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Coast Guard Cutter Procurement: Background and Issues for Congress

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Summary

The Coast Guard's program of record (POR) calls for procuring 8 National Security Cutters (NSCs), 25 Offshore Patrol Cutters (OPCs), and 58 Fast Response Cutters (FRCs) as replacements for 90 aging Coast Guard high-endurance cutters, medium-endurance cutters, and patrol craft. The Coast Guard's proposed FY2020 budget requests a total of $657 million in procurement funding for the NSC, OPC, and FRC programs.

NSCs are the Coast Guard's largest and most capable general-purpose cutters; they are intended to replace the Coast Guard's 12 aged Hamilton-class high-endurance cutters. NSCs have an estimated average procurement cost of about $670 million per ship. Although the Coast Guard's POR calls for procuring a total of 8 NSCs to replace the 12 Hamilton-class cutters, Congress through FY2019 has funded 11 NSCs, including the 10th and 11th in FY2018. Eight NSCs have entered service; the seventh and eighth were commissioned into service on August 24, 2019. The 9th through 11th are under construction; the 9th is scheduled for delivery in 2021. The Coast Guard's proposed FY2020 budget requests $60 million in procurement funding for the NSC program; this request does not include funding for a 12th NSC.

OPCs are to be smaller, less expensive, and in some respects less capable than NSCs; they are intended to replace the Coast Guard's 29 aged medium-endurance cutters. Coast Guard officials describe the OPC program as the service's top acquisition priority. OPCs have an estimated average procurement cost of about $421 million per ship. On September 15, 2016, the Coast Guard awarded a contract with options for building up to nine OPCs to Eastern Shipbuilding Group of Panama City, FL. The first OPC was funded in FY2018 and is to be delivered in 2021. The second OPC and long lead time materials (LLTM) for the third were funded in FY2019. The Coast Guard's proposed FY2020 budget requests $457 million in procurement funding for the third OPC, LLTM for the fourth and fifth, and other program costs.

FRCs are considerably smaller and less expensive than OPCs; they are intended to replace the Coast Guard's 49 aging Island-class patrol boats. FRCs have an estimated average procurement cost of about $58 million per boat. A total of 56 have been funded through FY2019, including 6 in FY2019. Four of the 56 are to be used by the Coast Guard in the Persian Gulf and are not counted against the Coast Guard's 58-ship POR for the program, which relates to domestic operations. Excluding these 4 OPCs, a total of 52 FRCs for domestic operations have been funded through FY2019. The 33rd FRC was commissioned into service on June 8, 2019. The Coast Guard's proposed FY2020 budget requests $140 million in acquisition funding for the procurement of two more FRCs for domestic operations.

The NSC, OPC, and FRC programs pose several issues for Congress, including the following:

- whether to provide funding in FY2020 for the procurement of a 12th NSC;
- whether to fund the procurement in FY2020 of two FRCs, as requested by the Coast Guard, or some higher number, such as four or six;
- whether to use annual or multiyear contracting for procuring OPCs;
- the annual procurement rate for the OPC program;
- the impact of Hurricane Michael on Eastern Shipbuilding of Panama City, FL, the shipyard that is to build the first nine OPCs; and
- the planned procurement quantities for NSCs, OPCs, and FRCs.

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Introduction

This report provides background information and potential oversight issues for Congress on the Coast Guard's programs for procuring 8 National Security Cutters (NSCs), 25 Offshore Patrol Cutters (OPCs), and 58 Fast Response Cutters (FRCs). The Coast Guard's proposed FY2020 budget requests a total of $657 million in procurement funding for the NSC, OPC, and FRC programs.

The issue for Congress is whether to approve, reject, or modify the Coast Guard's funding requests and acquisition strategies for the NSC, OPC, and FRC programs. Congress's decisions on these three programs could substantially affect Coast Guard capabilities and funding requirements, and the U.S. shipbuilding industrial base.

