor performance.
>
> While the Navy did not name any companies that received payments, industry sources have said the biggest contractors have been filtering coronavirus-related funds to their suppliers and subcontractors who, because of their smaller size, are on much shakier financial footing.[137]

Another April 28, 2020, press report stated:

> Navy leaders and defense industry execs are worried about the effect the COVID-19 pandemic is having on their supply chains, potentially interrupting critical repair and refit availabilities that could have knock-on effects on deployment schedules.
>
> The Navy's acquisition chief James Geurts told reporters recently that so far, industry is "holding pretty good on near-term milestones," but he's worried about long-term effects on ship repair and the industry's ability to keep pace.
>
> However, the pandemic seems to be having some beneficial effects.
>
> "Part of my goal for our team is not to recover necessarily to where we were," before COVID-19, but to change some fundamentals of how the Navy's business gets done, he said. With most of the Navy acquisition force teleworking, "we're basically 32 percent ahead on contract awards," of where they planned to be at this point in the year. "And so, that means there are processes that are working much more efficiently now than they were before, so I want to capture those," he said.
>
> The Navy and shipbuilders are trying to do the same thing in the shipyards where "maybe different techniques will allow us to gain some efficiency while also creating some resiliency," that will help weather any future disruptions and setbacks.
>
> The big shipbuilders like Huntington Ingalls and Bath Iron Works are staggering shifts and allowing liberal leave and teleworking without suffering much disruption so far, company officials have said.
>
> Geurts said the lessons they're learning could lead to the conclusion that, "we cannot operate the way we used to operate, which had a lot of fragility and brittleness as we're seeing right now. It's got to drive to the way we need to operate in the future, which has to have resiliency for whatever disruption that might come up. That's what we're really trying to watch closely and think two or three phases ahead, and not just get caught up in managing today's crisis."…
>
> In the end, "we've got to manage our way through delay and disruption, but really focus on steepening the recovery and reinvention phase to get into the place we need to be," Geurts said. "I think there are ways we can come out of this much more resilient, but you

[137] Mike Stone, "U.S. Navy Pays Contractors $600 Million Held Back to Ensure Performance," *Reuters*, April 28, 2020. See also Justin Katz, "Geurts: Navy 'Infused' $600M to Shipbuilding Base in Response to COVID-19," *Inside Defense*, April 28, 2020.

> know it's hard to change bureaucracy and institutional ways of doing business [to] make sure that this disruption doesn't go to waste."[138]

Another April 28, 2020, press report stated:

> It's still too early to say if the COVID-19-related economic slowdown is significantly disrupting the production of major programs, the Navy's top weapons-buyer said during a media call Tuesday [April 28].
>
> At the shipyards, the near-term priority work is on track. However, the Navy is still watching how COVID-19-related restrictions and supply-chain problems are disrupting the mid- and long-term work, James Geurts, the assistant secretary of the Navy for research, development and acquisition, said Tuesday.
>
> Asked about continuing operations while the virus hits or threatens shipyards and manufacturers, Geurts said, "we are seeing less [disruption] than in the first couple weeks, but we are still learning and studying hard what the potential downstream impacts could be." He added the Navy and its industry partners were only about five weeks into the pandemic and so it would be hard to draw any larger conclusions yet about impacts to specific programs or sectors.…
>
> The best-case scenario is zero infections, Geurts said. But the reality is everyone—the Navy and its contractors—recognize COVID-19 is present and must focus on understanding how to operate within the Centers for Disease Control and Prevention guidelines while also accomplishing the mission….
>
> "We have, I can say we have about 10 times as many people working remotely today as we did six weeks ago," Mike Petters, HII's chief executive, said during the shipbuilder's virtual annual meeting Tuesday morning.
>
> Roughly 10,000 employees are now teleworking, Beci Brenton, a Huntington Ingalls Industries spokeswoman, told USNI News after the meeting.…
>
> Throughout the industry, shipyards are increasing their screening efforts, including checking employees every day using temperature readers, Geurts said. Workers with fevers are told to stay home or directed to seek medical attention. Companies are also adjusting how workers enter yards so temperatures can be taken remotely without too many people queueing up together.
>
> Ingalls Shipbuilding just started temperature checks as workers arrived. Anyone with a temperature of 100.5 or higher is directed to get a recheck. If the second check is still 100.5 or higher, the employee is sent to get a COVID-19 test and quarantine as necessary. Newport News Shipbuilding will start a similar process next week, Brenton said.
>
> "My sense right now is it is stabilizing and we are learning how to operate more and more efficiently in the midst of [the disease], as opposed to strictly trying to avoid having any infections," Geurts said.[139]

An April 27, 2020, press report stated:

> The Pentagon is bracing for a possible three-month delay across its major acquisition programs because of the COVID-19 outbreak.…
>
> [DOD acquisition chief Ellen] Lord, citing statistics from the Defense Contract Management Agency, said out of 10,509 "major prime companies," 106 are closed, with

[138] Paul McCleary, "Navy Acquisition Boosts Ship Contract Awards Under COVID-19," *Breaking Defense*, April 28, 2020. See also Lee Hudson, "COVID-19 Alters DOD View Of Supply Chain," *Aviation Week*, April 28, 2020.

[139] Ben Werner and Megan Eckstein, "Shipyards Continue to Balance COVID-19 Mitigation With Efficient Operations," *USNI News*, April 28, 2020.

