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Navy LPD-17 Flight II Amphibious Ship Program: Background and Issues for Congress

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Summary

The Navy wants to procure a total of 13 LPD-17 Flight II amphibious ships. LPD-17 Flight II ships cost roughly $1.8 billion each to procure. The first LPD-17 Flight II ship, LPD-30, was procured in FY2018. As part of its action on the Navy's proposed FY2019 budget, Congress provided $350 million in unrequested advance procurement (AP) funding for a second LPD-17 Flight II ship, LPD-31, to be procured in FY2020. This was consistent with the Navy's FY2019 budget submission, under which LPD-31 was planned for procurement in FY2020 and the remainder of its procurement cost was to be requested in FY2020. The Navy's FY2020 budget submission, however, proposes deferring the procurement of LPD-31 by one year, to FY2021, and the Navy's proposed FY2020 budget, rather than requesting the remainder of LPD-31's procurement cost, instead requests $247.1 million in AP funding for the ship.

Navy officials state that if no LPD-17 Flight II ship is procured in FY2020, the $350 million in FY2019 AP funding that Congress provided for the LPD-17 program would become unexecutable, because that funding was provided specifically for use in building an LPD-17 Flight II ship procured in FY2020, not an LPD-17 Flight II ship procured in FY2021. The $350 million in FY2019 AP funding can be made executable by procuring LPD-31 in FY2020 or by passing legislation permitting the FY2019 AP funding to be used for an LPD-17 Flight II ship procured in FY2021. One alternative for procuring LPD-31 in FY2020 would be to do so with full funding (i.e., with the remainder of the ship's procurement cost provided in FY2020). Another alternative would be to pass legislation giving the Navy the authority to procure LPD-31 in FY2020 using incremental funding. Navy officials state that under the latter alternative, the amount of procurement funding needed for LPD-31 in FY2020 would be, at a minimum, roughly $200 million, and not more than the requested amount of $247.1 million.

As part of its action on the Navy's proposed FY2019 budget, Congress also provided $350 million in unrequested AP funding for a different kind of amphibious ship—an amphibious assault ship called LHA-9. This ship is considerably larger and more expensive than an LPD-17 Flight II ship. The Navy's FY2020 budget submission estimates LHA-9's procurement cost at $4,076.4 million (i.e., about $4.1 billion). Under the Navy's FY2019 budget submission, LHA-9 was planned for procurement in FY2024. The $350 million in FY2019 AP funding that Congress provided was intended to encourage the Navy to accelerate the procurement of LHA-9 from FY2024 to an earlier fiscal year, such as FY2020 or FY2021. Under the Navy's FY2020 budget submission, the Navy continues to show LHA-9 as a ship planned for procurement in FY2024, and the Navy's proposed FY2020 budget does not request any additional procurement or AP funding for the ship.

Issues for Congress include whether to procure LPD-31 in FY2020 or FY2021; whether to procure LPD-31 (if it is procured in FY2020) with full funding or incremental funding; the amount of procurement or AP funding to provide for LPD-31 and LHA-9 in FY2020; more generally whether the Navy is placing too much, too little, or about the right amount of emphasis on amphibious ships in its FY2020 budget submission, particularly compared to other Navy shipbuilding programs; and technical risk in the LPD-17 Flight II and LHA programs.

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Introduction

This report provides background information and issues for Congress on the LPD-17 Flight II amphibious ship program. The Navy's FY2020 budget submission defers the planned procurement of the second LPD-17 Flight II ship, LPD-31, by one year, to FY2021, and requests $247.1 million in advance procurement (AP) funding for the ship.

This report also discusses LHA-9, a different kind of amphibious ship that the Navy wants to procure in FY2024. The Navy's proposed FY2020 budget does not request any procurement or AP funding for this ship.

Issues for Congress include whether to procure LPD-31 in FY2020 or FY2021; whether to procure LPD-31 (if it is procured in FY2020) with full funding or incremental funding; the amount of procurement or AP funding to provide for LPD-31 and LHA-9 in FY2020; and more generally whether the Navy is placing too much, too little, or about the right amount of emphasis on amphibious ships in its FY2020 budget submission, particularly compared to other Navy shipbuilding programs. Congress's decisions on these issues could affect Navy capabilities and funding requirements and the shipbuilding industrial base.

For an overview of the strategic and budgetary context in which the LPD-17 Flight II program and other Navy shipbuilding programs may be considered, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

Background

Amphibious Ships in General

Roles and Missions

Navy amphibious ships are operated by the Navy, with crews consisting of Navy personnel. The primary function of Navy amphibious ships is to lift (i.e., transport) embarked U.S. Marines and their equipment and supplies to distant operating areas, and enable Marines to conduct expeditionary operations ashore in those areas. Although amphibious ships are designed to support Marine landings against opposing military forces, they are also used for operations in permissive or benign situations where there are no opposing forces. Due to their large storage spaces and their ability to use helicopters and landing craft to transfer people, equipment, and supplies from ship to shore without need for port facilities,[1] amphibious ships are potentially useful for a range of combat and noncombat operations.[2]

[1] Amphibious ships have berthing spaces for Marines; storage space for their wheeled vehicles, their other combat equipment, and their supplies; flight decks and hangar decks for their helicopters and vertical take-off and landing (VTOL) fixed-wing aircraft; and well decks for storing and launching their landing craft. (A well deck is a large, garage-like space in the stern of the ship. It can be flooded with water so that landing craft can leave or return to the ship. Access to the well deck is protected by a large stern gate that is somewhat like a garage door.)