The NSC, OPC, and FRC programs have been subjects of congressional oversight for several years, and were previously covered in other CRS reports that are now archived.[1] CRS testified on the Coast Guard's cutter acquisition programs most recently on November 29.[2] The Coast Guard's plans for modernizing its fleet of polar icebreakers are covered in a separate CRS report.[3]

Background

Older Ships to Be Replaced by NSCs, OPCs, and FRCs

The 91 planned NSCs, OPCs, and FRCs are intended to replace 90 older Coast Guard ships—12 high-endurance cutters (WHECs), 29 medium-endurance cutters (WMECs), and 49 110-foot patrol craft (WPBs).[4] The Coast Guard's 12 Hamilton (WHEC-715) class high-endurance cutters entered service between 1967 and 1972.[5] The Coast Guard's 29 medium-endurance cutters include 13 Famous (WMEC-901) class ships that entered service between 1983 and 1991,[6] 14

[1] This CRS report was first published on June 13, 2012. The earlier CRS reports were CRS Report RL33753, *Coast Guard Deepwater Acquisition Programs: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke (first version December 18, 2006, final [i.e., archived] version January 20, 2012); CRS Report RS21019, *Coast Guard Deepwater Program: Background and Issues for Congress, by Ronald O'Rourke* (first version September 25, 2001, final [i.e., archived] version December 8, 2006); and CRS Report 98-830 F, *Coast Guard Integrated Deepwater System: Background and Issues for Congress*, by Ronald O'Rourke (first version October 5, 1998, final [i.e., archived] version June 1, 2001). From the late 1990s until 2007, the Coast Guard's efforts to acquire NSCs, OPCs, and FRCs were parts of a larger, integrated Coast Guard acquisition effort aimed at acquiring several new types of cutters and aircraft that was called the Integrated Deepwater System (IDS) program, or Deepwater for short. In 2007, the Coast Guard broke up the Deepwater effort into a series of individual cutter and aircraft acquisition programs, but continued to use the term Deepwater as a shorthand way of referring collectively to these now-separated programs. In its FY2012 budget submission, the Coast Guard stopped using the term Deepwater as a way of referring to these programs.

[2] See CRS Testimony TE10030, *Icebreaker Acquisition and the Need for a National Maritime Strategy*, by Ronald O'Rourke, November 29, 2018, which includes discussions of the NSC, OPC, and FRC programs in Appendix E. See also CRS Testimony TE10029, *Building the Fleets of the Future: Coast Guard and NOAA Fleet Recapitalization*, by Ronald O'Rourke, October 11, 2018.

[3] CRS Report RL34391, *Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[4] In the designations WHEC, WMEC, and WPB, W means Coast Guard ship, HEC stands for high-endurance cutter, MEC stands for medium-endurance cutter, and PB stands for patrol boat.

[5] Hamilton-class cutters are 378 feet long and have a full load displacement of about 3,400 tons.

[6] Famous-class cutters are 270 feet long and have a full load displacement of about 1,800 tons.

Reliance (WMEC-615) class ships that entered service between 1964 and 1969,[7] and 2 one-of-a-kind cutters that originally entered service with the Navy in 1944 and 1971 and were later transferred to the Coast Guard.[8] The Coast Guard's 49 110-foot Island (WPB-1301) class patrol boats entered service between 1986 and 1992.[9]

Many of these 90 ships are manpower-intensive and increasingly expensive to maintain, and have features that in some cases are not optimal for performing their assigned missions. Some of them have already been removed from Coast Guard service: 8 of the Island-class patrol boats were removed from service in 2007 following an unsuccessful effort to modernize and lengthen them to 123 feet; additional Island-class patrol boats are being decommissioned as new FRCs enter service; the one-of-a-kind medium-endurance cutter that originally entered service with the Navy in 1944 was decommissioned in 2011; and Hamilton-class cutters are being decommissioned as new NSCs enter service. A July 2012 Government Accountability Office (GAO) report discusses the generally poor physical condition and declining operational capacity of the Coast Guard's older high-endurance cutters, medium-endurance cutters, and 110-foot patrol craft.[10]

Missions of NSCs, OPCs, and FRCs

NSCs, OPCs, and FRCs, like the ships they are intended to replace, are to be multimission ships for routinely performing 7 of the Coast Guard's 11 statutory missions, including

- search and rescue (SAR);
- drug interdiction;
- migrant interdiction;
- ports, waterways, and coastal security (PWCS);
- protection of living marine resources;
- other/general law enforcement; and
- defense readiness operations.[11]

Smaller Coast Guard patrol craft and boats contribute to the performance of some of these seven missions close to shore. NSCs, OPCs, and FRCs perform them both close to shore and in the deepwater environment, which generally refers to waters more than 50 miles from shore.

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[7] Reliance-class cutters are 210 feet long and have a full load displacement of about 1,100 tons.