> 68 companies having closed and reopened. Out of 11,413 "vendor-based companies," she said 427 are closed, with 147 having closed and reopened.
>
> "Domestically, we are seeing the greatest impacts in the aviation supply chain, shipbuilding and small space launch," she said. "So right now there isn't any specific COVID penalty that we see for a specific program; however, we do anticipate about a three-month slowdown."
>
> Defense contractors will not be penalized for delays related to COVID-19, however, and can ask the government to be reimbursed for any costs incurred. Lord said she expects that bail-out effort to cost "billions and billions."[140]

An April 20, 2020, press report stated:

> The shipbuilding, aviation and small space launch sectors are the three hardest-hit by the COVID-19 pandemic within the defense industrial base, according to the under secretary of defense for acquisition and sustainment, despite a slew of memos and authorities signed out by the Pentagon to relieve pressure from sick workers and facilities closures.
>
> "We see a slowdown in the shipyards to an extent. Aviation is actually the most highly impacted sector we have right now. So the 20 different memos that Kim Herrington (director of defense pricing and contracting) put out are really to make sure our cash flows and we quickly get on contract so we can keep going," Ellen Lord told reporters on a Monday [April 20] morning news conference.
>
> She said her team is still in the process of going program by program and understanding what production milestones may be at risk due to pandemic-related disruptions – everything from work slowing down on assembly lines to allow for social distancing, to coping with a smaller workforce as some employees are sick or taking leave to care for children at home, to breaks in the supply chain as component suppliers struggle to keep on schedule. For now, Lord said she could not point to any specific programs or any specific milestones most at risk, but she said major defense acquisition programs as a whole will face about a three-month slowdown due to COVID-19.
>
> To try to stay ahead of the spreading disease, "we follow very carefully where the highest number of cases are throughout the country and we look at the defense industrial base, where they are located, so we try to anticipate the problems and work with the companies to keep going to the greatest degree possible" and work with companies in emerging hot spots to put mitigation measures in place before their workforces are hit….
>
> Without naming companies or sectors, Lord said in her opening remarks that, of 10,509 major prime contractors, 106 are currently closed and 68 have closed and already reopened. On the vendor side, out of 11,413 companies, 427 are closed, with another 147 having closed and reopened.
>
> Though the Pentagon can't help companies having to close because the workforce is sick, leaders can ensure that companies with healthy workers aren't left without work and waiting for contracts to be signed. The Navy and DoD have accelerated contract awards and urged prime contractors to quickly push work down to their suppliers of all sizes, so that as soon as a company is ready for new work, the work is awarded and money already paid.[141]

An April 16, 2020, press report stated:

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[140] Tony Bertuca, "DOD Monitors Industrial Base as Congress Eyes Another Massive COVID-19 Aid Package," *Inside Defense*, April 27, 2020.

[141] Megan Eckstein, "DoD: Shipbuilding, Aviation Hardest-Hit Sectors in Defense Industrial Base by COVID Pandemic," *USNI News*, April 20, 2020.

The Navy's acquisition community is trying to "leverage the condition we're in, not be a victim of it," with the service's top buyer saying he's confident his workforce can take unexpected lessons learned adjusting to the COVID-19 pandemic and actually be more efficient in the long term.

Assistant Secretary of the Navy for Research, Development and Acquisition James Geurts said the Navy this fiscal year has already awarded $88.52 billion in acquisition contracts, compared to $66.3 billion at the same time last year—a 32-percent acceleration in awarding work, and with 5 percent fewer contracting actions. He said this is also happening while more than 95 percent of his staff is teleworking. On the research side of the portfolio, the Office of Naval Research (ONR) has obligated $1.5 billion in work compared to the planned $1.029 billion at this point in the year.

The reason for rushing to get so much work on contract is to get as big a backlog as possible in place for not just prime contractors but for suppliers of all sizes around the country—so that as the coronavirus hits different geographies at different times, any companies affected by the disease will have plenty of work to come back to when the workforce is able to continue working. Geurts first told reporters about this effort last month, saying the last thing he wanted was a company with healthy workers and no work on contract to perform.

Though the reason for speeding up contract awards is for the defense industrial base, Geurts told reporters today that "we've got to manage our way through delay and disruption, but really focus on steepening the recovery and reinvention phase to get us to the place we need to be.… I think there are ways we can come out of this in a much more resilient, much higher efficiency manner than where we were. We were doing some great things previously, but it's hard to change bureaucracy and institutional ways of doing business. The team has really adapted quickly, we need to capture that and make sure this disruption doesn't go to waste."

Getting "back to normal" isn't his goal anymore, he said; rather, he believes the workforce can "get us to a future end state where we are in a better position than we were pre-crisis."

For example, Geurts said, the Navy may have lost out on accessing a lot of talented workers in the past because those people were not willing to move for a new job to work out of the Pentagon, Washington Navy Yard, or other locations. The Navy did not trust the available teleworking options, and so those potential employees went unhired. Now, with teleworking proving to be as efficient or even more so, Geurts suggested that the service could tap into even larger talent pools going forward if it were willing to continue telework practices even once the pandemic passes.

Additionally, he said, the Navy is being forced to rely on remote training, remote technology assistance and remove installation assistance options right now, where typically the service would choose to fly a team of experts from a center of excellence to the location of need in the fleet. Travel restrictions "caused us to reinvent to a large degree how we do some of that and recreate resiliency and self-sufficiency at the ship level and at the individual base level and at, quite frankly, the individual level, the person level."

