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SUMMARY

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Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress

The aircraft carriers CVN-78, CVN-79, CVN-80, CVN-81, CVN-82, and CVN-83 are the first six ships in the Navy's new Gerald R. Ford (CVN-78) class of nuclear-powered aircraft carriers (CVNs). The Navy's proposed FY2026 budget requests $3,431.6 million (i.e., about $3.4 billion) in advance procurement (AP), procurement, and cost-to-complete (CTC) funding for Ford-class ships, as detailed below.

CVN-78 (*Gerald R. Ford*) was procured in FY2008. The ship was commissioned into service on July 22, 2017, and achieved initial operational capability in December 2021. The ship's first deployment began in October 2022, more than five years after the ship was commissioned into service.

CVN-79 (*John F. Kennedy*) was procured in FY2013. The Navy's FY2026 budget submission estimates its total procurement cost at $13,196.0 million (i.e., about $13.2 billion), states that the ship is scheduled for delivery in March 2027, and requests $150.0 million in CTC funding to cover cost growth on the ship.

CVN-80 (*Enterprise*) was procured in FY2018. The Navy's FY2026 budget submission estimates its total procurement cost at $14,247.5 million (i.e., about $14.2 billion), states that the ship is scheduled for delivery in July 2030, and requests $1,046.7 million (i.e., about $1.0 billion) in procurement funding for the ship.

CVN-81 (*Doris Miller*) is treated in this report as a ship that was procured in FY2019, consistent with congressional action on the Navy's FY2019 budget. (The Navy's FY2026 budget submission, like its FY2021-FY2025 submissions, shows CVN-81 as a ship that was procured in FY2020.) The Navy's FY2026 budget submission estimates its total procurement cost at $15,210.6 million (i.e., about $15.2 billion), states that the ship is scheduled for delivery in February 2032, and requests $1,622.9 million (i.e., about $1.6 billion) million in procurement funding for the ship. CVN-80 and CVN-81 were procured under a two-ship block buy contract.

CVN-82 (*William J. Clinton*) was projected under the Navy's FY2025 budget submission for procurement in FY2030 and delivery in 2040. Its estimated total procurement cost is not available. The Navy's FY2026 budget submission requests $612.0 million in AP funding for the ship.

CVN-83 (*George W. Bush*) was projected under the Navy's FY2025 budget submission for procurement in FY2034 and delivery in 2043. Its estimated total procurement cost is not available. The Navy's FY2026 budget submission requests no AP funding for the ship.

Oversight issues for Congress for the CVN-78 program include cost growth and schedule delays in building Ford-class ships, and whether to procure CVN-82 and CVN-83 as a two-ship buy similar to the two-ship buy that was used for procuring CVN-80 and CVN-81.

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Introduction

This report provides background information and potential oversight issues for Congress on the Gerald R. Ford (CVN-78) class nuclear-powered aircraft carrier (CVN) program. The Navy's proposed FY2026 budget requests $3,431.6 million (i.e., about $3.4 billion) in advance procurement (AP), procurement, and cost-to-complete (CTC) funding for Ford-class ships. Congress's decisions on the CVN-78 program could substantially affect Navy capabilities and funding requirements and the shipbuilding industrial base.

Background

Current Navy Aircraft Carrier Force

The Navy's current aircraft carrier force consists of 11 CVNs,[1] including 10 Nimitz-class ships (CVNs 68 through 77) that entered service between 1975 and 2009, and one Gerald R. Ford (CVN-78) class ship that was commissioned into service on July 22, 2017.[2]

Statutory Requirements for Carriers and Carrier Air Wings

Requirement to Maintain Not Less Than 11 Carriers

10 U.S.C. 8062(b) requires the Navy to maintain a force of not less than 11 operational aircraft carriers.[3] The requirement for the Navy to maintain not less than a certain number of operational aircraft carriers was established by Section 126 of the FY2006 National Defense Authorization Act (H.R. 1815/P.L. 109-163 of January 6, 2006), which set the number at 12 carriers. The requirement was changed from 12 carriers to 11 carriers by Section 1011(a) of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006).[4]

Prohibition on Retiring Nuclear-Powered Aircraft Carriers Prior to Refueling

Section 1054 of the FY2021 National Defense Authorization Act (NDAA) (H.R. 6395/P.L. 116-283) amended 10 U.S.C. 8062 to create a new subsection (which is now subsection [g]) stating: "A nuclear powered aircraft carrier may not be retired before its first refueling."

[1] The Navy's last remaining conventionally powered carrier (CV), *Kitty Hawk* (CV-63), was decommissioned on January 31, 2009.

[2] The commissioning into service of CVN-78 on July 22, 2017, ended a period during which the carrier force had declined to 10 ships—a period that began on December 1, 2012, with the inactivation of the one-of-a-kind nuclear-powered aircraft carrier *Enterprise* (CVN-65), a ship that entered service in 1961.

[3] 10 U.S.C. 8062 was previously numbered as 10 U.S.C. 5062. It was renumbered as 10 U.S.C. 8062 by Section 807 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (H.R. 5515/P.L. 115-232 of August 13, 2018), which directed a renumbering of sections and titles of Title 10 relating to the Navy and Marine Corps. (Sections 806 and 808 of P.L. 115-232 directed a similar renumbering of sections and titles relating to the Air Force and Army, respectively.)

[4] As mentioned in footnote 2, the carrier force dropped from 11 ships to 10 ships between December 1, 2012, when *Enterprise* (CVN-65) was inactivated, and July 22, 2017, when CVN-78 was commissioned into service. Anticipating the gap between the inactivation of CVN-65 and the commissioning of CVN-78, the Navy asked Congress for a temporary waiver of 10 U.S.C. 8062(b) to accommodate the period between the two events. Section 1023 of the FY2010 National Defense Authorization Act (H.R. 2647/P.L. 111-84 of October 28, 2009) authorized the waiver, permitting the Navy to have 10 operational carriers between the inactivation of CVN-65 and the commissioning of CVN-78.

Requirement to Maintain a Minimum of Carrier Air Wings

10 U.S.C. 8062(e), which was added by Section 1042 of the FY2017 National Defense Authorization Act (S. 2943/P.L. 114-328 of December 23, 2016) and amended by Section 121 of the FY2024 National Defense Authorization Act (H.R. 2670/P.L. 118-31 of December 22, 2023), requires the Navy to maintain a certain minimum number of carrier air wings.[5]

Navy's Aircraft Carrier Force-Level Goal

The Navy wants to achieve and maintain in coming years a fleet of 381 manned battle force ships, including 12 aircraft carriers. The Trump Administration has not explicitly endorsed the Navy's desired 381-ship force-level objective or any other ship force-level objective for the Navy as a whole.[6]

Projected Number of Aircraft Carriers

The Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan, which is designed to support the eventual attainment of a fleet of about 381 ships, projects that, if the plan were implemented, the Navy's carrier force would include a total of 12 carriers in only three years within the 30-year period, with the force including

- 11 carriers in FY2025-FY2036 (except for FY2025, FY2029, and FY2032, when it would include 12 carriers),
- 10 or 11 carriers in FY2037-FY2046, and
- 9 carriers in FY2047-FY2054 (except for FY2052, when it would include 10 carriers).

Incremental Funding Authority for Aircraft Carriers

Congress since the 1990s has authorized DOD to use incremental funding for procuring certain Navy ships, most notably aircraft carriers.[7] Under incremental funding, some of the funding

[5] 10 U.S.C. 8062(e) states

> (e) The Secretary of the Navy shall ensure that-
>
> (1) the Navy maintains a minimum of 9 carrier air wings until the earlier of-
>
> (A) the date on which additional operationally deployable aircraft carriers can fully support a 10th carrier air wing; or
>
> (B) October 1, 2025;
>
> (2) after the earlier of the two dates referred to in subparagraphs (A) and (B) of paragraph (1), the Navy maintains a minimum of 10 carrier air wings; and
>
> (3) for each such carrier air wing, the Navy maintains a dedicated and fully staffed headquarters.

[6] For additional discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

[7] The provisions providing authority for using incremental funding for procuring Ford-class carriers are as follows:

Section 121 of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006) granted the Navy the authority to use four-year incremental funding for CVNs 78, 79, and 80. Under this authority, the Navy could fully fund each of these ships over a four-year period that includes the ship's year of procurement and three subsequent years.

Section 124 of the FY2012 National Defense Authorization Act (H.R. 1540/P.L. 112-81 of December 31, 2011) amended Section 121 of P.L. 109-364 to grant the Navy the authority to use five-year incremental funding for CVNs (continued...)

needed to fully fund a ship is provided in one or more years after the year in which the ship is procured.[8] The use of incremental funding for procuring Ford-class aircraft carriers is reflected in the annual full funding (FF) figures shown in **Table 1**.

Aircraft Carrier Construction Industrial Base

All U.S. aircraft carriers procured since FY1958 have been built by Huntington Ingalls Industries/Newport News Shipbuilding (HII/NNS), of Newport News, VA. HII/NNS is the only U.S. shipyard that can build large-deck, nuclear-powered aircraft carriers. The aircraft carrier construction industrial base as of 2019 also included roughly 2,000 supplier firms in 46 states.[9]

Gerald R. Ford (CVN-78) Class Program

Overview

The Gerald R. Ford (CVN-78) class carrier design (**Figure 1** and **Figure 2**) is the successor to the *Nimitz*-class carrier design. The Ford-class design uses the basic *Nimitz*-class hull form but incorporates several improvements, including features permitting the ship to generate more aircraft sorties per day, more electrical power for supporting ship systems, and features permitting the ship to be operated by several hundred fewer sailors than a *Nimitz*-class ship, reducing estimated 50-year life-cycle operating and support (O&S) costs for each ship by about $4 billion compared to the *Nimitz*-class design. Navy plans call for procuring at least six Ford-class carriers—CVN-78, CVN-79, CVN-80, CVN-81, CVN-82, and CVN-83. The Navy's proposed FY2026 budget requests $3,431.6 million (i.e., about $3.4 billion) in advance procurement (AP), procurement, and cost-to-complete (CTC) funding for Ford-class ships, as detailed below.