[2] Amphibious ships and their embarked Marine forces can be used for launching and conducting humanitarian-assistance and disaster-response (HA/DR) operations; peacetime engagement and partnership-building activities, such as exercises; other nation-building operations, such as reconstruction operations; operations to train, advise, and assist foreign military forces; peace-enforcement operations; noncombatant evacuation operations (NEOs); maritime-security operations, such as anti-piracy operations; smaller-scale strike and counter-terrorism operations; and larger-scale ground combat operations. Amphibious ships and their embarked Marine forces can also be used for maintaining

On any given day, some of the Navy's amphibious ships, like some of the Navy's other ships, are forward-deployed to various overseas operating areas. Forward-deployed U.S. Navy amphibious ships are often organized into three-ship formations called amphibious ready groups (ARGs).[3] On average, two or perhaps three ARGs might be forward-deployed at any given time. Amphibious ships are also sometimes forward-deployed on an individual basis to lower-threat operating areas, particularly for conducting peacetime engagement activities with foreign countries or for responding to smaller-scale or noncombat contingencies.

Types of Amphibious Ships

Navy amphibious ships can be divided into two main groups—the so-called "big-deck" amphibious assault ships, designated LHA and LHD, which look like medium-sized aircraft carriers, and the smaller (but still sizeable) amphibious ships designated LPD or LSD, which are sometimes called "small-deck" amphibious ships.[4] The LHAs and LHDs have large flight decks and hangar decks for embarking and operating numerous helicopters and vertical or short takeoff and landing (V/STOL) fixed-wing aircraft, while the LSDs and LPDs have much smaller flight decks and hangar decks for embarking and operating smaller numbers of helicopters. The LHAs and LHDs, as bigger ships, in general can individually embark more Marines and equipment than the LSDs and LPDs.

Amphibious Lift Goal

The Navy's 355-ship force-level goal, released in December 2016, calls for achieving and maintaining a 38-ship amphibious force that includes 12 LHA/LHD-type ships, 13 LPD-17 class ships, and 13 LSD/LPD-type ships (12+13+13).[5] The goal for achieving and maintaining a force of 38 amphibious ships relates primarily to meeting wartime needs for amphibious lift. Navy and Marine Corps officials have testified that fully meeting U.S. regional combatant commander requests for day-to-day forward deployments of amphibious ships would require a force of 50 or more amphibious ships.[6]

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forward-deployed naval presence for purposes of deterrence, reassurance, and maintaining regional stability.

[3] An ARG notionally includes three amphibious ships—one LHA or LHD, one LSD, and one LPD. These three amphibious ships together can embark a Marine expeditionary unit (MEU) consisting of about 2,200 Marines, their aircraft, their landing craft, their combat equipment, and about 15 days' worth of supplies. ARGs can operate in conjunction with carrier strike groups (CSGs) to form larger naval task forces; ARGs can also be broken up into individual ships that are sent to separate operating areas.

[4] U.S. Navy amphibious ships have designations starting with the letter L, as in amphibious *landing*. LHA can be translated as landing ship, helicopter-capable, assault; LHD can be translated as landing ship, helicopter-capable, well deck; LPD can be translated as landing ship, helicopter platform, well deck; and LSD can be translated as landing ship, well deck. Whether noted in the designation or not, almost all these ships have well decks. The exceptions are LHAs 6 and 7, which do not have well decks and instead have expanded aviation support capabilities. For an explanation of well decks, see footnote 1.

[5] For more on the Navy's 355-ship force-level goal, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke. For a more detailed review of the 38-ship force structure requirements, see Appendix A of CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, which is an archived report.

[6] For example, in testimony to the Seapower and Projection Forces subcommittee of the House Armed Services Committee on February 25, 2015, Marine Corps Lieutenant General Kenneth J. Glueck, Jr., Deputy Commandant for Combat Development and Integration and Commanding General of the Marine Corps Combat Development Command, stated that the number needed to fully meet regional combatant commander demands for forward-deployed amphibious ships is "close to 54." (Source: Spoken testimony of Lieutenant General Glueck, as reflected in transcript of hearing.)

Current and Projected Force Levels

The Navy's force of amphibious ships at the end of FY2018 included 32 ships, including 9 amphibious assault ships (1 LHA and 8 LHDs), 11 LPD-17 Flight I ships, and 12 LSD-41/49 class ships. The LSD-41/49 class ships, which are the ships to be replaced by LPD-17 Flight II ships, are discussed in the next section.

The Navy's FY2020 30-year (FY2020-FY2049) shipbuilding plan projects that the Navy's force of amphibious ships will increase gradually to 38 ships by FY2026, remain at a total of 36 to 38 ships in FY2027 to FY2034, decline to 34 or 35 ships in FY2035-FY2038, increase to 36 or 37 ships in FY2039-FY2046, and remain at 35 ships in FY2047-FY2049. Over the entire 30-year period, the force is projected to include an average of about 35.8 ships, or about 94% of the required figure of 38 ships, through resulting amount of lift capability provided by the ships would not necessarily equate to about 94% of the amphibious lift goal, due to the mix of ships in service at any given moment and their individual lift capabilities.

Existing LSD-41/49 Class Ships

The Navy's 12 aging Whidbey Island/Harpers Ferry (LSD-41/49) class ships (**Figure 1**) were procured between FY1981 and FY1993 and entered service between 1985 and 1998.[7] The class includes 12 ships because they were built at a time when the Navy was planning a 36-ship (12+12+12) amphibious force. They have an expected service life of 40 years; the first ship will reach that age in 2025. The Navy's FY2020 30-year shipbuilding plan projects that the 12 ships will retire between FY2026 and FY2038.

LPD-17 Flight II Program

Program Name

The Navy decided in 2014 that the LSD-41/49 replacement ships would be built to a variant of the design of the Navy's San Antonio (LPD-17) class amphibious ships. (A total of 13 LPD-17 class ships [LPDs 17 through 29] were procured between FY1996 and FY2017.) Reflecting that decision, the Navy announced on April 10, 2018, that the replacement ships would be known as the LPD-17 Flight II ships.[8] By implication, the Navy's original LPD-17 design became the LPD-17 Flight I design.