[8] These were the *Acushnet* (WMEC-167), which originally entered service with the Navy in 1944, and the *Alex Haley* (WMEC-39), which originally entered service with the Navy in 1971. The *Acushnet* served in the Navy from until 1946, when it was transferred to the Coast Guard. The ship was about 214 feet long and had a displacement of about 1,700 tons. The *Alex Haley* served in the Navy until 1996. It was transferred to the Coast Guard in 1997, converted into a cutter, and reentered service with the Coast Guard in 1999. It is 282 feet long and has a full load displacement of about 2,900 tons.

[9] Island-class boats are 110 feet long and have a full load displacement of about 135 to 170 tons.

[10] Government Accountability Office, *Coast Guard[:]Legacy Vessels' Declining Conditions Reinforce Need for More Realistic Operational Targets*, GAO-12-741, July 2012, 71 pp.

[11] The four statutory Coast Guard missions that are not to be routinely performed by NSCs, OPCs, and FRCs are marine safety, aids to navigation, marine environmental protection, and ice operations. These missions are performed primarily by other Coast Guard ships. The Coast Guard states, however, that "while [NSCs, OPCs, and FRCs] will not routinely conduct [the] Aids to Navigation, Marine Safety, or Marine Environmental Protection missions, they may periodically be called upon to support these missions (i.e., validate the position of an Aid to Navigation, transport personnel or serve as a Command and Control platform for a Marine Safety or Marine Environmental Response mission, etc.)." (Source: Coast Guard information paper provided to CRS on June 1, 2012.)

NSC Program

National Security Cutters (**Figure 1**)—also known as Legend (WMSL-750)[12] class cutters because they are being named for legendary Coast Guard personnel[13]—are the Coast Guard's largest and most capable general-purpose cutters.[14] They are larger and technologically more advanced than Hamilton-class cutters, and are built by Huntington Ingalls Industries' Ingalls Shipbuilding of Pascagoula, MS (HII/Ingalls).

Figure 1. National Security Cutter

Source: U.S. Coast Guard photo accessed May 2, 2012, at http://www.flickr.com/photos/coast_guard/5617034780/sizes/l/in/set-72157629650794895/.

[12] In the designation WMSL, W means Coast Guard ship and MSL stands for maritime security cutter, large.

[13] For a Coast Guard news release that mentions the naming rule for the class, see U.S. Coast Guard, "Acquisition Update: Keel Authenticated for the Fifth National Security Cutter," May 17, 2013.

[14] The NSC design is 418 feet long and has a full load displacement of about 4,500 tons. The displacement of the NSC design is about equal to that of Navy's now-retired Oliver Hazard Perry (FFG-7) class frigates, which were 453 feet long and had a full load displacement of about 4,200 tons. The Coast Guard's three polar icebreakers are much larger than NSCs, but are designed for a more specialized role of operations in polar waters. The Coast Guard states that

> The largest and most technologically advanced of the Coast Guard's newest classes of cutters, the NSCs replace the aging 378-foot high endurance cutters, which have been in service since the 1960s. Compared to legacy cutters, the NSCs' design provides better sea-keeping and higher sustained transit speeds, greater endurance and range, and the ability to launch and recover small boats from astern, as well as aviation support facilities and a flight deck for helicopters and unmanned aerial vehicles.
>
> ("National Security Cutter," accessed April 19, 2018, at https://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Programs/Surface-Programs/National-Security-Cutter/.)

The Coast Guard's acquisition program of record (POR)—the service's list, established in 2004, of planned procurement quantities for various new types of ships and aircraft—calls for procuring 8 NSCs as replacements for the service's 12 Hamilton-class high-endurance cutters. The Coast Guard's FY2019 budget submission estimated the total acquisition cost of a nine-ship NSC program at $6.030 billion, or an average of about $670 million per ship.[15]

Although the Coast Guard's POR calls for procuring a total of 8 NSCs to replace the 12 Hamilton-class cutters, Congress through FY2018 has funded 11 NSCs, including the 10th and 11th in FY2018. Eight NSCs have entered service; the seventh and eighth were commissioned into service on August 24, 2019. The 9th through 11th are under construction; the 9th is scheduled for delivery in 2021. The Coast Guard's proposed FY2020 budget requests $60 million in procurement funding for the NSC program; this request does not include funding for a 12th NSC.

For additional information on the status and execution of the NSC program from a May 2018 GAO report, see **Appendix C**.