The Navy has already begun researching and testing tele-maintenance options and other related efforts, but the pandemic and the related work and travel restrictions may be a forcing function to embrace those technologies faster and more wide-spread than a big institution may have been inclined to do.

Though the next crisis might look different than today's novel virus, Geurts said there will always be a next crisis ahead.

"Our sight picture cannot be the way we used to operate, which had a lot of fragility and brittleness to it, as we're seeing right now. It's got to drive to the way we need to operate in the future, which has to have resiliency for whatever disruption might come up," he said.…

> Where money has already been appropriated for programs in the current Fiscal Year 2020 budget, Geurts said the program offices are just awarding contracts early where possible. In other cases where money isn't programmed but opportunities exist to get ahead and keep industry stable, the Navy is either seeking creative business models or procurement methods or will be in talks with the administration as future stimulus packages are put together, pitching these ideas as ways to keep workers working while also increasing military readiness.
>
> On the research side of the portfolio, Geurts acknowledged that some work—particularly that done in academia, where universities are closed and student and faculty researchers dispersed—will fall behind schedule. The Navy has about 2,000 performers of basic and early research, and ONR is reaching out to each individually and "understanding their ability to get the work done, any modifications they have to make, anything we need to do on our end to try to accommodate that. We're about 50 percent through that, we hope to finish that here in the next week or so. And so what I would say is, the performance on the grants and contracts are proceeding reasonably well; generally, those who don't have access to labs or facilities are working on analyzing data, writing reports, doing test planning and whatnot. There are some that do have to modify their work plan, and for those we're working with them to give them no-cost extensions so that they're not penalized due to this disruption."
>
> "On the flip side, we're also understanding where there's opportunity to accelerate work. And maybe if there's a performer doing [Small Business Innovation Research] work and they're ready to move and we can double down on that work, we'll look to accelerate things. So I think we're looking for opportunities wherever they are – not necessarily just managing downside risk, we're also taking advantage of upside opportunity."[142]

An April 15, 2020, press report stated:

> A new shift schedule was released Wednesday [April 15] for Huntington Ingalls Industries shipbuilders in Newport News in light of recent coronavirus updates.
>
> According to a release, the shipbuilding division will shift to the new schedule starting Monday, May 4. The new normal for workers will be either a 6 a.m. to 2:30 p.m. shift, or a 6 p.m. to 2:30 a.m. shift.
>
> The changes aim to encourage social distancing among workers and give more time for cleaning busy areas.
>
> Newport News Shipbuilding is currently reporting 23 total confirmed cases of COVID-19 involving shipyard workers as of April 15.
>
> The changes will impact production workers and employees directly supporting production and providing waterfront support services.
>
> Examples of those employees include those who work in waterfront engineering, production control, the clinic, and construction project and inspection departments.[143]

An April 10, 2020, press report stated:

[142] Megan Eckstein, "Geurts: Navy Acquisition 'Managing Downside Risk,' Seeking 'Upside Opportunity,'" *USNI News*, April 16, 2020. See also Richard R. Burgess, "Geurts: Accelerated Acquisitions Position Navy, Industry for Period After COVID-19 Crisis Wanes," *Seapower*, April 15, 2020; Mallory Shelbourne, "NAVSEA Stands Up 'Rapid Action Team' to Apply New Technology During COVID-19 Crisis," *Inside Defense*, April 16, 2020.

[143] WAVY, "Newport News Shipbuilding Announces New Shift Schedule to Increase Social Distancing Efforts," *WAVY.com*, April 15, 2020.

> As the coronavirus count continues to rise, management [at Newport News Shipbuilding] has launched an all-hands effort that calls for the safe distancing of 6 feet and the use of masks when closer than six feet.
>
> A machinist at the shipyard, who does not want to be identified, says 6-foot distancing is unrealistic when you consider actual distances when building machines of war.
>
> He told WAVY News 10 he often works 2 to 3 feet away from coworkers on job sites.
>
> He says the region needs to prepare for an illness that will affect shipyard workers, contractors, members of the military and families.
>
> "The sickness could spread to their families and their children, their loved ones and whoever else that they are taking care of, so this is going to be catastrophic pretty soon," said the machinist.
>
> As of Thursday [April 9] afternoon, there were 20 reported cases of COVID-19 at the shipyard.
>
> Steelworkers Union President Charles Spivey hears similar concerns from all corners of the yard.
>
> He believes construction deadlines should be set aside and the gates of the state's largest industrial employer should be closed before it's too late.
>
> "They have shut down schools, they have shut down barbershops — churches, one that I'm a pastor of — and yet they expect the people here at Newport News Shipbuilding, management and salary, to deliver a vessel," said Spivey.
>
> The machinist is also concerned the virus will take a heavy toll on African Americans in the yard and their families.
>
> "This is actually going to be catastrophic because you have a large percentage there that are older so if they have underlying health conditions and they're African American they are going to die or get sick," according to the contract employee.[144]

Another April 10, 2020, press report stated:

> As COVID-19 has come to dominate our waking moments in 2020, traveling across the oceans and now creeping through our communities, Norfolk Naval Shipyard (NNSY) [a government-operated shipyard that overhauls, maintains, and repairs nuclear-powered Navy ships] has been finding ways to continue achieving its critical mission while simultaneously working to ensure employee safety and health….
>
> … NNSY is continuing to conduct all service to the Fleet at its main location in Portsmouth [VA]. Currently on the Portsmouth waterfront, NNSY has three vital projects that will greatly assist the Navy in three different but highly important ways. That includes USS George H.W. Bush's (CVN 77) most extensive work since commissioning, in the form of a Drydocking Planned Incremental Availability; USS Wyoming (SSBN 742), which is a critical piece in the country's nuclear deterrence strategy, getting an Engineered Refueling Overhaul; and USS San Francisco (SSN 711), which is undergoing conversion to become a next-generation Moored Training Ship ensuring highly skilled and fully capable 21st century fleet operators.
>
> The shipyard also continues to conduct mission-critical work at all its satellite locations and assisting other sites as part of the nation's One Shipyard Concept. In the past couple weeks just in Hampton Roads, recent NNSY accomplishments at Naval Station Norfolk included completing work on USS Wasp (LHD 1), successfully conducting testing on USS

[144] Regina Mobley, "Machinist Says Social Distancing Among Employees at Newport News Shipbuilding Is Unrealistic," *WAVY.com*, April 10, 2020.

> New Mexico (SSN 779), and assisting work on USS Gerald Ford (CVN 78) and USS John Warner (SSN 785); and at Huntington Ingalls-Newport News Shipbuilding, restoring systems to remove cofferdams on USS Boise (SSN 764).…
>
> The inherent challenges working to minimize spread of COVID-19 while needing ship project team members to work in relative close proximity to one another is being addressed on several fronts at NNSY. These are in addition to all the Department of Defense-mandated ways to prevent and minimize COVID-19 spread. One shipyard-specific action is NNSY's Supply Department (Code 500) taking the lead in assembling and distributing cleaning kits to the projects. These contain paper towels, gloves, and sanitizers for cleaning high touch areas and objects such as common areas and conference rooms, and doorknobs and elevator buttons. The shipyard is also preparing to implement screening procedures at the gates to curb the possibility of a person with COVID-19 entering the installation. Additionally, NNSY's Naval Facilities (NAVFAC) Public Works Department-Portsmouth has confirmed with its custodial contractor that cleaning products used at NNSY are effective at killing COVID-19.
>
> To maximize social distancing, NNSY has suspended large gatherings and meetings such as Force Multiplier trainings, monthly safety flag presentations and Employee Resource Group meetings. In their place, Shipyard Cmdr. Capt. Kai Torkelson has been filming ongoing messages for these groups as coordinated by the shipyard's Public Affairs Office (Code 1160) and Shipyard Instruction Design Center (Code 1170).
>
> NNSY's Public Affairs Office has also been releasing daily updates to the workforce, posting constant updates to the command Facebook page, and establishing a repository of important COVID-19 information on NNSY WebCentral. Capt. Torkelson has also been providing continual updates and messages of encouragement to the workforce.[145]

Another April 10, 2020, press report stated:

> The priorities of minimizing the spread while maximizing the mission do not need to be in conflict with one another at Norfolk Naval Shipyard (NNSY).
>
> "So by minimize spread, you'll be adhering to the six feet social distancing rules, supplying gloves and masks, as well as thoroughly cleaning all surfaces? If not, then you are not minimizing spread, you are part of the problem by continuing to spread the virus," wrote one person on NNSY's Facebook page April 2.
>
> NNSY leadership is working to demonstrate all of those protective actions are being performed in America's Shipyard, along with many more to safeguard the health and safety of the workforce during the national emergency caused by COVID-19. Recent initiatives on the shipyard waterfront include implementing facemasks and face shields on jobs requiring multiple people, establishing several designated cleaning times throughout the day, more effectively fanning out the workforce across all three shifts, and installing handwashing stations at the piers and dry docks.
>
> "These important actions show employee safety, health and well-being are our top priority while we continue to meet the mission," said NNSY Operations Officer, Capt. Jip Mosman. "Not only will multiple shifts help with social distancing, they also provide flexibility to some of our shipyard parents while their children are out of school. Dedicated cleaning crews, along with every one of us cleaning as we go throughout the day, no matter what shift we are on or where we are located, will help prevent the spread of COVID-19 inside the shipyard. We must all work as a team to keep our shipyard virus free."
>
> Shipyard leadership and project teams have reengineered jobs whenever possible to practice social distancing while still conducting critical work. In the cases that is not

[145] Michael Brayshaw, "Minimizing the Spread, Maximizing the Mission: Norfolk Naval Shipyard Continues Service to the Fleet During COVID-19 Pandemic," *Navy News Service*, April 10, 2020.

> feasible and employees are within six feet of each other for prolonged periods, face masks and face shields will be used. COVID-19 specific Personal Protective Equipment (PPE) has been distributed to NNSY's USS George H.W. Bush (CVN 77), USS Wyoming (SSBN 742) and USS San Francisco (SSN 701) projects, with personnel being briefed on effective usage.
>
> Protecting the safety and health of shipyard project teams on the piers and dry docks is further benefitted by several new handwashing stations with foot pump faucets along the waterfront. Per guidance from the Centers of Disease Control and Prevention, handwashing is more effective than using hand sanitizer, which prompted attaining and installing these stations in close proximity to brows and project trailers. These stations will be serviced several times a week to replenish water, soap, and paper towels. John Schmeckenbecher, NNSY Port Operations Installation program director, said the handwashing stations are strategically located next to the projects and are similar to ones found at a carnival. "They don't take up much space, they are standalone and don't take any power," he said. "We put them where they are convenient for people to use."
>
> Random Health Measures have also begun at the shipyard, with ongoing spot checks throughout the installation where qualified personnel take employee temperatures and ask questions to ensure workforce members are not currently exhibiting any COVID-19 symptoms.
>
> Naval Facilities, Public Works Department Portsmouth, is currently coordinating expanded cleaning services at NNSY to include treating high-touch objects and locations with cleaning products effective at killing COVID-19.
>
> These are the latest in continued efforts safeguarding employee safety and health, a movement that began in March with NNSY assembling and distributing cleaning kits and producing hand sanitizer for the workforce so cleaning products would be readily available.
>
> "During this challenging time, shipyard leadership is doing everything in its power to ensure a safe work environment, protecting the safety and health of our coworkers, Ship's Force, and all those within America's Shipyard," said Shipyard Cmdr. Capt. Kai Torkelson. "This is just the start, and there are more steps to come. It's not going to be a sprint, it's going to be a marathon, and we have to keep up that endurance."[146]