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[7] The class was initially known as the Whidbey Island (LSD-41) class. The final four ships in the class, beginning with *Harpers Ferry* (LSD-49), were built to a modified version of the original LSD-41 design, prompting the name of the class to be changed to the Harpers Ferry/Whidbey Island (LSD-41/49) class. Some sources refer to these 12 ships as two separate classes. The first three were built by Lockheed Shipbuilding of Seattle, WA, a firm that subsequently exited the Navy shipbuilding business. The final nine were built by Avondale Shipyards of New Orleans, LA, a shipyard that eventually became part of the shipbuilding firm Huntington Ingalls Industries (HII). Avondale, like Lockheed Shipbuilding, no longer builds Navy ships. HII wound down Navy shipbuilding operations at Avondale in 2014, after Avondale finished building LPD-25, the ninth LPD-17 class ship. HII continues to operate two other shipyards that build Navy ships—Ingalls Shipbuilding in Pascagoula, MS (HII/Ingalls), and Newport News Shipbuilding in Newport News, VA (HII/NNS). HII's construction of amphibious ships, previously divided between Avondale and Ingalls, now takes place primarily at Ingalls.

[8] Megan Ecsteain, "Navy Designates Upcoming LX(R) Amphibs as San Antonio-Class LPD Flight II," *USNI News*, April 11, 2018. Within a program to build a class of Navy ships, the term *flight* refers to a group of ships within the class that are built to a particular version of the class design. The LPD-17 Fight II program was previously known as the LX(R) program. In the designation LX(R), the X meant that the exact design of the ship had not yet been determined, and the R meant that the ships are intended as replacements for the LSD-41/49 class ships. Prior to being

Figure 1. LSD-41/49 Class Ship

Source: U.S. Navy photo accessed May 7, 2014, at http://www.navy.mil/gallery_search_results.asp?terms=lsd+52&page=4&r=4. The Navy's caption for the photo states that the photo is dated July 13, 2013, and that it shows the *Pearl Harbor* (LSD-52) anchored off Majuro atoll in the Republic of the Marshall Islands during an exercise called Pacific Partnership 2013.

The first LPD-17 Flight II ship is designated LPD-30. Subsequent LPD-17 Flight II ships are to be designated LPD-31, LPD-32, and so on. Whether the LPD-17 Flight II ships constitute their own shipbuilding program or an extension of the original LPD-17 shipbuilding program might be a matter of perspective. As a matter of convenience, this CRS report refers to the Flight II shipbuilding effort as a separate program. Years from now, LPD-17 Flight I and Flight II ships might come to be known collectively as either the LPD-17 class, the LPD-17/30 class, or the LPD-17 and LPD-30 classes.

Design

Compared to the LPD-17 Flight I design, the LPD-17 Flight II design (**Figure 2**) is somewhat less expensive to procure, and in some ways less capable—a reflection of how the Flight II design was developed to meet Navy and Marine Corps operational requirements while staying within a unit procurement cost target that had been established for the program.[9] In many other respects,

referred to as the LX(R) program, the program was referred to as the LSD(X) program, meaning an LSD-type ship whose design had not yet been determined. The program's designation was changed to LX(R) in 2012 to signal that the replacement for the existing LSD-41/49 class ships would be an amphibious ship that would best meet future Navy and Marine Corps needs, regardless of whether that turned out to be a ship that one might refer to as an LSD. For an article discussing this earlier change in the program's designation, see Christopher P. Cavas, "Different Missions Might Await New USN Amphib," *Defense News*, November 12, 2012.

[9] The Navy's unit procurement cost targets for the LPD-17 Flight II program were $1,643 million in constant FY2014 dollars for the lead ship, and an average of $1,400 million in constant FY2014 dollars for ships 2 through 11. (Source: Navy briefing on LX(R) program to CRS and CBO, March 23, 2015.) The cost target for the lead ship was greater than the cost target for the subsequent ships primarily because the procurement cost of the lead ship incorporates much or all of the detail design and nonrecurring engineering (DD/NRE) costs for the program. Incorporating much or all of the

however, the LPD-17 Flight II design is similar in appearance and capabilities to the LPD-17 Flight I design. Of the 13 LPD-17 Flight I ships, the final two (LPDs 28 and 29) incorporate some design changes that make them transitional ships between the Flight I design and the Flight II design.

Figure 2. LPD-17 Flight II Design

Artist's rendering

Source: Huntington Ingalls Industries rendering accessed April 22, 2019, at https://www.huntingtoningalls.com/lpd-flight-ii/.

Procurement Quantity

Consistent with the Navy's 38-ship amphibious force-level goal, the Navy wants to procure a total of 13 LPD-17 Flight II ships.

Procurement Schedule

The first LPD-17 Flight II ship, LPD-30, was procured in FY2018. Under the Navy's FY2019 budget submission, the second LPD-17 Flight II ship, LPD-31, was to be procured in FY2020,[10] and the remaining 11 were to be procured at a rate of one per year starting in FY2022. The Navy's FY2020 budget submission proposes deferring the procurement of LPD-31 to FY2021 and the procurement of the third ship (LPD-32) to FY2023, with the final 10 ships to be procured at a rate of one per year starting in FY2025. As shown in **Table 1**, when compared to the Navy's

DD/NRE costs of for a shipbuilding program into the procurement cost of the lead ship in the program is a traditional Navy shipbuilding budgeting practice.