OPC Program

Offshore Patrol Cutters (**Figure 2**, **Figure 3**, **Figure 4**, and **Figure 5**)—also known as Heritage (WMSM-915)[16] class cutters because they are being named for past cutters that played a significant role in the history of the Coast Guard and the Coast Guard's predecessor organizations[17]—are to be somewhat smaller and less expensive than NSCs, and in some respects less capable than NSCs.[18] In terms of full load displacement, OPCs are to be about 80% as large as NSCs.[19] Coast Guard officials describe the OPC program as the service's top acquisition priority. OPCs are being built by Eastern Shipbuilding Group of Panama City, FL.

[15] Source: Coast Guard Five-Year (FY2019-FY2023) Capital Investment Plan (CIP) funding table for the Procurement, Construction and Improvements (PC&I) account.

[16] In the designation WMSM, W means Coast Guard ship and MSM stands for maritime security cutter, medium.

[17] For the naming rule for the class and a list of the names of the first 11 OPCs, see U.S. Coast Guard, "The Offshore Patrol Cutter (OPC) Is The Coast Guard's Highest Investment Priority and Will Play A Critical Role in the Service's Future," undated, accessed August 15, 2017, at http://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Newsroom/OPC_Day/. See also Sam LaGrone, "Coast Guard Celebrates Birthday by Naming 11 Planned Offshore Patrol Cutters," *USNI News*, August 4, 2017 (updated August 5, 2017).

[18] The service states that OPCs

> The OPCs will provide the majority of offshore presence for the Coast Guard's cutter fleet, bridging the capabilities of the 418-foot national security cutters, which patrol the open ocean, and the 154-foot fast response cutters, which serve closer to shore. The OPCs will conduct missions including law enforcement, drug and migrant interdiction, search and rescue, and other homeland security and defense operations. Each OPC will be capable of deploying independently or as part of task groups and serving as a mobile command and control platform for surge operations such as hurricane response, mass migration incidents and other events. The cutters will also support Arctic objectives by helping regulate and protect emerging commerce and energy exploration in Alaska.
>
> ("Offshore Patrol Cutter," accessed April 20, 2018, https://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Programs/Surface-Programs/Offshore-Patrol-Cutter/Offshore-Patrol-Cutter-Program-Profile/.)

[19] As of May 26, 2017, the OPC's light ship displacement (i.e., its "empty" displacement, without fuel, water, ballast, stores, and crew) was preliminarily estimated at about 2,640 to 2,800 tons, and its full load displacement was preliminarily estimated at about 3,500 to 3,730 tons. (Source: Figures provided to CRS by Cost Guard liaison office, May 26, 2017.) In terms of full load displacement, this would make OPCs roughly 80% as large as NSCs.

Figure 2. Offshore Patrol Cutter

Artist's rendering

Source: Photograph accompanying Kirk Moore, "Coast Guard's Birthday Present: Naming the Next Cutters," *WorkBoat*, August 4, 2017. A caption to the rendering credits the rendering to Eastern Shipbuilding Group.

Figure 3. Offshore Patrol Cutter

Artist's rendering

Source: "Offshore Patrol Cutter Notional Design Characteristics and Performance," accessed September 16, 2016, at https://www.dcms.uscg.mil/Portals/10/CG-9/Surface/OPC/OPC%20Placemat%2036x24.pdf?ver=2018-10-02-134225-297.

Figure 4. Offshore Patrol Cutter

Artist's rendering

Source: Eastern Shipbuilding Group (http://www.easternshipbuilding.com/), accessed September 9, 2019.

Figure 5. Offshore Patrol Cutter

Artist's rendering

Source: Image received from Coast Guard liaison office, May 25, 2017.

The Coast Guard's POR calls for procuring 25 OPCs as replacements for the service's 29 medium-endurance cutters. The Coast Guard's FY2019 budget submission estimated the total

acquisition cost of the 25 ships at $10.523 billion, or an average of about $421 million per ship.[20] The first OPC was funded in FY2018 and is to be delivered in 2021. The second OPC and long lead time materials (LLTM) for the third were funded in FY2019. The Coast Guard's proposed FY2020 budget requests $457 million in procurement funding for the third OPC, LLTM for the fourth and fifth, and other program costs.