Another April 10, 2020, press report stated that NNSY has

> put together a team to develop, manufacture and distribute cleaning and disinfecting kits to all its shops and codes.
>
> "Even though we have had no positive cases here at NNSY, we wanted to stay ahead of the curve," said Production Specialist Chris Hicks of the NNSY's recently re-establish Supply Department (Code 510.2). "For the health of the workforce, it is always better to be proactive than reactive."[147]

An April 7, 2020, press report stated:

> Newport News Shipbuilding officials say their employees at their Virginia shipyard have found interesting ways to keep with the spirit of social distancing while also keeping their shipbuilding programs on schedule.
>
> "Many of the jobs are one-man jobs, and six feet of social distancing is relatively easy to obtain. An aircraft carrier is a pretty big ship, and to spread a couple thousand people out on that, believe it or not, is not as hard as you would think. But there will always be jobs

[146] Norfolk Naval Shipyard Public Affairs, "Norfolk Naval Shipyard Works to Safeguard Employee Safety, Health During COVID-19 Pandemic," *Navy News Service*, April 10, 2020.

[147] Troy Miller, "Team Effort Arms Norfolk Naval Shipyard for Fight Against the Coronavirus," *Navy News Service*, April 10, 2020.

that will require individuals to do two-man jobs, and when we get to that point we have to think about the job differently," Lucas Hicks, vice president of new construction aircraft carrier programs, told USNI News in an interview last week.

"When you can't spread out, can you re-engineer your workspace? Sometimes it's nothing more than enlarging a work platform; where my staging was very small, can I make my staging a little bit larger? Or if I had a containment to keep the component clean, could I make the containment a little bit larger? Could I use a tool extension? Could I use a GoPro with all the right security considerations to allow an inspector to see what I'm seeing real-time but from a distance of more than six feet away?" Dru Branche, the shipyard's director of environmental, health and safety, said during the interview.

"And when you can't spread out, then you want to kind of practice some form of shielding, and can you do that with gloves, with clear face shields? … Can you use a sheet metal or a Lucite (clear acrylic) or a Herculite (fabric) barrier between you and your coworkers that allows you to stop the spread of those respirable droplets that are what really cause the disease to spread?"

Branche said the company has a liberal leave policy in place and that some people have already moved from the day shift to the night shift, which allows for better spacing in construction areas and in office buildings. Several thousands of employees are also teleworking full time or a couple days a week, further thinning out the volume of people moving around common areas of the shipyard each day.

On Tuesday [April 7], the shipyard reported 14 cases of COVID-19. Jennifer Boykin, president of Newport News Shipbuilding, told local news outlets the yard is recommending employees wear cloth masks in line with CDC guidance.

Hicks said the guidance health officials have given to the yard is to keep people six feet apart, and to limit time near one another to 15 minutes.

To achieve that, the workers are pulling tools out of the toolshed that allows them to work at greater distances. For example, many tools, such as grinders, have extenders that allow workers to access hard-to-reach spots on a ship.

"In normal circumstances, we would not employ such a device, but these are not normal circumstances. So we are looking at using existing tooling that gives us separation that we normally wouldn't use in that application, but because we have them and can use them, we'll apply them now in a different situation than we originally anticipated," Hicks said.

He added that workers are being asked to be mindful of their jobs and consider alternate ways to carry them out. For example, if two people are required because one person is performing a task and the other has to inspect at each step along the way, the yard has determined that the two workers likely don't need to be in a small space at the same time. Though it may slow down the work a bit, they've moved to one employee being in the space to perform a task and then stepping out before the inspector steps in.

Hicks noted an example from recent days, where three workers were supposed to be in a tent together, with the third person simply there for oversight.

"They said, well why don't you cut a window in the tent so they could stand outside the tent? So they put a clear window in it," Hicks said.

In select cases, the company is even allowing inspections to be done with the aid of GoPros and other camera gear.

"We are conservative in that approach, so if we believe it is a gray area then we're going to do the hands-on visual" inspection, Hicks stressed.

"But if it is second-party verification that … an instrument may be taking a temperature reading or a pressure reading and [we need] second-party verification of that, the first party

standing there doing it, the second party can do that effectively with a video assistant. No different. Now if it's a five-times visual inspection of a weld, we wouldn't do that with a video device, we would do that with eyes because we couldn't ensure the magnification of the video device and things like that. So some of it we can and some of it we cannot."