[10] The Navy had planned to procure the first LPD-17 Flight II ship in FY2020. Congress, as part of its action on the Navy's proposed FY2018 budget, accelerated the procurement of the first LPD17 Flight II ship to FY2018. The Navy's FY2019 budget submission, which was submitted before Congress finalized its action on the Navy's FY2018 budget, programmed the procurement of an LPD-17 Flight II ship in FY2020. Under the Navy's original plan, the ship programmed for procurement in FY2020 was to be the first Flight II ship. With the first Flight II ship having been procured in FY2018, the Flight II ship scheduled for procurement in FY2020 became the second Flight II ship.

FY2019 budget submission, the Navy's FY2020 budget submission reduces from four to two the total number of LPD-17 Flight II ships to be procured during the period FY2020-FY2024.

Table 1. LPD-17 Flight II Annual Procurement Quantities for FY2020-FY2024

As shown in Navy's FY2019 and FY2020 budget submissions

Budget Submission	FY20	FY21	FY22	FY23	FY24	FY20-FY24 Total
FY2019 submission	1	0	1	1	1	4
FY2020 submission	0	1	0	1	0	2

Source: Table prepared by CRS based on Navy's FY2019 and FY2020 budget submissions.

Procurement Cost

Under the Navy's FY2020 budget submission, LPD-17 Flight II ships cost roughly $1.8 billion each to procure.

Program Funding

Table 2 shows LPD-17 Flight II procurement and advance procurement (AP) funding for FY2020-FY2024 as presented in the Navy's FY2020 budget submission.

Table 2. LPD-17 Flight II Funding for FY2020-FY2024

Millions of dollars, rounded to nearest tenth

	FY20 (req.)	FY21 (proj.)	FY22 (proj.)	FY23 (proj.)	FY24 (proj.)
Procurement	0	1,590.9	0	1,738.9	0
Advance procurement (AP)	247.1	0	0	0	0
Total	247.1	1,590.9	0	1,738.9	0
(Procurement quantity)	*(0)*	*(1)*	*(0)*	*(1)*	*(0)*

Source: Table prepared by CRS based on Navy's FY2020 budget submission.

LHA-9 Amphibious Assault Ship

The most recently procured LHA/LHD-type amphibious assault ship is LHA-8 (**Figure 3**), which was procured in FY2017 and is scheduled under the Navy's FY2020 budget submission to be delivered in January 2024.

The Navy wants to procure the next LHA/LHD-type ship, LHA-9, in FY2024. LHA/LHD-type ships are considerably larger and more expensive than LPDs. The Navy's FY2020 budget submission estimates LHA-9's procurement cost at $4,076.4 million (i.e., about $4.1 billion).

Some in Congress and elsewhere are interested in the potential for accelerating the procurement of LHA-9 from FY2024 to an earlier year, such as FY2020 or FY2021, in part to achieve better production learning curve benefits in shifting from production of LHA-8 to LHA-9 and thereby reduce LHA-9's procurement cost in real (i.e., inflation-adjusted) terms. For example, the Senate Armed Services Committee's report (S.Rept. 115-262 of June 5, 2018) on the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (S. S. 2987) stated:

> The committee remains concerned with the Navy procurement profile for large deck amphibious assault ships, which includes a span of 7 years until the next large deck amphibious assault ship (LHA–9) is procured in 2024.
>
> The committee notes that efficiencies could be gained by reducing this span, which could enable a steadier workforce with an increased learning curve, material and equipment suppliers on more reliable and fixed delivery contracts, and a more effective continuous improvement schedule.
>
> The committee urges the Secretary of the Navy to accelerate procurement of LHA–9 to not later than 2021…. (Pages 82-83)[11]

Figure 3. LHA-8 Amphibious Assault Ship

Artist's rendering

Source: Photo accompanying Tyler Rogoway, "The Next America Class Amphibious Assault Ship Will Almost Be In a Class of its Own," The Drive, April 17, 2018. A note on the photo credits the photo to HII.

As part of its action on the Navy's proposed FY2019 budget, Congress provided $350 million in unrequested AP funding for LHA-9, in part to encourage the Navy to accelerate the procurement of LHA-9 from FY2024 to an earlier fiscal year, such as FY2020 or FY2021.

Under the Navy's FY2020 budget submission, the Navy continues to show LHA-9 as a ship planned for procurement in FY2024, and the Navy's proposed FY2020 budget does not request any additional procurement or AP funding for the ship. Consistent with past practice for procuring LHA/LHD-type amphibious ships, the Navy's FY2020 budget submission anticipates using two-year incremental funding (i.e., split funding) to procure LHA-9, with the bulk of the ship's procurement cost to be divided between FY2024 and FY2025. **Table 3** shows FY2020-FY2024 funding for the ship under the Navy's FY2020 budget submission.

[11] See also Mallory Shelbourne, "HII Ready to Accelerate LHA-9 Construction Three Years Ahead of Navy Schedule," *Inside Defense*, March 15, 2019.

Table 3. LHA-9 Funding for FY2020-FY2024

Millions of dollars, rounded to nearest tenth

	FY20 (req.)	FY21 (proj.)	FY22 (proj.)	FY23 (proj.)	FY24 (proj.)
Procurement	0	0	0	0	1,617.8
Advance procurement (AP)	0	0	0	170.6	0
Total	0	0	0	170.6	1,617.8
(Procurement quantity)	*(0)*	*(0)*	*(0)*	*(0)*	*(1)*

Source: Table prepared by CRS based on Navy's FY2020 budget submission.

Amphibious Warship Industrial Base

Huntington Ingalls Industries/Ingalls Shipbuilding (HII/Ingalls) of Pascagoula, MS, is the Navy's current builder of both LPDs and LHA/LHD-type ships, although other U.S. shipyards could also build amphibious ships.[12] The amphibious warship industrial base also includes many supplier firms in numerous U.S. states that provide materials and components for Navy amphibious ships. HII states that the supplier base for its LHA production line, for example, includes 457 companies in 39 states.[13]

Issues for Congress

FY2020 Procurement and Funding Issues

FY2020 procurement and funding issues for Congress for FY2020 include the following:

- whether to procure LPD-31 in FY2020 or FY2021;
- whether to procure LPD-31 (if it is procured in FY2020) with full funding or incremental funding;
- the amount of procurement or AP funding to provide for LPD-31 and LHA-9 in FY2020; and
- more generally whether the Navy is placing too much, too little, or about the right amount of emphasis on amphibious ships in its FY2020 budget submission, particularly compared to other Navy shipbuilding programs.