CVN-78 (*Gerald R. Ford*)

CVN-78, which was named *Gerald R. Ford* in 2007,[10] was procured in FY2008. The ship's final procurement cost was $13,316.5 million (i.e., about $13.3 billion) in then-year dollars. The ship was commissioned into service on July 22, 2017, and achieved initial operational capability

78, 79, and 80. Since CVN-78 was fully funded in FY2008-FY2011, the provision in practice originally applied to CVNs 79 and 80, although as discussed in the footnote to **Table 1**, the Navy made use of the authority in connection with an FY2020 reprogramming action that reprogrammed $86.0 million of funding into FY2012 for CVN-78.

Section 121 of the FY2013 National Defense Authorization Act (H.R. 4310/P.L. 112-239 of January 2, 2013) amended Section 121 of P.L. 109-364 to grant the Navy the authority to use six-year incremental funding for CVNs 78, 79, and 80. Since CVN-78 was fully funded in FY2008-FY2011, the provision in practice applies to CVNs 79 and 80.

Section 121(c) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (H.R. 5515/P.L. 115-232 of August 13, 2018) authorized incremental funding to be used for making payments under the two-ship block buy contract for the construction of CVN-80 and CVN-81. This provision does not limit the total number of years across which incremental funding may be used to procure either ship.

[8] For more on full funding and incremental funding, see CRS Report RL31404, *Defense Procurement: Full Funding Policy—Background, Issues, and Options for Congress*, by Ronald O'Rourke and Stephen Daggett, and CRS Report RL32776, *Navy Ship Procurement: Alternative Funding Approaches—Background and Options for Congress*, by Ronald O'Rourke.

[9] Source: Jennifer Boykin, president of HII/NNS, as quoted in Marcus Weisgerber, "US Navy Places First 2-Carrier Order in Three Decades," *Defense One*, January 31, 2019.

[10] §1012 of the FY2007 defense authorization act (H.R. 5122/P.L. 109-364 of October 17, 2006) expressed the sense of Congress that CVN-78 should be named for President Gerald R. Ford. On January 16, 2007, the Navy announced that CVN-78 would be so named. CVN-78 and other carriers built to the same design are consequently referred to as Ford (CVN-78) class carriers. For more on Navy ship names, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

(IOC) in December 2021.[11] The ship's first deployment, which was delayed by a need to complete work on the ship's weapons elevators and correct other technical problems aboard the ship, began in October 2022, more than five years after the ship was commissioned into service.[12] The ship reportedly began its first full-length deployment on May 2, 2023.[13]

Figure 1. USS *Gerald R. Ford* (CVN-78)

Source: Cropped version of U.S. Navy photograph 240105-N-HJ055-1591, showing CVN-78 transiting the Strait of Gibraltar on January 5, 2024. Accessed April 15, 2024, at https://www.navy.mil/Resources/Photo-Gallery/igphoto/2003370046/.

CVN-79 (*John F. Kennedy*)

CVN-79, which was named *John F. Kennedy* on May 29, 2011,[14] was procured in FY2013. The Navy's FY2026 budget submission estimates its total procurement cost at $13,196.0 million (i.e., about $13.2 billion), states that the ship is scheduled for delivery in March 2027, and requests $150.0 million in CTC funding to cover cost growth on the ship.

[11] See, for example, Marcus Weisgerber, "Surprise! The Navy Declared Its Newest Carrier Battle-Ready Last Year," *Defense One*, April 5, 2022.

[12] See, for example, Nick Wilson, "First-in-Class Ford Aircraft Carrier Completes Inaugural Deployment," *Inside Defense*, November 29, 2022; Sam LaGrone, "Video: USS Gerald R. Ford Back in Norfolk After Two Months in the Atlantic," *USNI News*, November 26 (updated November 27), 2022; Diana Stancy Correll, "USS Gerald R Ford Slated to Wrap Up First Deployment," *Navy Times*, November 23, 2022.

[13] See, for example, Diana Stancy Correll, "USS Gerald R Ford Leaves Norfolk for First Full-Length Deployment," *Navy Times*, May 2, 2023; Aaron-Matthew Lariosa, "Aircraft Carrier USS Gerald R. Ford Departs Norfolk for Worldwide Deployment," USNI News, May 2, 2023.

[14] See "Navy Names Next Aircraft Carrier USS John F. Kennedy," *Navy News Service*, May 29, 2011, accessed online on June 1, 2011, at http://www.navy.mil/search/display.asp?story_id=60686. See also Peter Frost, "U.S. Navy's Next Aircraft Carrier Will Be Named After The Late John F. Kennedy," *Newport News Daily Press*, May 30, 2011. CVN-79 is the second ship to be named for President John F. Kennedy. The first, CV-67, was the last conventionally powered carrier procured for the Navy. CV-67 was procured in FY1963, entered service in 1968, and was decommissioned in 2007.

Figure 2. USS *Gerald R. Ford* (CVN-78)

Source: Cropped version of photograph accompanying Megan Eckstein, "Navy Removes Ford Carrier Program Manager, Citing Performance Over Time," *USNI News*, July 2, 2020. The caption credits the photograph to the U.S. Navy and states that it shows CVN-78 on June 4, 2020.

CVN-80 (*Enterprise*)

CVN-80, which was named *Enterprise* on December 1, 2012,[15] was procured in FY2018. The Navy's FY2026 budget submission estimates its total procurement cost at $14,247.5 million (i.e., about $14.2 billion), states that the ship is scheduled for delivery in July 2030, and requests $1,046.7 million (i.e., about $1.0 billion) in procurement funding for the ship.

[15] The Navy made the announcement of CVN-80's name on the same day that it deactivated the 51-year-old aircraft carrier CVN-65, also named *Enterprise*. ("Enterprise, Navy's First Nuclear-Powered Aircraft Carrier, Inactivated," *Navy News Service*, December 1, 2012; Hugh Lessig, "Navy Retires One Enterprise, Will Welcome Another," *Newport News Daily Press*, December 2, 2012.) CVN-65 was the eighth Navy ship named *Enterprise*; CVN-80 is to be the ninth.

CVN-81 (*Doris Miller*)

CVN-81, which was named *Doris Miller* on January 20, 2020,[16] is treated in this report as a ship that was procured in FY2019, consistent with congressional action on the Navy's FY2019 budget. (The Navy's FY2026 budget submission, like its FY2021-FY2025 submissions, shows CVN-81 as a ship that was procured in FY2020.) The Navy's FY2026 budget submission estimates its total procurement cost at $15,210.6 million (i.e., about $15.2 billion), states that the ship is scheduled for delivery in February 2032, and requests $1,622.9 million (i.e., about $1.6 billion) million in procurement funding for the ship. CVN-80 and CVN-81 were procured under a two-ship block buy contract.

CVN-82 (*William J. Clinton*)

CVN-82, which was named *William J. Clinton* on January 13, 2025,[17] was projected under the Navy's FY2025 budget submission for procurement in FY2030 and delivery in 2040. Its estimated total procurement cost is not available. The Navy's FY2026 budget submission requests $612.0 million in AP funding for the ship.

CVN-83 (*George W. Bush*)

CVN-83, which was named *George W. Bush* on January 13, 2025, as part of the same statement that named CVN-82,[18] is projected for procurement in FY2034 under the Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan.

Two-Ship Block Buy Contract for CVN-80 and CVN-81

CVN-80 and CVN-81 were procured under a two-ship block buy contract that was authorized by Section 121(a)(2) 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 permitted the Navy to add CVN-81 to the existing contract for building CVN-80 after DOD made certain certifications to Congress. DOD made the certifications on December 31, 2018, and the Navy announced the award of the contract on January 31, 2019. Prior to the awarding of the two-ship block buy contract, CVN-81 was scheduled to be procured in FY2023. The use of the two-ship block buy contract reduced the combined estimated procurement cost of the two ships.[19]

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[16] Doris Miller was an African American enlisted sailor who received the Navy Cross for his actions during the Japanese attack on Pearl Harbor on December 7, 1941. For further discussion of the naming of CVN-81 for Doris Miller, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

[17] White House, "Statement from President Biden Announcing the Names of CVN 82 and CVN 83," statement dated January 13, 2025. For further discussion of the naming of CVN-82, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

[18] White House, "Statement from President Biden Announcing the Names of CVN 82 and CVN 83," statement dated January 13, 2025. For further discussion of the naming of CVN-83, see CRS Report RS22478, *Navy Ship Names: Background for Congress*, by Ronald O'Rourke.

[19] Compared to the estimated procurement costs for CVN-80 and CVN-81 in the Navy's FY2019 budget submission, the Navy estimated under its FY2020 budget submission that the two-ship block buy contract will reduce the cost of CVN-80 by $246.6 million and the cost of CVN-81 by $2,637.3 million, for a combined reduction of $2,883.9 million (i.e., about $2.9 billion). (DOD characterized the combined reduction as "nearly $3 billion.") Using higher estimated baseline costs for CVN-80 and CVN-81 taken from a December 2017 Navy business case analysis, the Navy estimated under its FY2020 budget submission that the two-ship contract will reduce the cost of CVN-80 by about $900 million and the cost of CVN-81 by about $3.1 billion, for a combined reduction of about $4.0 billion. These figures are all expressed in then-year dollars, meaning dollars that are not adjusted for inflation. For additional background information on the two-ship block buy contract, see the **Appendix**.