When there are no tools or workarounds to keep two people more than six feet apart, "where absolutely positively we can't get around it, we one, either stop the job and look for a window downstream to go do it – now, not knowing where the window is, looking downstream, is this a critical path job, is this not a critical path job, can we push this a few months from now and still meet our objectives? Some of the time that happens naturally. Some of the time is, no, let's put a respirator on and let's go work this with proper controls, engineered controls," Hicks said.

In these cases, the workers are outfitted with respirators, face shields, gloves, and other personal gear to keep them from picking up or spreading germs.

Hicks said most employees already have gloves and face shields as part of their standard tool package, used during tasks like grinding or sanding or other routine work. Not everyone has a respirator, since they have to be fit to the individual, but Newport News Shipbuilding has enough in its storage to take care of its workers in the event that workarounds are not possible and they need to be in close proximity to another colleague.

In fact, Hicks said of the respirators, "we stock and we have a good supplier and so on and so forth, to the point that we've leaned in and helped out with our local hospitals to get them some of the necessary supplies that we would have had on stock."

He said the yard also has a lot of Herculite tent material and clear Lucite that can be used for shielding, so there haven't been many big spends on gear to keep workers safe.

Hicks said the company has about 25,000 employees and that somewhere between 16,000 and 18,000 need to be in person at the yard.

To further spread out those people who need to remain at the yard for work, the company is trying to rebalance when work gets done. The yard typically runs a primary day shift and a much smaller back shift; Hicks said the company is trying to even out those numbers both to help out employees who may have children at home during the day now and to achieve the social distancing that health officials recommend.

"We are permitted to send entire crews to another shift by our collective bargaining agreement. But that's not our intent. That's just not our intention, we're really trying to come through how to go enact this in the right manner. There's a people piece of this that says, should you really go force someone onto the back shift? There's also a people piece of this that says, in order to increase social distancing, we need to force people into the back shift. And we're trying to come through what is the right way to deal with that," Hicks said.

He said he hopes they can achieve the right numbers voluntarily, but if they cannot get to the right people per square foot numbers they yard needs, then they may start ordering additional crews or individuals to alter their work hours.

Asked how long this beefed-up back shift will last, Hicks said it was hard to say at this point. The yard has been in touch with its sister yard, Ingalls Shipbuilding in Mississippi, as well as the General Dynamics Electric Boat yard in Connecticut that it partners with for submarine construction, to share ideas and best practices.

Hicks said the yard has modeled every scenario of how long this pandemic could last and how quickly the yard could resume its normal work hours, even modeling what it would look like to shut down altogether or to cease certain activities altogether.

"We've run every scenario. We have them all on the shelf ready to pull the trigger if we have to. We're just not there," in terms of committing to any particular scenario, though, Hicks said.

With so many unknowns, Hicks said it's also hard to guess what the schedule or cost impacts may be to the submarine and aircraft carrier construction programs taking place at Newport News Shipbuilding today.

"I think it's too early to think we have any schedule adjustments to make. Again, not knowing what tomorrow is, but it's too early to think we have any schedule adjustments to make yet. Not to say we won't. But we also are working with the various [Program Executive Offices] – I was on the phone with [PEO Carriers Rear Adm. Jim] Downey today, to make sure his priorities and my priorities are aligned and that I understand what the most important ship is, relative to aircraft carrier construction, for him. I know that my counterparts on the [Virginia-Class Submarine] team are doing the same with the submarine PEO … and all the way up to [Vice Adm. Tom] Moore at [Naval Sea Systems Command]."

Hicks said constant communication between the yard and its customers will ensure that available workers are put on the right projects, and that if something has to be sacrificed it's volume work and not critical path work that more directly determines a ship's delivery schedule. Once the workforce is back at 100 percent, he said, they can look at overtime and other options to make up volume work as needed.

The shipyard happened to be in the midst of a digitization effort, with the future aircraft carrier Enterprise set to be the first ship built from fully digital plans instead of paper drawings. This effort has actually made mass teleworking go smoother than expected in a lot of ways, Hicks said.

"We are much better prepared than I think many of our peers may be" because of moves the company has made in recent years. The company already has 11,000 laptops deployed and bought 500 more to support teleworking employees. Designers, engineers and planners can work from home full-time because of the digital ship plans. Others, like financial analysts, have been able to divide into a blue/gold teaming model so they're at work half the time and crunching numbers at home half the time, Hicks added.

Though the company has had some bandwidth limitations, and it realized early on it didn't have enough phone lines, Hicks said they're working through any challenges they encounter but are overall "in a much better spot" as a result of the move to digital. In fact, other than cleaning supplies, the additional laptops and network bandwidth have been the only real spending items for the company to support the yard's pandemic response.

Branche said the shipyard had bought a range of products, from cleaners to aerosols to fogs, to disinfect all kinds of work spaces….

Branche said it was hard to say how much more often spaces were being cleaned compared to usual, mostly because the employees themselves had begun wiping down bathroom countertops, door handles and other surfaces on their own, to keep themselves and their coworkers healthy.

She added the employees themselves had put up signs as well as marks on floors in places where people queue up – to get food, to get tools, to get drawings – and "just having the marking on the deck just kind of helps to say, oh yeah, this is where I have to stand," has been very helpful.

"I think the shipbuilders themselves are taking this seriously, they're leaning in and they're trying to give themselves visual reminders to stay safe," Hicks said.