Regarding the first issue above, supporters of procuring LPD-31 in FY2020 could argue that it could put the Navy on a path to achieving the 38-ship amphibious ship force-level goal sooner than FY2026, permit the $350 million in AP funding that Congress provided for the program in FY2019 to be executed as intended, and leave more budgetary room in FY2021 for funding other Navy programs. Supporters of procuring LPD-31 in FY2021 could argue that FY2026 is an acceptable date for achieving the 38-ship amphibious ship force-level objective, particularly

[12] Amphibious ships could also be built by U.S. shipyards such as HII/Newport News Shipbuilding (HII/NNS) of Newport News, VA; General Dynamics/National Steel and Shipbuilding Company (GD/NASSCO) of San Diego, CA; and (for LPDs at least) General Dynamics/Bath Iron Works (GD/BIW) of Bath, ME. The Navy over the years has from time to time conducted competitions among shipyards for contracts to build amphibious ships.

[13] Source: HII statement as quoted in Frank Wolfe, "Navy Budget Plan Delays Buy of Amphibious Ships," *Defense Daily*, March 15, 2019.

given the challenges the Navy faces for meeting some of its other force-level goals in coming years (such as those for attack submarines and aircraft carriers); that in a situation of finite Navy or Department of Defense (DOD) funding, procuring LPD-31 in FY2020 might require reductions in funding for other Navy or DOD programs, with an uncertain net result on Navy or DOD capabilities; and that Congress can make the FY2019 AP funding executable by passing legislation permitting the funding to be used on an LPD-17 Flight II ship procured in FY2021.

Regarding the second issue above, supporters of procuring LPD-31 with full funding could argue that it would leave more budgetary room in FY2021 and perhaps one or more years beyond that for funding other Navy programs, and that Navy surface ships other than aircraft carriers and LHA/LHD-type amphibious assault ships have generally been procured with full funding rather than incremental funding. Supporters of funding LPD-31 with incremental funding could argue that doing so would reduce FY2020 funding needs for LPD-31, preserving more FY2020 funding for other Navy or DOD programs, and that there have been a few instances over the years in which Navy surface ships other than aircraft carriers and LHA/LHD-type amphibious assault ships have been procured with incremental funding.

Regarding the third issue above, factors that Congress may consider include whether the Navy has properly scheduled and accurately estimated the work on these ships it is proposing to do in FY2020, and how the type and amount of work to be done on these ships in FY2020 would change if LPD-31 were procured in FY2020 instead of FY2021, and if procurement of LHA-9 were accelerated from FY2024 to an earlier fiscal year, such as FY2020 or FY2021.

Regarding the fourth issue above, supporters of amphibious ships might argue that by deferring the procurement of LPD-31 to FY2021, reducing the number of LPD-17 Flight II ships to be procured in FY2020-FY2024, and not accelerating the procurement of LHA-9 from FY2024 to an earlier fiscal year, the Navy's FY2020 budget submission is placing a reduced emphasis on amphibious ships in its shipbuilding plans, particularly compared to other type of Navy ships, such as attack submarines, destroyers, and frigates, all of which experienced additions or accelerations in FY2020 or FY2021 under the Navy's FY2020 budget submission.[14] Amphibious ships, they could argue, are as important as these other types of ships, and are in high demand by U.S. regional combatant commanders. Other observers, while acknowledging the value of amphibious ships, might argue that within a finite Navy budget, the Navy needs to make difficult choices about what type of ships to procure; that attack submarines, destroyers, and frigates are critical for countering China's improving naval capabilities and for performing other missions; and that the Navy currently has substantial shortfalls in attack submarines, large surface combatants (such as destroyers), and small surface combatants (such as frigates) relative to its force-level goals for those types of ships.

A Navy information paper on options for funding the procurement of LPD-31 (the second LPD-17 Flight II ship) states:

> **QUESTION:** Explain the end cost to build LPD 31 under the following conditions:
>
> a. FY19 ($350M), FY20 ($247M), and FY21 funding are all available
>
> b. FY19 ($350M) and FY21 funding are available (FY20 $247M is not available)
>
> c. Only FY20 ($247M) and FY21 funding are available (FY19 $350M is not available)

[14] See, for example, Megan Eckstein, "LPD Flight II Amphib Delayed in Favor of 3rd Attack Sub in FY 2020," *USNI News*, March 14, 2019; Frank Wolfe, "Navy Budget Plan Delays Buy of Amphibious Ships," *Defense Daily*, March 15, 2019.

RESPONSE:…

Scenarios:

Option (a) represents the most affordable scenario with no increase in end cost. This scenario assumes access to FY19 Advance Procurement (AP) funds in the Summer 2019 to initiate LPD 31 LLTM procurements, which will mitigate inflation impacts. The funding may also be used to leverage Government Furnished Equipment (GFE) quantity buys. This most affordable scenario assumes incremental funding authority and the appropriation of FY20 as Full Funding with the balance in FY21. That approach would enable the Navy to put LPD 31 under contract in FY20 and start construction on the optimized 18-month center. The authority to proceed to proposal, negotiations, and award earlier will maximize the ability to leverage the recently awarded LPD 30 and mitigate the impacts associated with a delayed contract negotiation and award timeline.