Interest in Potential Two-Ship Block Buy Contract for CVN-82 and CVN-83 and "2-3-4" Approach for Procuring Aircraft Carriers

Some observers reportedly are interested in the option of using another two-ship block buy contract to procure CVN-82 and CVN-83.[20] More broadly, some observers have argued in favor of a "2-3-4" approach for procuring carriers that would include two-carrier buys, three years (rather than two years) of advanced procurement funding for each carrier, and four-year centers for building carriers (i.e., starting construction of each carrier four years after the start of the previous carrier's construction).[21]

Section 132 of the FY2023 NDAA (H.R. 7776/P.L. 117-263 of December 23, 2022) required the Navy to submit a report to the congressional defense committees not later than March 1, 2023, on advance procurement funding for CVN-82 and CVN-83 under single-carrier and two-carrier acquisition strategies.

Program Procurement Cost Cap

Congress established and subsequently amended procurement cost caps for Ford-class aircraft carriers.[22]

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[20] See, for example, Megan Eckstein, "US Navy Mulls Timing of New Double-Carrier Award Amid Enterprise Delay," *Defense News*, October 26, 2023; Loren Thompson, "The Right Way To Buy The U.S. Navy's New Generation Of Supercarriers," *Forbes*, September 30, 2022; Mike Gooding, "Block-Buy for New Aircraft Carriers Will Save Taxpayers Billions of Dollars," *13 News Now*, August 30 (updated August 31), 2022; Megan Eckstein, "Navy, HII Pitch Congress for Another Two-Carrier Contract," *Defense Ne*ws, August 29, 2022; Sam LaGrone, "HII Argues for Aircraft Carrier Block Buy as New Enterprise Takes Shape," *USNI News*, August 28, 2022; Justin Katz, "Ahead of Shipyard Ceremony, Navy and Industry Advocate for Another Aircraft Carrier 'Block Buy,'" *Breaking Defense*, August 26, 2022.

[21] Rich Abott, "HII Argues For Two Carrier Block Buys With Three Years Advance Work, Warns If CVN-82 Delayed," *Defense Daily*, January 8, 2024; Audrey Decker, "Delaying Aircraft Carrier Order Would Hurt Supply Chain, Shipbuilder Says," *Defense Daily*, January 8, 2024; Megan Eckstein, "HII Warns of Potential Carrier, Amphib Issues in Fy25 Budget Request," *Defense News*, January 8, 2024; Brett Davis, "Delay to CVN 82 Buy Could Endanger Industrial Base, New Industry Report Says," *Seapower*, January 17, 2024.

[22] The provisions that established and later amended the cost caps are as follows:

Section 122 of the FY2007 John Warner National Defense Authorization Act (H.R. 5122/P.L. 109-364 of October 17, 2006) established a procurement cost cap for CVN-78 of $10.5 billion, plus adjustments for inflation and other factors, and a procurement cost cap for subsequent Ford-class carriers of $8.1 billion each, plus adjustments for inflation and other factors. The conference report (H.Rept. 109-702 of September 29, 2006) on P.L. 109-364 discusses Section 122 on pages 551-552.

Section 121 of the FY2014 National Defense Authorization Act (H.R. 3304/P.L. 113-66 of December 26, 2013) amended the procurement cost cap for the CVN-78 program to provide a revised cap of $12,887.0 million for CVN-78 and a revised cap of $11,498.0 million for each follow-on ship in the program, plus adjustments for inflation and other factors (including an additional factor not included in original cost cap).

Section 122 of the FY2016 National Defense Authorization Act (S. 1356/P.L. 114-92 of November 25, 2015) further amended the cost cap for the CVN-78 program to provide a revised cap of $11,398.0 million for each follow-on ship in the program, plus adjustment for inflation and other factors, and with a new provision stating that, if during construction of CVN-79, the Chief of Naval Operations determines that measures required to complete the ship within the revised cost cap shall result in an unacceptable reduction to the ship's operational capability, the Secretary of the Navy may increase the CVN-79 cost cap by up to $100 million (i.e., to $11.498 billion). If such an action is taken, the Navy is to adhere to the notification requirements specified in the cost cap legislation.

Section 121(a) of the FY2018 National Defense Authorization Act (H.R. 2810/P.L. 115-91 of December 12, 2017) further amended the cost cap for the CVN-78 program to provide a revised cap of $12,568.0 million for CVN-80 and subsequent ships in the program, plus adjustment for inflation and other factors. (The cap for CVN-79 was kept at $11,398.0 million, plus adjustment for inflation and other factors.) The provision also amended the basis for adjusting (continued...)

Program Procurement Funding

Table 1 shows procurement funding for CVNs 78, 79, 80, 81, and 82 through FY2030, the final year of funding shown in the Navy's FY2026 budget submission. As shown in the table, the Navy's proposed FY2026 budget requests $150.0 million in CTC funding for CVN-79, $1,046.7 million in procurement funding for CVN-80, $1,622.9 million in procurement funding for CVN-81, and $612.0 million in AP funding for CVN-82.

Changes in Estimated Unit Procurement Costs Since FY2008 Budget

Table 2 shows changes in the estimated procurement costs of CVNs 78, 79, 80, and 81 since the budget submission for FY2008—the year of procurement for CVN-78.

the caps for inflation, and excluded certain costs from being counted against the caps.

Section 121 of the FY2020 National Defense Authorization Act (S. 1790/P.L. 116-92 of December 20, 2019) further amended the cost cap for the CVN-78 program to provide revised caps of $13,224.0 million for CVN-78, $11,398.0 million for CVN–79, $12,202.0 million for CVN–80, and $12,451.0 million for CVN–81. The provision directs the Navy to exclude from these figures costs for CVN–78 class battle spares, interim spares, and increases attributable to economic inflation after December 1, 2018.

Table 1. Procurement Funding for CVNs 78, 79, 80, 81, and 82 Through FY2030

(Millions of then-year dollars, rounded to nearest tenth)

FY	CVN-78	CVN-79	CVN-80	CVN-81	CVN-82	Total
FY01	21.7 (AP)	0	0	0	0	21.7
FY02	135.3 (AP)	0	0	0	0	135.3
FY03	395.5 (AP)	0	0	0	0	395.5
FY04	1,162.9 (AP)	0	0	0	0	1,162.9
FY05	623.1 (AP)	0	0	0	0	623.1
FY06	618.9 (AP)	0	0	0	0	618.9
FY07	735.8 (AP)	52.8 (AP)	0	0	0	788.6
FY08	2,685.0 (FF)	123.5 (AP)	0	0	0	2,808.5
FY09	2,687.0 (FF)	1,210.6 (AP)	0	0	0	3,897.6
FY10	851.3 (FF)	482.9 (AP)	0	0	0	1,334.2
FY11	1,848.1 (FF)	902.5 (AP)	0	0	0	2,750.6
FY12	86.0 (FF)[a]	554.8 (AP)	0	0	0	640.8
FY13	0	491.0 (FF)	0	0	0	491.0
FY14	588.1 (CC)	917.6 (FF)	0	0	0	1,505.7
FY15	663.0 (CC)	1,219.4 (FF)	0	0	0	1,882.4
FY16	123.8 (CC)	1,569.5 (FF)	862.4 (AP)	0	0	2,555.7
FY17	0	1,241.8 (FF)	1,370.8 (AP)	0	0	2,612.6
FY18	20.0 (CC)	2,556.4 (FF)	1,569.6 (FF)	0	0	4,146.0
FY19	0	0	929.1 (FF)	643.0 (FF)	0	1,572.1
FY20	0	0	1,062.0 (FF)	1,214.5 (FF)	0	2,276.5
FY21	71.0 (CC)	0	958.9 (FF)	1,606.4 (FF)	0	2,636.3
FY22	0	291.0 (CC)	1,062.2 (FF)	1,287.7 (FF)	0	2,640.9
FY23	0	461.7 (CC)	1,465.9 (FF)	1,052.0 (FF)	0	2,979.6
FY24	0	624.6 (CC)	1,104.4 (FF)	800.5 (FF)	0	2,529.5
FY25	0	236.0 (CC)	1,123.1 (FF)	674.9 (FF)	0	2,034.0
FY26 (requested)	***0***	***150.0 (CC)***	***1,046.7 (FF)***	***1,622.9 (FF)***	***612.0 (AP)***	***3,431.6***
FY27 (programmed)	*0*	*110.0 (CC)*	*1,230.3 (FF)*	*2,352.3 (FF)*	*n/a*	*n/a*
FY28 (programmed)	*0*	*0*	*231.0 (FF)*	*2,742.3 (FF)*	*n/a*	*n/a*
FY29 (programmed)	*0*	*0*	*200.0 (FF)*	*31.0 (FF)*	*n/a*	*n/a*
FY30 (programmed)	*0*	*0*	*31.0 (FF)*	*1,183.0 (FF)*	*n/a*	*n/a*
Total	**13,316.5**	**13,196.0**	**14,247.5**	**15,210.6**	**n/a**	**n/a**

Source: Table prepared by CRS based on Navy's FY2026 budget submission and prior-year submissions.

Notes: Figures may not add due to rounding. **n/a** is not available. **AP** is advance procurement funding; **FF** is full funding; **CC** is cost-to-complete (CTC) funding (i.e., funding to cover cost growth).

a. Even though FY2012 is after FY2011 (CVN-78's original final year of full funding), the Navy characterizes the $86.0 million reprogrammed into FY2012 as full funding rather than CTC funding on the grounds that in the years since FY2011, the authority to use incremental funding for procuring aircraft carriers has been expanded by Congress to permit more than the four years of incremental funding that were permitted at the time that CVN-78 was initially funded.