The Coast Guard's Request for Proposal (RFP) for the OPC program, released on September 25, 2012, established an affordability requirement for the program of an average unit price of $310 million per ship, or less, in then-year dollars (i.e., dollars that are not adjusted for inflation) for ships 4 through 9 in the program.[21] This figure represents the shipbuilder's portion of the total cost of the ship; it does not include the cost of government-furnished equipment (GFE) on the ship,[22] or other program costs—such as those for program management, system integration, and logistics—that contribute to the above-cited figure of $421 million per ship.[23]

At least eight shipyards expressed interest in the OPC program.[24] On February 11, 2014, the Coast Guard announced that it had awarded Preliminary and Contract Design (P&CD) contracts to three of those eight firms—Bollinger Shipyards of Lockport, LA; Eastern Shipbuilding Group of Panama City, FL; and General Dynamics' Bath Iron Works (GD/BIW) of Bath, ME.[25] On September 15, 2016, the Coast Guard announced that it had awarded the detail design and construction (DD&C) contract to Eastern Shipbuilding. The contract covers detail design and

[20] Source: Coast Guard Five-Year (FY2019-FY2023) Capital Investment Plan (CIP) funding table for the Procurement, Construction and Improvements (PC&I) account.

[21] Source: Section C.5 of the RFP, accessed October 31, 2012, at http://www.uscg.mil/ACQUISITION/newsroom/updates/opc092512.asp.

[22] GFE is equipment that the government procures and then delivers to the shipyard for installation on the ship.

[23] Source: Coast Guard emails to CRS dated June 25, 2013.

[24] The firms were the following: Bollinger Shipyards of Lockport, LA; Eastern Shipbuilding Group of Panama City, FL; General Dynamics Bath Iron Works (GD/BIW) of Bath, ME; Huntington Ingalls Industries (HII) of Pascagoula, MS; Marinette Marine Corporation of Marinette, WS; General Dynamics National Steel and Shipbuilding Company (GD/NASSCO) of San Diego, CA; Vigor Shipyards of Seattle, WA; and VT Halter Marine of Pascagoula, MS. (Source: U. S. Coast Guard Offshore Patrol Cutter (OPC) List of Interested Contractors Updated July 2012, accessed online October 23, 2012, at http://www.uscg.mil/ACQUISITION/opc/pdf/companiesinterested.pdf; and Kevin Brancato and Anne Laurent, *Coast Guard's $12 Billion Cutter Competition Spurs Eight Shipyards to Dive In*, Bloomberg Government Study, November 8, 2012, 6 pp. The Coast Guard document states that these firms "expressed interest in the Offshore Patrol Cutter acquisition and have agreed to their names provided on the Coast Guard website." See also Stew Magnuson, "New Coast Guard Cutter Sparks Fierce Competition Among Shipbuilders," *National Defense* (*www.nationaldefensemagazine.org*), April 2013, accessed March 26, 2013, at http://www.nationaldefensemagazine.org/articles/2013/4/1/2013april-new-coast-guard-cutter-sparks-fierce-competition-among-shipbuilders.)

[25] "Acquisition Update: U.S. Coast Guard Awards Three Contracts for Offshore Patrol Cutter Preliminary and Contract Design," February 11, 2014, accessed February 14, 2014, at https://www.dcms.uscg.mil/Portals/10/CG-9/Newsroom/In%20The%20News%20Archives/2014/opc021114.pdf?ver=2017-05-23-145011-727. HII and VT Halter Marine reportedly filed protests of the Coast Guard's award decision on February 24 and 25, respectively. The Coast Guard issued stop work orders to Bollinger, Eastern, and GD/BIW pending GAO's rulings on the protests. (Calvin Biesecker, "Coast Guard Issues Stop Work Orders On OPC Following Protests," *Defense Daily*, February 28, 2014: 2-3. See also Christopher P. Cavas, "Ingalls Protesting US Coast Guard Cutter Contract," *DefenseNews.com*, February 26, 2014.) On June 5, 2014, it was reported that GAO had rejected the protests, and that the Coast Guard had directed Bollinger, Eastern, and GD/BIW to resume their work. (Calvin Biesecker, "Coast Guard Directs Design Work Continue On OPC After GAO Denies Protests," *Defense Daily*, June 5, 2014: 1; Christopher P. Cavas, "US Coast Guard Cutter Award Upheld," *Defense News* (http://www.defensenews.com), June 5, 2014. For the text of the decision, see Government Accountability Office, Decision in the Matter of Huntington Ingalls Industries, Inc.; VT Halter Marine, Inc., June 2, 2014.)

production of up to 9 OPCs and has a potential value of $2.38 billion if all options are exercised.[26]

For additional information on the status and execution of the OPC program from a May 2018 GAO report, see **Appendix C**.