Option (b) represents the medium-cost scenario with a potential end cost increase of ~2% relative to the PB19 profile. This scenario assumes access to FY19 AP funds in the Summer 2019 to initiate LPD 31 LLTM procurements and may also be used to leverage GFE quantity buys. The construction contract would be awarded upon authorization and appropriation of the FY21 ship. Although this scenario may allow the shipbuilder to start LPD 31 construction on the optimized 18-month center and minimize loss of learning relative to prior ships, it carries the potential for inflation impacts and increased overhead rates. Additionally, the contractor may include increased risk in their LPD 31 pricing depending on shipyard loading, future business projections, and lessons learned from ships currently in production.

Option (c) represents the most costly scenario with a potential end cost increase of ~6% relative to the PB19 profile. This scenario assumes that LPD 31 LLTM procurement would not begin until the FY20 authorization and appropriations bills are enacted. The construction contract would be awarded upon authorization and appropriation of the FY21 ship. Due to LLTM requirements, ship construction would start at least 6-9 months later than the optimal 18-month centers (i.e. 24+ months after LPD 30). This scenario also introduces the potential for additional inflation impacts, increased overhead rates, and loss of learning.[15]

Technical Risk in LPD-17 Flight II and LHA Programs

Another potential issue for Congress is technical risk in the LPD-17 Flight II and LHA programs. A May 2019 Government Accountability Office (GAO) report—the 2019 edition of GAO's annual report surveying DOD major acquisition programs—states the following about the LPD-17 Flight II program:

Current Status

The Navy planned to accelerate purchase of LPD 30—the first fully configured Flight II ship—after Congress appropriated $1.8 billion above the fiscal year 2018 budget request, according to program officials. The Navy reported that it awarded contracts in August 2018 for LPD 30 long lead time materials and in March 2019 for lead ship construction.

The Navy based the Flight II design on Flight I, with modifications to reduce costs and meet new requirements. According to program officials, roughly 200 design changes will distinguish the two flights including replacing the composite mast with a steel stick. Officials stated that the design would not rely on any new technologies. However, the Navy plans to install a new radar, the Enterprise Air Surveillance Radar, which is still in development. The Navy expects live radar system testing through November 2019, with a

[15] Navy information paper dated June 4, 2019, received from Navy Office of Legislative Affairs on June 7, 2019.

complete radar prototype in February 2020. Although program officials consider these activities to be low risk, the Navy will make its decision to begin ship construction by December 2019 without incorporating lessons learned from radar testing into the design. Starting construction before stabilizing the design could require the Navy to absorb costly design changes and rework during ship construction.

The Navy initially pursued a limited competition for LX(R), but now has a non-competitive acquisition strategy for LPD 17 Flight II. The Navy plans to award sole-source contracts to Huntington Ingalls—the only shipbuilder of Flight I ships—for Flight II construction. Further, the program did not request a separate independent cost estimate for Flight II prior to awarding the LPD 30 detail design and construction contract. At the same time, the Navy identified no plans to establish a cost baseline specific to Flight II. Without this baseline, the Navy would report full LPD 17 program costs—rather than Flight II specific costs—constraining visibility into Flight II.

Program Office Comments

We provided a draft of this assessment to the program office for review and comment. The program office provided technical comments, which we incorporated as appropriate The program office stated that LPD Flight II is included under the existing LPD 17 acquisition program baseline, and that no other viable contractor responded to a public notice regarding the Navy's plan to award Huntington Ingalls the LPD 30 construction contract.[16]

The May 2019 GAO report stated the following about the LHA program:

Current Status

In June 2017, the Navy exercised a contract option for detail design and construction of the LHA 8. The LHA 8 incorporates significant design changes from earlier ships in the LHA 6 class, but Navy officials were unable to quantify the changes. The Navy started construction in October 2018 and LHA 8 is scheduled to be delivered in January 2024.

The LHA 8 program office has not identified any critical technologies. However, the ship is relying on technology that is currently being developed by another Navy program, the Enterprise Air Surveillance Radar (EASR), with delivery expected in August 2021. EASR, intended to provide self-defense and situational awareness capabilities, is derived from the pre-existing Air and Missile Defense Radar program, but will be a different size and will rotate. LHA 8 program officials have identified the radar as the program's highest development risk. If the radar is not delivered on schedule, Navy officials report that this could lead to out-of-sequence design and delayed installation and testing. Officials responsible for developing the radar, however, stated that the radar is approaching maturity and is on schedule to be delivered to the shipbuilder when needed.

The Navy began construction with about 61 percent of the LHA 8 product model completed—an approach inconsistent with shipbuilding best practices. These best practices call for 100 percent completion of 3D product modeling prior to construction start to minimize the likelihood of costly re-work and out of sequence work that can drive schedule delays. The Navy, however, estimates that the LHA 8 shipbuilder will not complete 100 percent of the ship's 3D product model until June 2019, almost 8 months after the start of construction.

Program Office Comments

We provided a draft of this assessment to the program office for review and comment. The program office provided technical comments, which we incorporated where appropriate.

[16] Government Accountability Office, Weapon Systems Annual Assessment, *Limited Use of Knowledge-Based Practices Continues to Undercut DOD's Investments*, GAO-19-336SP, May 2019, p. 134.

> The program office stated that the Navy understands all design changes incorporated on the LHA 8, such as reintroducing the well deck and incorporating EASR. According to the program office, the Navy does not begin construction on any section of the LHA 8 ship before completing that respective section's design.[17]

Legislative Activity for FY2020

Summary of Congressional Action on FY2020 Funding Request

Table 4 summarizes congressional action on the Navy's FY2020 funding request for the LPD-17 Flight II and LHA-9 programs.