Table 2. Changes in Estimated Procurement Costs of CVNs 78, 79, 80, and 81

(As shown in FY2008-FY2024 budgets, in millions of then-year dollars)

	CVN-78		CVN-79		CVN-80		CVN-81	
Budget	Est. proc. cost	*Scheduled/* actual FY of proc.	Est. proc. cost	*Scheduled/* actual FY of proc.	Est. proc. cost	*Scheduled/* actual FY of proc.	Est. proc. cost	*Scheduled/* actual FY of proc.
FY08	10,488.9	FY08	9,192.0	*FY12*	10,716.8	*FY16*	n/a	*FY21*
FY09	10,457.9	FY08	9,191.6	*FY12*	10,716.8	*FY16*	n/a	*FY21*
FY10	10,845.8	FY08	n/a	*FY13*	n/a	*FY18*	n/a	*FY23*
FY11	11,531.0	FY08	10,413.1	*FY13*	13,577.0	*FY18*	n/a	*FY23*
FY12	11,531.0	FY08	10,253.0	*FY13*	13,494.9	*FY18*	n/a	*FY23*
FY13	12,323.2	FY08	11,411.0	FY13	13,874.2	*FY18*	n/a	*FY23*
FY14	12,829.3	FY08	11,338.4	FY13	13,874.2	*FY18*	n/a	*FY23*
FY15	12,887.2	FY08	11,498.0	FY13	13,874.2	*FY18*	n/a	*FY23*
FY16	12,887.0	FY08	11,347.6	FY13	13,472.0	*FY18*	n/a	*FY23*
FY17	12,887.0	FY08	11,398.0	FY13	12,900.0	*FY18*	n/a	*FY23*
FY18	12,907.0	FY08	11,377.4	FY13	12,997.6	FY18	n/a	*FY23*
FY19	12,964.0	FY08	11,341.4	FY13	12,601.7	FY18	15,088.0	FY19
FY20	13,084.0	FY08	11,327.4	FY13	12,335.1	FY18	12,450.7	FY19
FY21	13,316.5	FY08	11,397.7	FY13	12,321.3	FY18	12,450.7	FY19
FY22	13,316.5	FY08	11,929.7	FY13	12,405.5	FY18	12,483.6	FY19
FY23	13,316.5	FY08	12,700.0	FY13	12,832.9	FY18	12,930.0	FY19
FY24	13,316.5	FY08	12,700.0	FY13	12,812.9	FY18	12,929.1	FY19
FY25	13,316.5	FY08	12,936.0	FY13	13,719.9	FY18	14,015.6	FY19
FY26	13,316.5	FY08	13,196.0	FY13	14,247.5	FY18	15,210.6	FY19
Annual % change								
FY08 to FY09	-0.3		0%		0%		n/a	
FY09 to FY10	+3.7		n/a		n/a		n/a	
FY10 to FY11	+6.3		n/a		n/a		n/a	
FY09 to FY11					+26.7%			
FY11 to FY12	0%		-1.5%		-0.1%		n/a	
FY12 to FY13	+6.9%		+11.3%		+2.8%		n/a	
FY13 to FY14	+4.1%		-0.6%		0%		n/a	
FY14 to FY15	+0.5%		+1.4%		0%		n/a	
FY15 to FY16	0%		-1.3%		-2.9%		n/a	
FY16 to FY17	0%		+0.4%		-4.2%		n/a	
FY17 to FY18	+0.2%		-0.2%		+0.7%		n/a	
FY18 to FY19	+0.4%		-0.3%		-3.0%		n/a	
FY19 to FY20	+0.9%		-0.1%		-2.1%		-17.5%	
FY20 to FY21	+1.8%		+0.6%		-0.1%		0%	
FY21 to FY22	0%		+4.7%		+0.7%		+0.3%	
FY22 to FY23	0%		+6.5%		+3.4%		+3.6%	
FY23 to FY24	0%		0%		-0.2%		-0.007%	
FY24 to FY25	0%		+1.9%		+7.1%		+8.4%	
FY25 to FY26	0%		+2.0%		+3.8%		+8.5%	
Cumulative % change through FY24 from actual procurement dates of FY08, FY13, FY18, and FY19								
Since FY08	+27.0%		+40.7%		+28.0%		n/a	
Since FY13			+13.4%					
Since FY18					+9.6%			
Since FY19							-0.8%	

Source: Table prepared by CRS based on Navy's FY2025 budget submission and prior-year submissions.

Notes: n/a means not available. The FY2010 budget submission did not show estimated procurement costs or scheduled years of procurement for CVNs 79 and 80. The scheduled years of procurement for CVNs 79 and 80 shown here for the FY2010 budget submission are inferred from the shift to five-year intervals for procuring carriers that was announced by Secretary of Defense Gates in his April 6, 2009, news conference regarding recommendations for the FY2010 defense budget.

Issues for Congress

Cost Growth and Schedule Delays

One oversight issue for Congress concerns cost growth and schedule delays in building Ford-class ships. Cost growth in building Ford-class ships is shown in **Table 2**.

As discussed in another CRS report,[23] schedule delays have been experienced in multiple Navy shipbuilding programs, including the Ford-class program, due in large part to workforce challenges at shipyards (i.e., challenges in recruiting and retaining sufficient numbers of workers) and supply chain challenges (including bottlenecks and lengthening delivery times for materials and components).

In the Navy's budget submission for FY2013—the year that CVN-79 was procured—the ship's estimated delivery date was September 2022. The Navy's FY2026 budget submission shows a delivery date of March 2027, a delay of 54 months, or four and one-half years.

In the Navy's budget submission for FY2018—the year that CVN-80 was procured—the ship's estimated delivery date was September 2027. The Navy's FY2026 budget submission shows a delivery date of July 2030, a delay of 34 months, or close to three years.

In the Navy's budget submission for FY2020—the first budget submission to reflect the inclusion of CVN-81 in the two-ship block buy that also includes CVN-80—CVN-81's estimated delivery date was February 2032. The Navy's FY2026 budget submission shows the same date.

A July 7, 2025, press report states

> The next Ford-class aircraft carrier is facing a two-year delay that will leave the Navy with ten carriers for about a year, USNI News has learned.
>
> The future USS John F. Kennedy (CVN-79) will now deliver in March 2027, according to the Navy's Fiscal Year 2026 budget justification documents. The carrier was supposed to deliver this month, according to last year's budget plans.
>
> "The CVN 79 delivery date shifted from July 2025 to March 2027 (preliminary acceptance TBD) to support completion of Advanced Arresting Gear (AAG) certification and continued Advanced Weapons Elevator (AWE) work," reads the latest FY 2026 shipbuilding budget book.
>
> Those two technologies – the system used to catch aircraft landing on the carrier's deck and the weapons elevators that move ordnance through the ship – are new systems incorporated into the Ford class. A spokesperson for General Atomics, which makes the AAG, did not immediately respond to a request for comment.
>
> "The Navy is exploring opportunities for preliminary acceptance of the vessel prior to formal delivery and is coordinating closely with stakeholders to ensure the fastest possible

[23] CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

> transition to fleet operations and a combat-capable carrier," a Navy spokesperson told USNI News in a statement.
>
> A spokesperson for HII's Newport News Shipbuilding, which builds the carriers, said the company is applying lessons from building the lead ship to the successive ships in the class.
>
> "Specifically, John F. Kennedy (CVN 79) construction was fairly advanced when many Ford lessons were realized, precluding timely implementation of lessons learned for Kennedy," company spokesperson Todd Corillo said in a statement. "In contrast, Enterprise (CVN 80) and Doris Miller (CVN 81) have been able to incorporate, leverage and capitalize on Ford lessons learned earlier in the construction process."…
>
> USS Nimitz (CVN-68), the oldest aircraft carrier in service at 50 years, is scheduled to retire in May 2026, meaning the Navy's inventory will dip from 11 to 10 carriers for nearly a year before JFK delivers….
>
> The latest budget books show that the future USS Enterprise (CVN-80) is also facing a nearly one-year delay. The carrier is now slated to deliver in July of 2030 instead of last year's projection of September 2029.
>
> "The CVN 80 delivery date shifted from September 2029 to July 2030 due to delays in material availability and industry/supply chain performance," reads the budget books.
>
> Last year's budget documents forecast an 18-month delay for Enterprise, pushing the delivery from March of 2028 to September of 2029, USNI News reported at the time.
>
> "CVN 80's schedule continues to be challenged by late delivery of sequence critical material," the Navy spokesperson said about Enterprise. "Delays of 18-26 months as assessed as part of the 2024 45-Day Shipbuilding Review have eroded to 28 months with risk for overall ship construction. The Navy is working closely with the shipbuilder to improve those projections."[24]

Two-Ship Buy for CVN-82 and CVN-83

Another issue for Congress is whether to procure CVN-82 and CVN-83 as a two-ship buy similar to the two-ship buy that was used for procuring CVN-80 and CVN-81. This could reduce the combined procurement cost for CVN-82 and CVN-83, and increase near-term procurement funding requirements for the two ships.

Opponents of procuring CVN-82 and CVN-83 as a two-ship buy could argue that it could be premature to commit to the procurement of CVN-83, given ongoing changes in military technologies and concepts of operation, and that the additional near-term procurement funding requirements of a two-ship buy could crowd out funding available for other Navy program priorities.

Supporters of procuring CVN-82 and CVN-83 as a two-ship buy could argue that Ford-class carriers will continue to be needed, notwithstanding changes in military technologies and concepts of operation, help support the aircraft carrier industrial base by providing a known quantity of carrier-construction work for years to come, and substantially reduce the combined

[24] Mallory Shelbourne, "Carrier John F. Kennedy Delivery Delayed 2 Years, Fleet Will Drop to 10 Carriers For 1 Year," *USNI News*, July 7, 2025. See also Anthony Capaccio, "Newest US Navy Aircraft Carrier Faces 20-Month Delivery Delay," *Bloomberg*, July 7, 2025; Hope Hodge Seck, "First Columbia-class Sub, Two Aircraft Carriers Face Delivery Delays, Navy Officials Tell Senate," *USNI News*, April 9 (updated April 10), 2025; Abby Shepherd, "CVN-79 Delivery Pushed Back, Navy Official Tells Lawmakers," *Inside Defense*, April 9, 2025; Anthony Capaccio, "Carrier's Delivery Date Likely to Be Missed, US Navy Says," *Bloomberg*, April 8, 2025.

procurement cost of the two ships, releasing Navy funding for use in meeting other program priorities.