FRC Program

Fast Response Cutters (**Figure 6**)—also called Sentinel (WPC-1101)[27] class patrol boats because they are being named for enlisted leaders, trailblazers, and heroes of the Coast Guard and its predecessor services of the U.S. Revenue Cutter Service, U.S. Lifesaving Service, and U.S. Lighthouse Service[28]—are considerably smaller and less expensive than OPCs, but are larger than the Coast Guard's older patrol boats.[29] FRCs are built by Bollinger Shipyards of Lockport, LA.

The Coast Guard's POR calls for procuring 58 FRCs as replacements for the service's 49 Island-class patrol boats.[30] The POR figure of 58 FRCs is for domestic operations. The Coast Guard, however, operates six Island-class patrol boats in the Persian Gulf area as elements of a Bahrain-based Coast Guard unit, called Patrol Forces Southwest Asia (PATFORSWA), which is the Coast Guard's largest unit outside the United States.[31] Providing FRCs as one-for-one replacements for

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[26] "Acquisition Update: Coast Guard Selects Offshore Patrol Cutter Design," September 15, 2016, accessed September 16, 2016, at https://www.dcms.uscg.mil/Portals/10/CG-9/Newsroom/In%20The%20News%20Archives/2016/opc091516.pdf?ver=2017-05-23-124855-680. An October 7, 2016, press report states that "after no protests were filed by the losing bidders to build the Coast Guard's new class of medium-endurance cutters, the service this week directed Eastern Shipbuilding Group to proceed with detail design and construction of the Offshore Patrol Cutter (OPC).... The period for the losing bidders to file a protest ended at close of business on Monday [October 3]." (Calvin Biesecker, "Coast Guard Directs Eastern Shipbuilding To Move Forward With Offshore Patrol Cutter," *Defense Daily*, October 7, 2016, p. 3. See also "Acquisition Update: Coast Guard Moves Forward To Next Phase Of OPC Acquisition," October 5, 2016, accessed march 20, 2016, at https://www.dcms.uscg.mil/Portals/10/CG-9/Newsroom/In%20The%20News%20Archives/2016/opc100516.pdf?ver=2017-05-23-153912-247.)

On September 7, 2017, the Coast Guard exercised a fixed-price option to its contract with Eastern Shipbuilding to procure long lead time materials (LLTM) for the first OPC; the total value of the option is $41.68 million. ("Coast Guard Exercises Long Lead Time Materials Option For First Offshore Patrol Cutter," September 7, 2017, accessed October 25, 2017, at http://www.dcms.uscg.mil/Our-Organization/Assistant-Commandant-for-Acquisitions-CG-9/Newsroom/OPC090717/.)

[27] In the designation WPC, W means Coast Guard ship and PC stands for patrol craft.

[28] Source for class naming rule: U.S. Coast Guard bulletin, "ALCOAST 349/17 - Nov 2017 New Fast Response Cutters Named for Coast Guard heroes," November 22, 2017, accessed November 20, 2017, at https://content.govdelivery.com/accounts/USDHSCG/bulletins/1c6c844.

[29] FRCs are 154 feet long and have a full load displacement of 353 tons.

[30] The Coast Guard states that

> The planned fleet of FRCs will conduct primarily the same missions as the 110' patrol boats being replaced. In addition, the FRC will have several increased capabilities enhancing overall mission execution. The FRC is designed for rapid response, with approximately a 28 knot speed capability, and will typically operate in the coastal zones. Examples of missions that FRCs will complete include SAR, Migrant Interdiction, Drug Interdiction and Ports Waterways and Coastal Security.
>
> FRCs will provide enhanced capabilities over the 110's including improved C4ISR capability and interoperability; stern launch and recovery (up through sea state 4) of a 40 knot, Over-the-Horizon, 7m cutter boat; a remote operated, gyro stabilized MK38 Mod 2, 25mm main gun; improved sea keeping; and enhanced crew habitability.
>
> (*Department of Homeland Security, United States Coast Guard, Fiscal Year 2013 Congressional Justification*, p. CG-AC&I-28 (pdf page 182 of 400).)

[31] For additional information on PATFORSWA, see U.S. Coast Guard, "Patrol Forces Southwest Asia, PATFORSWA," accessed April 24, 2019, at https://www.atlanticarea.uscg.mil/Our-Organization/Area-Units/

all six of the Island-class patrol boats in PATFORSWA would result in a combined POR+PATFORSWA figure of 64 FRCs.