Table 4. Summary of Congressional Action on FY2020 Funding Request

Millions of dollars, rounded to nearest tenth

		Authorization			Appropriation		
	Request	HASC	SASC	Conf.	HAC	SAC	Conf.
LPD-17 Flight II program							
Procurement	0		525.0		0		
Advance procurement (AP)	247.1		0		0		
(Procurement quantity)	*(0)*		*(1)*		*(0)*		
LHA-9 amphibious assault ship							
Procurement	0		650.0		0		
Advance procurement (AP)	0		0		0		
(Procurement quantity)	*(0)*		*(1)*		*(0)*		

Source: Table prepared by CRS based on Navy's FY2020 budget submission, committee and conference reports, and explanatory statements on FY2020 National Defense Authorization Act and FY2020 DOD Appropriations Act.

Notes: 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 agreement.

FY2020 National Defense Authorization Act (S. 1790)

Senate

The Senate Armed Services Committee, in its report (S.Rept. 116-48 of June 11, 2019) on S. 1790, recommended the funding levels shown in the SASC column of **Table 4**. Regarding these recommended funding levels, S.Rept. 116-48 states:

> **LPD-class amphibious transport ship**
>
> The budget request included no funding in line number 12 of Shipbuilding and Conversion, Navy (SCN), for procurement of LPD Flight II-class amphibious transport ships.
>
> The committee notes that the Navy has identified LPD-30, which was authorized and appropriated in fiscal year 2018, as the first Flight II LPD. In the fiscal year 2019 budget

[17] Government Accountability Office, Weapon Systems Annual Assessment, *Limited Use of Knowledge-Based Practices Continues to Undercut DOD's Investments*, GAO-19-336SP, May 2019, p. 133.

request, the Navy planned to procure the next Flight II LPD, LPD-31, in fiscal year 2020. The committee is concerned that the fiscal year 2020 budget request's delay of procurement of LPD-31 to fiscal year 2021 could result in production inefficiency, increased cost, and delay in reaching the Navy's requirement for 38 amphibious ships.

Therefore, the committee recommends an increase of $525.0 million in line number 12 of SCN for incremental funding of the amphibious transport ship designated LPD-31.

The committee's intent is for the Navy to use the $350.0 million appropriated in SCN line number 13 in fiscal year 2019 and additional fiscal year 2020 funds in SCN line number 12 to procure LPD-31 long-lead material and start construction as efficiently as possible. Consistent with the budget request, the committee expects the Navy to request the balance of costs for LPD-31 in fiscal year 2021.

LPD-class amphibious transport ship advance procurement

The budget request included $247.1 million in line number 13 of Shipbuilding and Conversion, Navy (SCN), for advance procurement of LPD Flight II-class amphibious transport ships.

The committee recommends transferring the funds requested in line number 13 of SCN to line number 12 of SCN to support incremental funding of the amphibious transport ship designated LPD-31.

Therefore, the committee recommends a decrease of $247.1 million in line number 13 of SCN for advance procurement of LPD Flight II-class amphibious transport ships.

LHA replacement amphibious assault ship

The budget request included no funding in line number 15 of Shipbuilding and Conversion, Navy (SCN), for procurement of LHA replacement amphibious assault ships.

The committee remains concerned with the Navy procurement profile for large deck amphibious assault ships, which includes a span of 7 years until the next large deck amphibious assault ship (LHA-9) would be procured in fiscal year 2024.

The committee notes that efficiencies could be gained by reducing this span, including steadier workflow with an increased learning curve, material and equipment suppliers with more predictable delivery contracts, and a more effective continuous improvement schedule.

The committee urges the Secretary of the Navy to accelerate procurement of LHA-9, including putting the $356.0 million appropriated in fiscal year 2019 for this ship on contract to procure long lead-time material as soon as possible and leveraging the incremental funding authority provided elsewhere in this Act to start construction and build LHA-9 as efficiently as possible.

Therefore, the committee recommends an increase of $650.0 million in line number 15 of SCN. (Pages 23-24)

Section 122 of S. 1790 as reported by the committee states:

SEC. 122. Capabilities based assessment for naval vessels that carry fixed-wing aircraft.

(a) In general.—Not later than 30 days after the date of the enactment of this Act, the Secretary of the Navy shall initiate a capabilities based assessment to begin the process of identifying requirements for the naval vessels that will carry fixed-wing aircraft following the ships designated CVN–81 and LHA–9.

(b) Elements.—The assessment shall—

(1) conform with the Joint Capabilities Integration and Development System, including Chairman of the Joint Chiefs of Staff Instruction 5123.01H; and

(2) consider options for the vessels described under subsection (a) that would enable greater commonality and interoperability of naval aircraft embarked on such naval vessels, including aircraft arresting gear and launch catapults.

(c) Notification requirement.—Not later than 15 days after initiating the assessment required under subsection (a), the Secretary of the Navy shall notify the congressional defense committees of such action and the associated schedule for completing the assessment and generating an Initial Capabilities Document.

Regarding Section 122, S.Rept. 116-48 states:

Capabilities based assessment for naval vessels that carry fixed-wing aircraft (sec. 122)

The committee recommends a provision that would require the Secretary of the Navy to conduct a capabilities-based assessment to clarify the future requirements for naval vessels that carry fixed-wing aircraft.

The committee notes that the budget request's proposal to retire the USS Harry S. Truman (CVN-75) early would yield a force with 10 or fewer aircraft carriers for more than 20 years. The budget request also includes a 7-year gap until the funding of the next amphibious assault ship, LHA-9, which will likely result in a production break. The committee is concerned that both the CVN-75 and LHA-9 proposals are contrary to current Navy force structure requirements and will result in significant negative impacts for the shipbuilding industrial base.

The committee also notes that the Under Secretary of the Navy stated in February 2019, "If $13 billion is unaffordable . . . what's the next carrier look like? Is it going to be as advanced as [the USS Gerald R. Ford] or is it going to be smaller? . . . We don't know the answers to that, but we're looking at those."