A June 5, 2025, press report states

> A block buy of the fifth and sixth Gerald R. Ford-class aircraft carriers (Opens in a new window)stands to save the US Navy approximately $5 billion compared to purchasing the ships individually, the service's acting acquisition executive told lawmakers on Wednesday [June 4].
>
> Brett Seidle discussed the expected savings while testifying about the Navy's budget request alongside the Navy and Marine Corps' top requirements officers, Vice Adm. James Pitts and Lt. Gen. Eric Austin.[25]

Faulty Welds

Another oversight issue for Congress concerns faulty welds on certain new Navy ships, including Ford-class carriers, that were first reported in late September 2024. An October 3, 2024, letter from the House Armed Services Committee to the Secretary of the Navy states in part

> It is deeply concerning to learn that faulty welds may have been knowingly made to U.S. Navy submarines and aircraft carriers. The safety of our sailors is our top concern, and we must immediately understand any risks associated with the faulty work. The Department of Defense needs to immediately provide our committee with answers and a plan for how both you and Huntington Ingalls Industries-Newport News (HII-NNS) will protect U.S. Navy vessels against knowingly faulty work. Absolute transparency with Congress is essential. These vessels are critical to U.S. defense – we must ensure that these vessels are protected against any bad actors seeking to put U.S. national security or our service members at risk.
>
> While we are aware that the U.S. Department of Justice is investigating, we want to understand the scope of the problem. Therefore, we expect a briefing to be scheduled promptly on this matter and answers to the below questions no later than October 11, 2024.
>
> 1. Does the Navy fully understand the extent of all knowingly faulty welds made by workers at HII-NNS on in-service vessels and vessels under construction?
>
> 2. Provide an assessment of any knowingly faulty welds made by workers at HII-NNS that pose a threat to sailor safety made on currently in-service vessels.
>
> 3. Provide all known impacts to in-service and under construction vessels impacted by knowingly faulty welds made by workers at HII-NNS.
>
> 4. Provide a recovery plan for in-service and under construction vessels impacted by knowingly faulty welds made by workers at HII-NNS.
>
> 5. Provide rework plans for in-service and under construction vessels impacted by knowingly faulty welds made by workers at HII-NNS.
>
> 6. Provide a detailed timeline of when the Navy knew about knowingly faulty welds made by HII-NNS.[26]

[25] Justin Katz, "Block Buy of Fifth, Sixth Ford-Class Carriers Could Yield $5B in Savings: Senior Navy Official," *Breaking Defense*, June 5, 2025.

[26] Letter dated October 3, 2024, from Representative Mike Rogers, Representative Adam Smith, Representative Trent Kelly, and Representative Joe Courtney, to the Honorable Carlos Del Toro, Secretary of the Navy. See also Nick Wilson, "Navy Nearly Done Reviewing Suspected Faulty Welds," *Inside Defense*, November 14, 2024; Sam LaGrone, "HII: Fewer than 2 Dozen Shipyard Workers Involved in Suspect Welds, Delay in 17-Sub Contract Creates (continued...)

Future Aircraft Carrier Force Level

Another issue for Congress concerns the future aircraft carrier force level. Decisions on this issue could have implications for the service lives of existing aircraft carriers and/or plans for procuring new aircraft carriers. The future aircraft carrier force level has been a frequent matter of discussion over the years, and (correctly or not) is often the starting point or the center of broader discussions over the future size and composition of the Navy. Factors involved in discussions about the future aircraft carrier force level include but are not limited to the following:

- the capabilities and costs (including procurement costs and life-cycle operation and support [O&S] costs) of aircraft carriers and their embarked air wings, and how those capabilities and costs compare to those of other U.S. military forces;
- the prospective survivability of aircraft carriers in conflicts against adversaries (such as China) with highly capable anti-ship missiles;
- the numbers of carriers needed to support policymaker-desired levels of day-to-day aircraft carrier forward presence in various regions around the world; and
- the utility of carriers for purposes other than high-end combat, including deterrence of potential regional adversaries, reassurance of allies and partners, signaling U.S. commitment and resolve, and noncombat operations such as humanitarian assistance/disaster response (HA/DR) operations.

As noted earlier

- 10 U.S.C. 8062(b) requires the Navy to maintain a force of not less than 11 operational aircraft carriers.
- The Navy wants to achieve and maintain in coming years a fleet of 381 manned battle force ships, including 12 aircraft carriers. The Trump Administration has not explicitly endorsed the Navy's desired 381-ship force-level objective or any other ship force-level objective for the Navy as a whole.
- The Navy's FY2025 30-year (FY2025-FY2054) shipbuilding plan, which is designed to support the eventual attainment of a fleet of about 381 ships, projects

'Unpredictability,'" *USNI News*, October 31, 2024; Caitlyn Burchett, "Navy Launches Investigation into Faulty Welds on 26 Warships at Virginia Shipyard," *Stars and Stripes*, October 10, 2024; Konstantin Toropin, "Navy Says 26 Ships Affected by Faulty Welds at Newport News Shipyard in Virginia," *Military.com*, October 7, 2024; Maritime Executive, "At Least One Carrier and Two Subs Affected by Newport News Weld Defects," *Maritime Executive*, October 6, 2024; Valerie Insinna, "HASC Leaders Probe Navy on Newport News Faulty Welding Problem," *Breaking Defense*, October 4, 2024; Leo Shane III and Geoff Ziezulewicz, "Navy Identifies Three Vessels Impacted by Faulty Shipyard Weld Work," *Military Times*, October 4, 2024; Sam LaGrone, "HASC Wants Navy Info on Suspected Faulty Welds, Says Letter to SECNAV," *USNI News*, October 3, 2024; Rich Abott, "HII Admits To Faulty Welds On Carriers And Subs, House Committee Investigating," *Defense Daily*, September 30, 2024; Maritime Executive, "Workers at Newport News Made Faulty Welds on U.S. Navy Carriers and Subs," *Maritime Executive*, September 30, 2024; Mike Glenn, "Lawmakers Press Navy over Faulty Welding Reports on Submarines, Aircraft Carriers Under Construction," *Washington Times*, September 27, 2024; Jane Harper, "Faulty Welding Found on Submarines, Aircraft Carriers at Newport News Shipyard; May Be Intentional," *Virginian-Pilot*, September 27, 2024; Rebecca Kheel, "Lawmakers Launch Investigation of Reported Faulty Welds on Navy Subs and Aircraft Carriers," *Military.com*, September 27, 2024; Sam LaGrone, "Lawmakers to Investigate Faulty Sub, Carrier Welding at Newport News Shipbuilding," *USNI News*, September 27, 2024; Wyatt Olson, "Report Says East Coast Shipbuilder Discovered Faulty Welds on Subs, Aircraft Carriers," *Stars and Stripes*, September 27, 2024; Christina Shaw, "Newport News Shipbuilding Suspects Intentionally Faulty Welds on Multimillion-Dollar Naval Vessels," *Fox News*, September 27, 2024; Geoff Ziezulewicz, "Lawmakers Demand Answers over Reports of Faulty Navy Ship Welding," *Defense News*, September 27, 2024; Sam LaGrone, "DoJ Notified of Suspected Faulty Welds on Subs, Aircraft Carriers at Newport News Shipbuilding," *USNI News*, September 26, 2024.

that, if the plan were implemented, the Navy's carrier force would include fewer than 12 carriers in all but three years within the 30-year period.

Issues Raised in DOT&E and GAO Reports

Another oversight issue for Congress concerns CVN-78 program issues raised in the 2025 edition of the Government Accountability Office's (GAO's) annual report surveying selected DOD weapon acquisition programs, and in a January 2025 report from DOD's Director, Operational Test and Evaluation (DOT&E)—DOT&E's annual report for FY2024.

June 2025 GAO Report

A June 2025 GAO report—the 2025 edition of GAO's annual report assessing selected major weapon acquisition programs—stated the following about the CVN-78 program:

> **Current Status**
>
> The program's unit costs increased by 3 percent, or about $480 million, since last year. Changes to CVN 79's delivery schedule that we previously reported account for about half of this increase but the Navy is using funds it previously planned and budgeted for post-delivery activities, so these are not new program costs. CVN 80 delays and cost increases for CVNs 81, 82, and 83, among other costs, account for the rest, according to program officials.
>
> Construction challenges affected CVN 79 and CVN 80 delivery schedules. Continuing delays to Advanced Weapons Elevators construction put CVN 79's July 2025 delivery at risk, according to program officials. They said that, while this construction improved since CVN 78, they may postpone noncritical work like painting until after delivery to avoid delay. Further, the Navy now plans for CVN 80 delivery in May 2030, a 26-month delay since last year. Program officials attributed this delay to construction material availability and persistent shipyard workforce issues that the program is working to mitigate with revised schedules and worker incentives. The program reported it has not assessed the carrier industrial base for potential manufacturing risks but officials said that they plan to leverage other industrial base initiatives. This includes those related to submarines and within the Navy's new Maritime Industrial Base program office.
>
> The program is assessing how to complete initial operational test and evaluation. The Navy began CVN 78's operational testing in August 2022 but had to deploy CVN 78 earlier, extending the test period to March 2025. Testing may not be complete until fiscal year 2027 due to coordination of test events with CVN 78's next deployment. Program officials said they may move events into the ship's follow-on operational test phase. Moving test events would help the program report initial test results sooner but would delay the Navy's ability to determine whether the program meets all key performance goals.
>
> **Program Office Comments**
>
> We provided a draft of this assessment to the program office for comment and incorporated its technical comments where appropriate. The program stated that CVN 78 was recognized as the best all-around ship in the Atlantic Fleet in 2024. It also stated that, since inaugural deployment, CVN 78 completed a maintenance period and is conducting training and other readiness activities for future operations. The program stated that it also completed CVN 78's final live fire test and evaluation event in January 2025.[27]

[27] Government Accountability Office, *Weapon Systems Annual Assessment[:] DOD Leaders Should Ensure That Newer Programs Are Structured for Speed and Innovation*, GAO-24-107569, June 2025, p. 121.