> "The fact that they're leaning in like that is refreshing to me, as opposed to waiting for someone else to do it for them. They're really taking ownership of this situation and their own personal safety."[148]

Another April 7, 2020, press report stated:

> A civilian employee assigned to Submarine Maintenance Engineering, Planning and Procurement Activity at Portsmouth [New Hampshire] Naval Shipyard [PSNY] has died as a result of coronavirus complications, the U.S. Navy announced Monday [April 6]….
>
> Last week, Portsmouth Naval Shipyard officials would not answer questions about the possible presence of COVID-19 among its workforce of nearly 8,000, and instead directed inquiries to the DOD.
>
> A Navy spokesperson did say the PNSY workforce was being kept informed about positive cases of the coronavirus.
>
> PNSY employees who meet particular "high-risk" guidelines have been allowed to take administrative leave, per DOD guidance. Shipyard officials have also said about 20% of its workforce is currently working remotely.
>
> The Navy on Monday also issued new guidance requiring face coverings now be worn on DOD property, installations and facilities.[149]

An April 2, 2020, press report stated:

> General Dynamics Electric Boat on Thursday [April 2] reacted to criticism from Gov. Gina M. Raimondo the day before about working conditions at the nuclear-submarine builder.
>
> Electric Boat, which has shipyards at Quonset Point and in Groton, Connecticut, said it has reduced the "density of people in workspaces" and has allowed some to work remotely. It was unapologetic about not suspending work during the coronavirus crisis.
>
> Answering a question Wednesday [April 1] about working conditions at Electric Boat, Raimondo said she had learned of employees who are being required to work in closer contact than the six-foot rule of social distancing and in groups larger than five, which her office has mandated.
>
> In strong language, she said she would be calling the shipbuilder's executives to have them stop the practices.
>
> "It's not okay," Raimondo said. "You should not have to work in those conditions."
>
> On Thursday, Electric Boat issued a statement saying that some changes had been made.
>
> "Our team is working hard to make sure that our facilities are clean and safe — to ensure this is the case, we've increased cleaning in high traffic areas, have taken steps to reduce density of people in workspaces and are providing our employees with the maximum flexibility around working remotely where possible," the company said in a statement from spokeswoman Elizabeth Power.
>
> "Further, we are allowing our employees to advance their paid time off to allow them to be out of work without penalty at this challenging time."
>
> The statement noted, "Electric Boat must remain open, based on direction from the President, Department of Defense and U.S. Navy, which designate our company as part of

[148] Megan Eckstein, "How to Keep Social Distance When Building a Warship," USNI News, April 7, 2020.

[149] Hadley Barndollar (Portsmouth Herald), "Portsmouth Naval Shipyard Employee Dies of Coronavirus," *Stars and Stripes*, April 7, 2020. See also Josh Farley, "Puget Sound Naval Shipyard, Navy Bases Begin Requiring Masks," *Kitsap [WA] Sun*, April 6, 2020.

> the nation's critical infrastructure. This is not different for other defense contractors, including other companies based in Rhode Island, who support our national defense."[150]

An April 1, 2020, press report stated:

> The Navy's acquisition community is seeking to move work ahead of schedule and find as many efficiencies as possible, ahead of what could be a mountain of work to adjust contracts and try to keep programs on track once the effects of the COVID-19 pandemic are more fully understood, the Navy's top acquisition official said today.
>
> James Geurts said in a media roundtable today that, on top of their normal workload, his staff and program managers across the Navy would have to undertake "extra work sorting out all of these programs and contracts … this summer. So we are driving efficiency to create the bandwidth we're going to need, because there will be a fairly major effort this summer ensuring that we can fairly and reasonably adjust the programs based on the impacts we're seeing here."
>
> The assistant secretary of the Navy for research, development and acquisition said it was too early to tell exactly how many contract actions might be needed this summer to correct all the delays, contract breaches and other issues that may arise during the pandemic, but he did say that "the services side of business I don't think will be as drastic an impact as perhaps some of the major industrial operations. But we're going to have to work our way through it. That's why it was important for me … to baseline the programs and then we can more quickly sort out where do we need to make adjustments as we go forward."…
>
> "I hear stories of second-, third- and fourth-tier suppliers that were worried about going out of business, worried about how they would keep paying their salaries, and our ability to move and accelerate work into the defense base and then have that be pushed out to the suppliers is absolutely critical, because if they're not there it won't matter when we're ready to recover," Geurts said.
>
> "We need to make sure they're healthy and ready to roll as we accelerate out of recovery."
>
> In the past couple weeks alone, major shipyards have pushed hundreds of millions of dollars of work out into the supply base. Geurts said this was important during the pandemic because not all cities will be hit by the virus at the same time. With the disease potentially crippling different workforces at different times this year, "as individual suppliers and industrial operations deal with their local situation, they can do it knowing they've got work ready to go and then as soon as they're ready to go at their capacity, that work will be with them."
>
> At the program level, he said, this ability for lower-tier suppliers to forge ahead when and as they're able to will "enable us to create some resiliency in near-term delay and disruption, as well as enable us to accelerate recovery" and try to get programs back on track later on.[151]

Another April 1, 2020, press report stated:

> The U.S. Navy is continuing to build and repair ships amid the COVID-19 pandemic but also is looking ahead to position itself to accelerate as the nation recovers from the pandemic, the service's top acquisition official said.

[150] Edward Parker, "Electric Boat Changes Some Work Conditions in Face of Coronavirus," *Providence Journal*, April 2, 2020.

[151] Meagan Eckstein, "Navy Accelerating Contracts to Get Ahead of Upcoming Work to Address COVID-Related Program Disruptions," *USNI News*, April 1, 2020.