The committee also notes that all three future fleet platform architecture studies required by section 1067 of the National Defense Authorization Act for Fiscal Year 2016 (P.L. 114-92) recommended that the Navy pursue a class of aircraft carriers smaller than the Ford-class. The committee believes that smaller aircraft carriers could both increase aircraft carrier capacity and provide a more efficient means to conduct a range of missions with lower sortie requirements, including support for amphibious operations.

Accordingly, the committee directs the Secretary of the Navy to consult the fleet architecture studies, as well as the report on alternative aircraft carrier options required by section 128 of the National Defense Authorization Act for Fiscal Year 2016 (P.L. 114-92), and initiate a capabilities-based assessment to begin the process of identifying requirements for the naval vessels that will carry fixed-wing aircraft following CVN-81 and LHA-9. (Page 8)

Section 124 of S. 1790 as reported by the committee states:

SEC. 124. Design and construction of amphibious transport dock designated LPD–31.

(a) In general.—The Secretary of the Navy may enter into a contract for the design and construction of the amphibious transport dock designated LPD–31 using amounts authorized to be appropriated for the Department of Defense for Shipbuilding and Conversion, Navy.

(b) Use of incremental funding.—With respect to the contract entered into under subsection (a), the Secretary may use incremental funding to make payments under the contract with amounts authorized to be appropriated in fiscal years 2019, 2020, and 2021.

(c) Condition for out-year contract payments.—The contract entered into under subsection (a) shall provide that any obligation of the United States to make a payment under such contract for any fiscal year after fiscal year 2020 is subject to the availability of appropriations for that purpose for such fiscal year.

Regarding Section 124, S.Rept. 116-48 states:

Design and construction of amphibious transport dock designated LPD-31 (sec. 124)

The committee recommends a provision that would authorize the Secretary of the Navy to enter into and incrementally fund a contract for design and construction of the amphibious transport dock designated LPD-31.

The committee notes that in testimony before the Senate Armed Services Committee on April 7, 2019, the Secretary of the Navy and Chief of Naval Operations supported incremental funding authority for LPD-31. (Page 9)

Section 125 of S. 1790 as reported by the committee states:

SEC. 125. LHA Replacement Amphibious Assault Ship Program.

(a) Authority to use incremental funding.—The Secretary of the Navy may enter into and incrementally fund a contract for detail design and construction of the LHA replacement ship designated LHA 9 and, subject to subsection (b), funds for payments under the contract may be provided from amounts authorized to be appropriated for the Department of Defense for Shipbuilding and Conversion, Navy, for fiscal years 2019 through 2025.

(b) 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 any subsequent fiscal year is subject to the availability of appropriations for that purpose for such subsequent fiscal year.

(c) Repeal of obsolete authority.—Section 125 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364; 120 Stat. 2106) is repealed.

Regarding Section 125, S.Rept. 116-48 states:

LHA Replacement Amphibious Assault Ship Program (sec. 125)

The committee recommends a provision that would authorize the Secretary of the Navy to enter into and incrementally fund a contract for design and construction of the LHA replacement ship designated LHA-9.

The committee notes that in testimony before the Senate Armed Services Committee on April 7, 2019, the Secretary of the Navy and Chief of Naval Operations supported incremental funding authority for LHA-9.

The provision would also repeal section 125 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (P.L. 109-364). (Page 9)

S.Rept. 116-48 also states:

Acquisition strategy for LHA-9 and LHA-10

The committee notes that the Navy estimates that $4.0 billion will be saved using a block buy acquisition strategy for the procurement of CVN-80 and CVN-81.

The committee believes that such an approach for LHA-9 and LHA-10 could provide substantial cost savings as well as needed stability and predictability for the shipbuilder and its vendor base.

Accordingly, not later than October 1, 2019, the committee directs the Secretary of the Navy to submit a report to the congressional defense committees on the merits of pursuing a block buy acquisition strategy for LHA-9 and LHA-10.

> This report shall include a business case analysis comparing the cost and schedule of single ship contracts for LHA-9 and LHA-10 with a block buy contract for such ships as well as a description of other key considerations that the Secretary deems appropriate.
>
> If the business case analysis shows that pursuing a block buy strategy for LHA-9 and LHA-10 has merit, the committee strongly encourages the Secretary to consider inclusion of such a proposal in the Navy's budget request for fiscal year 2021.
>
> **Acquisition strategy for LPD Flight II-class ships**
>
> The committee notes that the Navy estimates that $4.0 billion will be saved using a block buy acquisition strategy for the procurement of CVN-80 and CVN-81.
>
> The committee believes that a block buy or multiyear procurement approach for LPD Flight II-class amphibious transport ships could provide substantial cost savings as well as needed stability and predictability for the shipbuilder and its vendor base.
>
> Accordingly, not later than October 1, 2019, the committee directs the Secretary of the Navy to submit a report to the congressional defense committees on the merits of pursuing a block buy or multiyear procurement acquisition strategy for LPD Flight II-class ships.
>
> This report shall include a business case analysis comparing the cost and schedule of single ship contracts with a block buy or multiyear contract for such ships as well as a description of other key considerations that the Secretary deems appropriate.
>
> If the business case analysis shows that pursuing a block buy or multiyear procurement strategy for LPD Flight II-class ships has merit, the committee strongly encourages the Secretary to consider inclusion of such a proposal in the Navy's budget request for fiscal year 2021. (Pages 33-34)

FY2020 DOD Appropriations Act (H.R. 2968)

House

The House Appropriations Committee, in its report (H.Rept. 116-84 of May 23, 2019) on H.R. 2968, recommended the funding levels shown in the HAC column of **Table 4**. The recommended reduction of $247.1 million in LPD-17 Flight II advance procurement funding (the entire requested amount) is for “Advance procurement [that was] funded in fiscal year 2019.” (Page 175)

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