January 2025 DOT&E Report

Regarding the CVN-78 program, the January 2025 DOT&E report stated the following in part:

> **TEST ADEQUACY**
>
> The Navy began Ford-class IOT&E in September 2022 and is conducting it in accordance with TEMP Revision E and the DOT&E-approved portions of the IOT&E test plan Update 1. However, the RMLA data collection gaps identified in the FY23 Annual Report remain. If not rectified, these gaps could result in insufficient data to inform conclusive assessments of RMLA for some key subsystems. In addition to affecting suitability assessments, these data gaps could also affect effectiveness assessments, due to the on-demand nature of many key subsystems and the reliance upon accurate RMLA data in both the self-defense and SGR models.
>
> In FY24, the Navy improved data collection for EMALS reliability and is actively working to improve data collection for AAG reliability. The Navy has not yet shown progress for data collection on the other shipboard systems, but has implemented procedural changes designed to improve data collection within shipboard work centers in support of the FY25 scheduled test events. The Navy will continue to update the IOT&E test plan for the major remaining tests such as SGR, self-defense, and cyber survivability tests.
>
> In March 2024, the Navy conducted pierside shipboard cyber survivability tests to assess Ford-class overall cyber survivability and enable post hoc accreditation of the test facilities used in completed land-based cyber survivability testing of EMALS and AAG. This included some testing of the ship's industrial control systems.
>
> Between February and March 2024, the Navy's Operational Test and Evaluation Force (OPTEVFOR) conducted cyber survivability testing aboard CVN 78, in accordance with a DOT&E-approved test plan and with DOT&E observation. The test occurred with CVN 78 pierside and was informed by the land-based test site evaluation detailed in the FY23 Annual Report. The CVN 78 cyber survivability test supported evaluations of the CVN 78 variations of the following programs of record: the SSDS integrated combat system, CEC, and SEWIP. OPTEVFOR will use final analysis of the pierside cyber test of CVN 78 in the planning of the remaining cyber survivability testing with CVN 78 underway; the Navy expects to complete this remaining cyber survivability testing in FY25.
>
> In FY24, the Navy published two vulnerability assessment reports examining the Ford-class survivability against above-water and underwater kinetic threats. These reports were based on survivability testing and ship modeling. However, the Navy's ship models require updating to incorporate changes to the as-built Ford-class from original design, so their use for survivability assessment is limited. The Navy intends to issue a final survivability assessment report that will include the findings from testing conducted since 2020 and update model-based survivability analysis by 4QFY25. The updated ship models are necessary to support DOT&E's report on the survivability of the Ford-class against threat weapons. DOT&E has requested the Navy provide a roadmap for Ford-class ship model updates that will support representative survivability assessments.
>
> Evaluation of the Ford-class's anti-air warfare capability is coordinated between the CVN 78 TEMP Revision E and the Capstone Enterprise Air Warfare Ship Self-Defense (AW SSD) TEMP 1714 of March 2008. The evaluation includes a series of live missile fire events aboard CVN 78 against a variety of anti-ship cruise missile (ASCM) threat surrogates. In April 2024, DOT&E approved a modified test strategy for these missile fire events that incorporates refined fleet-representative defensive employment tactics against threat ASCMs. Unplanned post-deployment maintenance requirements for various ship systems will delay these tests until early FY25. These tests will demonstrate Ford-class ship self-defense capability and are required to validate modeling and simulation (M&S) used to predict CVN 78 performance across the spectrum of threat ASCMs.

The Ford-class SGR evaluation is composed of M&S (for both Ford- and Nimitz-class), a four-day sustained test on CVN 78, a one-day surge test on CVN 78, and observation of flight operations on a Nimitz-class carrier. Development of the M&S suite intended to evaluate the SGR, the Sea Strike/Sea Basing Aviation Model (SSAM), is ongoing. The Ford-class sustained SGR test is scheduled to occur in late FY25. The Navy plans to apply lessons from the sustained SGR test to the surge SGR test, which is currently unscheduled. DOT&E approved these deferments in Revision 1 to the IOT&E test plan, and the Navy needs to provide an updated test plan for DOT&E approval, prior to conducting these events.

In FY24, the Navy collected flight operations data during the USS Harry S. Truman (CVN 75) COMPTUEX to support a Nimitz-class SGR M&S suite (part of SSAM) for comparative analysis. The Navy and DOT&E are dependent on SSAM for SGR key performance parameter (KPP) evaluation. However, limited test data places the validation of SSAM at risk, and the two SGR demonstrations are the only planned opportunities to collect high-tempo validation data in a requirement-representative scenario. The Navy can mitigate this risk by adequately resourcing the two SGR demonstrations, maximizing data collection during these events, and characterizing model performance to focus on the most critical live data needs.

The Navy remains in development of an enterprise test strategy that will coordinate ship self-defense evaluation of multiple ship classes, including the Ford-class, as modified in CVN 79 and follow-on carriers. The new enterprise test strategy for the CVN 79 and follow-on ships will be coordinated between the CVN 78 TEMP Revision F and the yet-to-be-approved Enterprise TEMP 1910. CVN 79 includes an updated combat system, SSDS Baseline 12, and the new SPY-6(V)3 radar system. The details of this enterprise approach are in the SSDS article of this Annual Report. The Navy has yet to finalize the replacement self-defense test capability for ship self-defense against threat ASCMs following the deactivation of the current self-defense test ship, ex-USS Paul F. Foster, expected in FY30. To avoid delays in determining Ford-class capability and survivability, the Navy should finalize enduring test capabilities, similar to those provided by ex-USS Paul F. Foster, in FY25.

PERFORMANCE

EFFECTIVENESS

Insufficient data are available to determine the Ford-class's operational effectiveness due to IOT&E being incomplete. Observations based on testing to date are below.

Combat System

Self-defense testing against unmanned aerial vehicles and high-speed maneuvering surface targets (small boats) was conducted in July 2022. Details can be found in DOT&E's classified early fielding report (EFR) dated April 2023. The Navy is developing fixes to combat system deficiencies identified in DOT&E's classified interim assessment report dated April 2022. However, the fixes remain largely unfunded to date.

SGR

During USS Gerald R. Ford's FY24 deployment, the ship and its embarked air wing maintained sortie generation rates that were sufficient to meet combatant commander operational taskings. Although the sortie generation rates sustained during particular evolutions, such as Carrier Qualification, have numerically approached those required by the KPP, the aircraft configuration and tempo of these operations did not match the Design Reference Mission and were therefore not representative of the KPP requirement. The reliability and maintainability of CVN 78's EMALS and AAG continue to adversely affect sortie generation and flight operations, which remains the greatest risk to demonstrating operational effectiveness and suitability in IOT&E.

Electromagnetic Spectrum Compatibility

Developmental testing identified significant electromagnetic radiation hazard and interference problems. The Navy implemented some mitigation measures and conducted follow-on characterization testing during independent steaming events in developmental test, but improvements have not been assessed in operational testing. The Navy should verify electromagnetic spectrum compatibility during operational test, particularly when integrated with CSG operations in an advanced electronic attack environment. This will enable capability assessments at differing levels of system use to inform decisions on system employment. The Navy should apply lessons learned from CVN 78 to the future EASR configuration.

SUITABILITY

Insufficient data are available to determine the Ford-class's operational suitability. However, the following five CVN 78 systems are new to the class and are highlighted as the most significant challenges to flight operations.

AAG

The Navy reported that during CVN 78's 262-day deployment, the ship and its embarked air wing completed 8,725 arrested landings utilizing the AAG. However, DOT&E has not received sufficient data to update the reliability statistics reported in the FY23 Annual Report. Naval Air Systems Command (NAVAIR) continues to work on short- and long-term improvements to address AAG reliability degraders. However, challenges in obtaining replacement parts and the reliance on off-ship technical support remain an issue. The Navy is also using IOT&E to inform the decision of whether to retrofit the fourth AAG engine on Ford-class aircraft carriers. The fourth AAG engine was incorporated into the Ford-class design, but not installed as a cost savings measure. The fourth engine would improve the reliability and availability of AAG, improve

the pilot boarding rate, and restore a redundant capability to rig the barricade in the event of AAG engine failure, which the current configuration does not support.

EMALS

The Navy reported that during CVN 78's deployment, the ship and its embarked air wing completed 8,725 catapult launches using the EMALS. However, DOT&E has not received sufficient data to update the reliability statistics reported in the FY23 Annual Report. Despite engineering upgrades to hardware and software, reliability has not appreciably changed from prior years and reliance on off-ship technical support remains a challenge. NAVAIR is continuing development on improvements.

Advanced Weapons Elevators (AWEs)

The Navy reported that, during CVN 78's deployment, the ship's weapons department conducted 11,369 AWE runs, moving 1,829,580 pounds of ordnance to the flight deck. However, the Navy has yet to build and transfer ordnance to the flight deck at rates reflective of the Design Reference Mission. Of note, the crew is reliant on off-ship technical support for correction of hardware and software failures. DOT&E expects the SGR tests to be the first operationally representative demonstration of high ordnance throughput.