Figure 6. Fast Response Cutter

With an older Island-class patrol boat behind

Source: U.S. Coast Guard photo accessed May 4, 2012, at http://www.flickr.com/photos/coast_guard/6871815460/sizes/l/in/set-72157629286167596/.

The Coast Guard's FY2019 budget submission estimated the total acquisition cost of the 58 cutters at $3.748.1 billion, or an average of about $65 million per cutter.[32] A total of 56 FRCs have been funded through FY2019, including 6 in FY2019. Four of the 56 (2 of the FRCs funded in FY2018 and 2 of the FRC funded in FY2019) are to be used for replacing PATFORSWA cutters and consequently are not counted against the Coast Guard's 58-ship POR for the program. Excluding these 4 OPCs, a total of 52 FRCs for domestic operations have been funded through FY2019.

The 33rd FRC was commissioned into service on June 8, 2019. The Coast Guard's proposed FY2020 budget requests $140 million in acquisition funding for the procurement of two more FRCs for domestic operations.

For additional information on the status and execution of the FRC program from a May 2018 GAO report, see **Appendix C**.

PATFORSWA/, U.S. Coast Guard, "CG Patrol Forces SWA Org Chart," accessed April 24, 2019, at https://www.atlanticarea.uscg.mil/Our-Organization/Area-Units/PATFORSWA/Departments/; Edward H. Lundquist, "PATFORSWA Serves Forward in the Arabian Gulf," *Defense Media Network*, March 19, 2018; Eric D. Nielsen (posted by Connie Terrell), "PATFORSWA: Guardians of the Arabian Gulf," *Coast Guard Compass*, August 22, 2016.

[32] Government Accountability Office, *Home Security Acquisitions[:] Leveraging Programs' results Could Further DHS's Progress to Improve Portfolio Management*, May 2018, GAO-18-339SP, p. 81.

Funding in FY2013-FY2020 Budget Submissions

Table 1 shows annual requested and programmed acquisition funding for the NSC, OPC, and FRC programs in the Coast Guard's FY2013-FY2020 budget submissions. Actual appropriated figures differ from these requested and projected amounts.

Issues for Congress

FY2020 Funding for a 12th NSC

One issue for Congress is whether to whether to provide funding in FY2020 for the procurement of a 12th NSC. Funding long lead time materials (LLTM) for a 12th NSC in FY2020 could require tens of millions of dollars; fully funding the procurement of a 12th NSC in FY2020 could require upwards of $700 million.

Supporters of providing funding for a 12th NSC in FY2020 could argue that a total of 12 NSCs would provide one-for-one replacements for the 12 retiring Hamilton-class cutters; that Coast Guard analyses showing a need for no more than 9 NSCs assumed dual crewing of NSCs—something that has not worked as well as expected; and that the Coast Guard's POR record includes only about 61% as many new cutters as the Coast Guard has calculated would be required to fully perform the Coast Guard's anticipated missions in coming years (see "Planned NSC, OPC, and FRC Procurement Quantities" below, as well as **Appendix A**).

Skeptics or opponents of providing funding for a 12th NSC in FY2019 could argue that the Coast Guard's POR includes only 8 NSCs, that the Coast Guard's fleet mix analyses (see "Planned NSC, OPC, and FRC Procurement Quantities" below, as well as **Appendix A**) have not shown a potential need for more than 9 NSCs, and that in a situation of finite Coast Guard budgets, providing funding for a 12th NSC might require reducing funding for other FY2020 Coast Guard programs.

Whether to Procure Two FRCs or a Higher Number in FY2020

Another issue for Congress is whether to fund the procurement in FY2020 of two FRCs, as requested by the Coast Guard, or some higher number, such as four or six. Supporters of funding the procurement of a higher number could argue that FRCs in past years have been procured at annual rates of up to six per year; that procuring them at higher annual rates reduces their unit procurement costs due to improved production economies of scale; and that procuring four or six FRCs in FY2020 would accelerate the replacement of aging and less-capable Island-class patrol boats with new and more capable FRCs.

Opponents of procuring more than two FRCs in FY2020, while acknowledging these points, could argue that in a situation of finite Coast Guard funding, procuring more than two could require offsetting reductions in funding for other FY2020 Coast Guard programs, producing an uncertain net result on overall Coast Guard capabilities, and that replacing Island-class patrol boats, while desirable, is not so urgent a requirement that the procurement of FRCs needs to be accelerated beyond what the Coast Guard plans under its FY2020 budget submission.