> The repair yards are "continuing to get the work done," James F. Geurts, assistant secretary of the Navy for research, development and acquisition, said during an April 1 teleconference with media.
>
> "We'll see some challenges," Geurts said, but noted that his office is focused on "one or two steps down the road" and on "how to accelerate out of recovery" to maintain the readiness of the fleet.
>
> He said that 95% to 98% of the Navy's acquisition work force is teleworking and that he "was not seeing a drop-off in performance."
>
> The assistant secretary reiterated his focus on three lines of operation:
>
> - The health of the defense industrial work force, including the government work force and its industrial partners such as prime contractors, subcontractors, small suppliers and individuals.
> - Ensuring the health of the industrial base.
> - Ensuring warfighting readiness of the Navy and U.S. Marine Corps.
>
> "We haven't slowed down," he said, and that the work force "is continuing to press hard."
>
> Geurts said he continues to see some tightening in the supply chain and that his workforce in continually reassessing measures to work out the challenges. He lately is focusing attention on the transportation and distribution networks to monitor potential disruptions in the supply chain.
>
> Geurts has been pressing to get contracts issued earlier than normal to assure the shipbuilders and repair yards and their suppliers that "work is coming."
>
> He pointed out that awarding contracts two months early has the advantage of getting planning and work started early; "creating some resiliency" as challenges arise; and making possible an acceleration of the post-pandemic recovery….
>
> He also said he has yet to see the impact of the pandemic on the next-generation frigate program.[152]

Another April 1, 2020, press report stated:

> The Navy is rushing to award several major shipbuilding contracts several months early to keep shipbuilders on the job and save smaller suppliers in danger of going out of business amid the wider manufacturing halt cause by the coronavirus crisis.
>
> The biggest is a contract to build the next San Antonio-class amphibious transport dock ship, (LPD 31) which serves as a jumping-off point for Marines heading ashore.
>
> The push to accelerate work is part of a wide-ranging effort to buttress the shipbuilding industry and the thousands of small suppliers that make parts for the Navy. The Navy's top acquisition official, James Geurts, told reporters Wednesday morning the Navy is worried about the effect the state and local shutdowns could have on its shipbuilding and repair efforts. "It's a national emergency and this is critical national infrastructure," so the issue is, "how do we orient quickly to get at this aggressively and try not to be reactive in nature."…
>
> "Nobody right now is in the position to float gaps," Geurts said. His staff has done a detailed analysis of the Navy's industrial base. They are looking for ways to help the smaller companies not only through moving forward orders, but also finding money for research and development that would help small, innovative companies.

[152] Richard R. Burgess, "Geurts: Ship Construction Ongoing, Repairs Continuing Amid COVID-19 Outbreak," *Seapower*, April 1, 2020.

"I hear stories of second-, third- and fourth-tier suppliers that were worried about going out of business, worried about how they would keep paying their salaries, and our ability to move and accelerate work into the defense base and then have that be pushed out to the suppliers is absolutely critical, because if they're not there it won't matter when we're ready to recover," Geurts said.

Geurts is gathering all of the large shipbuilders and shipyard owners several times a week to check on the status of the workforce and what problems they see coming if the current crisis continues.

At the center of these worries is the nation's largest shipbuilder, Huntington Ingalls, which is the only company that builds both Nimitz and Ford-class aircraft carriers, in addition to sharing work on Virginia-class submarines with Electric Boat.

The company has taken steps to attempt to apply social distancing at its shipyards, and has staggered shifts to accommodate workers who might now need to work different hours, company officials say.

In an interview earlier this week, several Huntington executives told me they've reached out to over 2,000 suppliers in 48 of the 50 US states, and are working to speed up and push contracts as far down the supply chain as possible to keep these small businesses running.

"We're gonna have to brave the storm together and especially some of the smaller suppliers," said Lucas Hicks, vice president of new construction aircraft carrier programs.

"We need their products today, but we also need them in 90 days, so we want to help them brave the storm," he added. "We've actually changed some payment terms on some of our supplier contracts to try to make sure that we can front them what they need to stay afloat. We're doing some creative stuff to try and help them be able to weather the storm."

The company hasn't seen any reduction in parts received yet, but acknowledges that the situation changes on a daily basis, as different parts of the country feel the pain of local shutdowns in different ways.

Lucas said Huntington does not anticipate it will stop work, but is allowing employees the option of working from home and providing liberal leave to others.

Eventually all of this "will have an impact," especially if the shutdowns are prolonged. "At some point, if it extends for months and months at the rate we're on, it would have an impact but it's too early to tell."

Geurts appears to see things the same way. The crisis and its downstream effects is "going to have both a time dimension and geography dimension, and so it will remain a fluid situation," when it comes to how much the defense industry, and the navy, are affected, Geurts said.[153]

[153] Paul McLeary, "Navy Rushes Shipbuilding Deals To Keep Yards Going In Pandemic," *Breaking Defense,* April 1, 2020. See also Marcus Weisgerber, "US Navy Speeds Weapon Buys To Keep Small Suppliers Afloat Amid Coronavirus," *Defense One*, April 1, 2020; Justin Katz, "Geurts Projects 'Major Effort' This Summer to Correct for Program, Contract Issues Caused by COVID-19," *Inside Defense,* April 1, 2020.

Author Information

Ronald O'Rourke
Specialist in Naval Affairs

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