DBR

Details on DBR suitability can be found in DOT&E's classified EFR from April 2023. DBR availability declined during the FY23 COMPTUEX with the continuous demand for radar coverage and an intermittent failure observed during operations. Due to the one-of-a-kind nature of the DBR, its availability will depend on the Navy's access to replacement parts throughout the remaining life of the system. The Navy should acquire sufficient DBR

replacement parts for the interim period prior to the scheduled replacement of DBR with EASR.

Manning and Berthing

Per the Navy's Shipboard Habitability Program, all new ships are required to have a growth allowance of 10 percent of ship's company when the ship delivers. This Service Life Allowance provides both empty bunks to allow for changes in the crew composition over the ship's life and berthing to support crew turnover, visitors, and personnel temporarily assigned to the ship for repairs, inspections, test, and training. However, sufficient berthing is not installed for the Ford-class to conduct combat operations with all hands assigned a bed, due to a lack of berthing capacity for embarked units. If the ship and its embarked units were each at 100 percent manning, the ship would have a shortfall of 159 beds. These berthing shortfalls will affect quality of life onboard and could reduce the Navy's operational flexibility in employing the ship across its full spectrum of missions and logistical support roles for the CSG. Furthermore, there is potential that the berthing shortfalls could increase as the air wing diversifies to include CMV-22, F-35, and MQ-25, none of which are embarked on the Ford-class today.

SURVIVABILITY

The survivability assessment of the Ford-class against kinetic threats is based on a combination of FSST, TSST, and related modeling of the class supported by component and surrogate testing. To date, the Navy has completed all planned LFT&E, except for TSST and the final survivability assessment. The TSST is the last scheduled LFT&E event for the ship and will provide critical data on the damage control and recoverability design of the ship.

From June to August 2021, the Navy conducted FSST on CVN 78, including three shock events of increasing severity. In December 2022, DOT&E published a classified FSST report that details findings from the trial, and in July 2023, the Navy published its own FSST report. Both reports identify deficiencies that, if addressed, will improve the class's survivability against kinetic threats. The Navy has yet to issue a Shock Deficiency Correction Plan that will detail the corrective actions planned to rectify adverse findings from the FSST.

The survivability evaluation of the Ford-class in a cyber-contested environment was evaluated in March 2024 testing, and earlier land-based testing for EMALS and AAG. DOT&E's full assessment will be published following the underway test.

The survivability of the Ford-class in contested and congested electromagnetic spectrum environments is ongoing. Discussions on how to evaluate CVN 78 survivability in these environments are continuing with the Navy.

RECOMMENDATIONS

The following recommendations remain as stated in the FY23 Annual Report. The Navy should:

1. Improve the suitability of AAG, EMALS, AWE, and DBR while minimizing the requirement for off-ship and/or contractor technical support.

2. Reevaluate the timeline and better define the criteria for a decision to retrofit the fourth AAG engine.

3. Resource and execute the testing per Enterprise AW SSD TEMP 1714 and CVN 78 TEMP 1610, including the planned SGR testing, along with completing, verifying, validating, and accrediting the SGR M&S suite; underway cyber survivability testing; and self-defense tests and PRA modeling.

4. Re-examine manning and berthing for future ships of the class to ensure sufficient berthing is available and that 10 percent Service Life Allowance is allocated for future growth.

5. Prioritize and correct deficiencies identified in DOT&E's classified FSST report of December 2022.

6. Submit an update of the Ford-class TEMP for DOT&E approval in FY25 that is aligned with the new Enterprise TEMP 1910 and provides the test strategy and test resources to determine operational effectiveness of new and/or upgraded capabilities on CVN 79.

7. Verify electromagnetic spectrum compatibility during operational test to better inform effectiveness and survivability, particularly when integrated with CSG operations in an advanced electronic attack environment.

The following recommendations from the FY23 Annual Report have been updated. The Navy should:

1. Develop an effective strategy to collect data in accordance with the test plan for the remainder of IOT&E.

2. Continue to address the recommendations in DOT&E's classified self-defense interim assessment report from April 2022, and the additional recommendations in DOT&E's classified EFR from April 2023.

3. Continue to fully fund the scheduled replacement of DBR on CVN 78 with the EASR configuration.

4. Continue to develop more robust capabilities to test the cyber survivability of shipboard industrial control systems, similar to those capabilities demonstrated during the March 2024 cyber survivability testing.

5. Provide a strategy to update the survivability assessments included in the vulnerability assessment reports to reflect the ship as built to support delivery of the final survivability assessment report in 4QFY25.

6. Identify, fund, and deliver a replacement for the Navy's self-defense test ship, ex-USS Paul F. Foster, to support planned testing of CVN 79 capability.

The Navy should address the following recommendations, which are new:

1. Characterize and validate performance of the SSAM model for SGR.

2. Continue to update the IOT&E test plan for major remaining tests such as SGR, self-defense, and cyber survivability tests and submit to DOT&E for approval.[28]

Procurement of Aircraft Carriers After CVN-83

Another issue for Congress concerns the procurement of aircraft carriers after CVN-83. The question of whether the Navy should shift at some point from procuring CVNs like the Ford-class carriers to procuring smaller and perhaps nonnuclear-powered aircraft carriers has been a recurrent matter of discussion and Navy study over the years.

Although the Navy wants to achieve and maintain in coming years a fleet of 381 manned battle force ships, including 12 aircraft carriers, force-structure studies done by the Navy that eventually led to the 381-ship goal showed future Navy force structures that included 8 to 12 carriers, to be supplemented (in the case of the lower end of that range) by up to 6 light aircraft carriers (CVLs). The Navy does not currently operate CVLs. The Navy has experimented with the concept of

[28] Director, Operational Test & Evaluation, *FY 2024 Annual Report*, January 2025, pp. 212-216.

using an LHA-type amphibious assault ship with an embarked group of F-35B Joint Strike Fighters as a CVL.[29]

Advocates of smaller carriers traditionally have argued that they are individually less expensive to procure, that the Navy might be able to employ competition between shipyards in their procurement (something that the Navy cannot do with large-deck, nuclear-powered carriers like the Ford-class carrier, because only one U.S. shipyard, HII/NNS, can build aircraft carriers of that size), and that today's aircraft carriers concentrate much of the Navy's striking power into a relatively small number of expensive platforms that adversaries could focus on attacking in time of war.

Supporters of CVNs traditionally have argued that smaller carriers, though individually less expensive to procure, are less cost-effective in terms of dollars spent per aircraft embarked or aircraft sorties that can be generated; that it might be possible to use competition in procuring certain materials and components for large-deck, nuclear-powered aircraft carriers; and that smaller carriers, though perhaps affordable in larger numbers, would be individually less survivable in time of war than CVNs.[30]

Section 128(d) of the FY2016 National Defense Authorization Act (S. 1356/P.L. 114-92 of November 25, 2015) required the Navy to submit a report on potential requirements, capabilities, and alternatives for the future development of aircraft carriers that would replace or supplement the Ford-class aircraft carrier. The report, which was conducted for the Navy by the RAND Corporation, was delivered to the congressional defense committees in classified form in July 2016. An unclassified version of the report was then prepared and issued in 2017 as a publicly released RAND report.[31] The question of whether to shift to smaller aircraft carriers was also addressed in three studies on future fleet architecture that were required by Section 1067 of the FY2016 National Defense Authorization Act (S. 1356/P.L. 114-92 of November 25, 2015).

[29] See CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke; Kyle Gunn, "Lightning Carriers: The Marines' Secret Weapon in the Pacific," *Task & Purpose*, June 26, 2025; Megan Eckstein, "Light Carrier Studies Already Underway As Navy Considers Role for CVLs in Future Fleet," *USNI News*, February 1, 2021. See also Joseph Trevithick, "Navy Looking At America And Ford Class Derivatives In New Light Aircraft Carrier Studies," *The Drive*, February 2, 2021.

[30] See, for example, Talbot Manvel, "The Lightning Carrier Isn't Either," *U.S. Naval Institute Proceedings*, July 2023.

[31] Bradley Martin and Michael McMahon, *Future Aircraft Carrier Options*, Santa Monica, CA, RAND Corporation, 2017, 87 pp.

Appendix. Background Information on Two-Ship Block Buy for CVN-80 and CVN-81

This appendix presents additional background information on the two-ship block buy contract for CVN-80 and CVN-81.

The option for procuring two Ford-class carriers under a two-ship block buy contract had been discussed in this CRS report since April 2012.[32] In earlier years, the discussion focused on the option of using a block buy contract for procuring CVN-79 and CVN-80. In subsequent years, interest among policymakers focused on the option of using a block buy contract for procuring CVN-80 and CVN-81.

On March 19, 2018, the Navy released a request for proposal (RFP) to Huntington Ingalls Industries/Newport News Shipbuilding (HII/NNS) regarding a two-ship buy of some kind for CVN-80 and CVN-81. A March 20, 2018, Navy News Service report stated the following:

> The Navy released a CVN 80/81 two-ship buy Request for Proposal (RFP) to Huntington Ingalls Industries—Newport News Shipbuilding (HII-NNS) March 19 to further define the cost savings achievable with a two-ship buy.
>
> With lethality and affordability a top priority, the Navy has been working with HII-NNS over the last several months to estimate the total savings associated with procuring CVN 80 and CVN 81 as a two-ship buy.
>
> "In keeping with the National Defense Strategy, the Navy developed an acquisition strategy to combine the CVN 80 and CVN 81 procurements to better achieve the Department's objectives of building a more lethal force with greater performance and affordability," said James F. Geurts, Assistant Secretary of the Navy, Research Development and Acquisition. "This opportunity for a two-ship contract is dependent on significant savings that the shipbuilding industry and government must demonstrate. The Navy is requesting a proposal from HII-NNS in order to evaluate whether we can achieve significant savings."
>
> The two-ship buy is a contracting strategy the Navy has effectively used in the 1980s to procure Nimitz-class aircraft carriers and achieved significant acquisition cost savings compared to contracting for the ships individually. While the CVN 80/81 two-ship buy negotiations transpire, the Navy is pursuing contracting actions necessary to continue CVN 80 fabrication in fiscal year (FY) 2018 and preserve the current schedule. The Navy plans to award the CVN 80 construction contract in early FY 2019 as a two-ship buy pending Congressional approval and achieving significant savings.[33]

Section 121(a)(2) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (H.R. 5515/P.L. 115-232 of August 13, 2018) permitted the Navy, after DOD made certain certifications to Congress, to add CVN-81 to the existing contract for building CVN-80. DOD provided the required certification on December 31, 2018. On January 31, 2019, the Navy

[32] See the section entitled "Potential Two-Ship Block Buy on CVN-79 and CVN-80" in the April 4, 2012, version of CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke. In more recent years, this section was modified to discuss the option in connection with CVN-80 and CVN-81.

[33] Naval Sea Systems Command Public Affairs, "Navy Seeks Savings, Releases Two-Carrier RFP," *Navy News*, March 20, 2018. See also Megan Eckstein, "UPDATED: Navy, Newport News Taking Steps Towards Two-Carrier Buy," *USNI News*, March 19, 2018.

announced that it had awarded a two-ship fixed-price incentive (firm target) (FPIF) contract for CVN-80 and CVN-81 to HII/NNS.[34]

The two-ship contract for CVN-80 and CVN-81 can be viewed as a block buy contract because the two ships were procured in different fiscal years (CVN-80 was procured in FY2018 and CVN-81 was procured in FY2019 [or, according to the Navy's FY2021-FY2024 budget submissions, in FY2020]).[35] The Navy's previous two-ship aircraft carrier procurements occurred in FY1983 (for CVN-72 and CVN-73) and FY1988 (for CVN-74 and CVN-75). In each of those two earlier cases, however, the two ships were fully funded within a single fiscal year, making each of these cases a simple two-ship purchase (akin, for example, to procuring two Virginia-class attack submarines or two DDG-51 class destroyers in a given fiscal year) rather than a two-ship block buy (i.e., a contract spanning the procurement of end items procured across more than one fiscal year).

Compared to DOD's estimate that the two-ship block buy contract for CVN-80 and CVN-81 would produce savings of $3.9 billion (as measured from estimated costs for the two ships in the December 2017 Navy business case analysis), DOD states that "the Department of Defense's Office of Cost Assessment and Program Evaluation (CAPE) developed an Independent Estimate of Savings for the two-ship procurement and forecast savings of $3.1 billion ([in] Then-Year [dollars]), or approximately 11 percent.... The primary differences between [the] CAPE and Navy estimates of savings are in Government Furnished Equipment[36] and production change orders."[37] Within the total estimated combined reduction in cost, HII/NNS reportedly expects to save up to $1.6 billion in contractor-furnished equipment.[38]

A November 2018 DOD report to Congress that was submitted as an attachment to DOD's December 31, 2018, certification stated the following regarding the sources of cost reduction for the two-ship contract:

> The CVN 80 and CVN 81 two-ship buy expands and improves upon the affordability initiatives identified in the Annual Report on Cost Reduction Efforts for JOHN F. KENNEDY (CVN 79) and ENTERPRISE (CVN 80) as required by section 126(c) of the National Defense Authorization Act for Fiscal Year 2017 (P.L. 114-328). Production saving initiatives for single-ship buys included use of unit families in construction, pre-outfitting and complex assemblies which move work to a more efficient workspace environment, reduction in the number of superlifts,[39] and facility investments which improve the shipbuilder trade effectiveness. A two-ship buy assumes four years between

[34] See Office of the Navy Chief of Information, "Navy Awards Contract for Construction of Two Carriers," Navy News Service, January 31, 2019; Megan Eckstein, "UPDATED: Navy Awards 2-Carrier Contract to Newport News Shipbuilding," *USNI News*, January 31, 2019; Marcus Weisgerber, "US Navy Places First 2-Carrier Order in Three Decades," *Defense One*, January 31, 2019; David B. Larter, "US Navy Signs Mammoth Contract with Huntington Ingalls for Two Aircraft Carriers," *Defense News*, January 31, 2019; Rich Abott, "Navy Awards HII $15 Billion In Two Carrier Buy," *Defense Daily*, February 1, 2019.

[35] For more on block buy contracting, see CRS Report R41909, *Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress*, by Ronald O'Rourke.

[36] Government-furnished equipment (GFE) is equipment that the government purchases from supplier firms and then provides to the shipbuilder for incorporation into the ships.

[37] Department of Defense, FORD Class Aircraft Carrier Certification, CVN 80 and CVN 81 Two Ship Procurement Authority, as Required by Section 121(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232), November 2018, pp. 8-9.

[38] Rich Abott, "Navy Awards HII $15 Billion In Two Carrier Buy," *Defense Daily*, February 1, 2019. Contractor-furnished equipment (CFE) is equipment that the contractor (in this case, HII/NNS) purchases from supplier firms for incorporation into the ships.

[39] A superlift is the use of a crane to move a very large section of the ship from the land into its final position on the ship.

> ship deliveries which allows more schedule overlap, and therefore more shop-level and assembly-level production efficiencies than two single-ship buys.
>
> Procuring two ships to a single technical baseline reduces the requirement for engineering labor hours when compared to single-ship estimates. The ability to rollover production support engineering and planning products maximizes savings while recognizing the minimum amount of engineering labor necessary to address obsolescence and regulatory changes on CVN 81. The two-ship agreement with the shipbuilder achieves a 55 percent reduction in construction support engineering hours on CVN 81 and greater than 18 percent reduction in production support and planning hours compared to single ship procurements.
>
> The two-ship procurement strategy allows for serial production opportunities that promote tangible learning and reduced shop and machine set-up times. It allows for efficient use of production facilities, re-use of production jigs and fixtures, and level loading of key trades. The continuity of work allows for reductions in supervision, services and support costs. The result of these efficiencies is a production man-hours step down that is equivalent to an 82 percent learning curve since CVN 79.
>
> Key to achieving these production efficiencies is Integrated Digital Shipbuilding (iDS). The Navy's Research, Development, Test, and Evaluation (RDT&E) and the shipbuilder's investment in iDS, totaling $631 million, will reduce the amount of production effort required to build FORD Class carriers. The two-ship buy will accelerate the benefits of this approach. The ability to immediately use the capability on CVN 81 would lead to a further reduction in touch labor and services in affected value streams. The two-ship agreement with the shipbuilder represents a production man-hours reduction of over seven percent based on iDS efficiencies. Contractual authority for two ships allows the shipbuilder to maximize economic order quantity material procurement. This allows more efficient ordering and scheduling of material deliveries and will promote efficiencies through earlier ordering, single negotiations, vendor quotes, and cross program purchase orders. These efficiencies are expected to reduce material costs by about six percent more when compared to single-ship estimates. Improved material management and flexibility will prevent costly production delays. Furthermore, this provides stability within the nuclear industrial base, de-risking the COLUMBIA and VIRGINIA Class programs. The two-ship buy would provide economic stability to approximately 130,000 workers across 46 States within the industrial base.
>
> Change order requirements are likewise reduced as Government Furnished Equipment (GFE) providers will employ planning and procurement strategies based on the common technical baseline that minimize configuration changes that must be incorporated on the follow ship. Change order budget allocations have been reduced over 25 percent based on two-ship strategies.
>
> In addition to the discrete savings achieved with the shipbuilder, the two-ship procurement authority provides our partner GFE providers a similar opportunity to negotiate economic order quantity savings and achieve cross program savings when compared to single-ship estimates.[40]

An April 16, 2018, press report stated the following:

> If the Navy decides to buy aircraft carriers CVN-80 and 81 together, Newport News Shipbuilding will be able to maintain a steady workload that supports between 23,000 and 25,000 workers at the Virginia yard for the next decade or so, the shipyard president told reporters last week.

[40] Department of Defense, FORD Class Aircraft Carrier Certification, CVN 80 and CVN 81 Two Ship Procurement Authority, as Required by Section 121(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (P.L. 115-232), November 2018, pp. 6-7.

Part of the appeal of buying the two carriers together is that the Navy would also buy them a bit closer together: the ships would be centered about three-and-a-half or four years apart, instead of the five-year centers for recent carrier acquisition, Newport News Shipbuilding President Jennifer Boykin told reporters.

Boykin said the closer ship construction centers would allow her to avoid a "labor valley" where the workforce levels would dip down after one ship and then have to come back up, which is disruptive for employees and costly for the company.

If this two-carrier buy goes through, the company would avoid the labor valley altogether and ensure stability in its workforce, Boykin said in a company media briefing at the Navy League's Sea Air Space 2018 symposium. That workforce stability contributes to an expected $1.6 billion in savings on the two-carrier buy from Newport News Shipbuilding's portion of the work alone, not including government-furnished equipment....

Boykin said four main things contribute to the expected $1.6 billion in savings from the two-carrier buy. First, "if you don't have the workforce valley, there's a labor efficiency that represents savings."

Second, "if you buy two at once, my engineering team doesn't have to produce two technical baselines, two sets of technical products; they only have to produce one, and the applicability is to both, so there's savings there. When we come through the planning, the build plan of how we plan to build the ship, the planning organization only has to put out one plan and the applicability is to both, so there's savings there."

The third savings is a value of money over time issue, she said, and fourth is economic order quantity savings throughout the entire supply chain.[41]

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[41] Megan Eckstein, "Newport News Would Save $1.6 Billion, Maintain Stable Workforce of 25,000 Under 2 Proposed Carrier Buy," *USNI News*, April 16, 2018. See also Rich Abott, "HII Sees Two Carrier Buy Saving $1.6 Billion Before GFE," *Defense Daily*, April 11, 2018: 10-11.

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