Table 1. NSC, OPC, and FRC Funding in FY2013-FY2020 Budget Submissions

Figures in millions of then-year dollars

Budget	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24
NSC program												
FY13	683	0	0	0	0							
FY14		16	710	38	0	45						
FY15			638	75	130	30	47					
FY16				91.4	132	95	30	15				
FY17					127	95	65	65	21			
FY18						54	65	65	21	6.6		
FY19							65	57.7	21	6.6	0	
FY20								60	n/a	n/a	n/a	n/a
OPC program												
FY13	30	50	40	200	530							
FY14		25	65	200	530	430						
FY15			20	90	100	530	430					
FY16				18.5	100	530	430	430				
FY17					100	530	430	530	770			
FY18						500	400	457	716	700		
FY19							400	457	716	700	689	
FY20								457	n/a	n/a	n/a	n/a
FRC program												
FY13	139	360	360	360	360							
FY14		75	110	110	110	110						
FY15			110	340	220	220	315					
FY16				340	325	240	240	325				
FY17					240	240	325	325	18			
FY18						240	335	335	26	18		
FY19							240	340	20	20	20	
FY20								140	n/a	n/a	n/a	n/a
Total												
FY13	852	410	400	560	890							
FY14		716	885	348	640	585						
FY15			768	505	450	780	792					
FY16				449.9	557	865	700	370				
FY17					467	865	820	920	809			
FY18						794	800	857	763	724.6		
FY19							705	854.7	757	726.6	709	
FY20								657	n/a	n/a	n/a	n/a

Source: Table prepared by CRS based on FY2013-FY2020 budget submissions.

Note: n/a means not available.

Annual or Multiyear (Block Buy) Contracting for OPCs

Another issue for Congress is whether to acquire OPCs using annual contracting or multiyear contracting. The Coast Guard currently plans to use a contract with options for procuring the first nine OPCs. Although a contract with options may look like a form of multiyear contracting, it operates more like a series of annual contracts. Contracts with options do not achieve the

reductions in acquisition costs that are possible with multiyear contracting. Using multiyear contracting involves accepting certain trade-offs.[33]

One form of multiyear contracting, called block buy contracting, can be used at the start of a shipbuilding program, beginning with the first ship. (Indeed, this was a principal reason why block buy contracting was in effect invented in FY1998, as the contracting method for procuring the Navy's first four Virginia-class attack submarines.[34]) Section 311 of the Frank LoBiondo Coast Guard Authorization Act of 2018 (S. 140/P.L. 115-282 of December 4, 2018) provides permanent authority for the Coast Guard to use block buy contracting with economic order quantity (EOQ) purchases (i.e., up-front batch purchases) of components in its major acquisition programs. The authority is now codified at 14 U.S.C. 1137.

CRS estimates that if the Coast Guard were to use block buy contracting with EOQ purchases of components for acquiring the first several OPCs, and either block buy contracting with EOQ purchases or another form of multiyear contracting known as multiyear procurement (MYP)[35] with EOQ purchases for acquiring the remaining ships in the program, the savings on the total acquisition cost of the 25 OPCs (compared to costs under contracts with options) could amount to roughly $1 billion. CRS also estimates that acquiring the first nine ships in the OPC program under the current contract with options could forego roughly $350 million of the $1 billion in potential savings.

One potential option for the subcommittee would be to look into the possibility of having the Coast Guard either convert the current OPC contract at an early juncture into a block buy contract with EOQ authority, or, if conversion is not possible, replace the current contract at an early juncture with a block buy contract with EOQ authority.[36] Replacing the current contract with a block buy contract might require recompeting the program, which would require effort on the Coast Guard's part and could create business risk for Eastern Shipbuilding Group, the shipbuilder that holds the current contract. On the other hand, the cost to the Coast Guard of recompeting the program would arguably be small relative to a potential additional savings of perhaps $300 million, and Eastern arguably would have a learning curve advantage in any new competition by virtue of its experience in building the first OPC.

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[33] These trade-offs include the following:

- reduced congressional control over year-to-year spending, and tying the hands of future Congresses;
- reduced flexibility for making changes in Coast Guard acquisition programs in response to unforeseen changes in strategic or budgetary circumstances (which can cause any needed funding reductions to fall more heavily on acquisition programs not covered by multiyear contracts);
- a potential need to shift funding from later fiscal years to earlier fiscal years to fund economic order quantity (EOQ) purchases (i.e., up-front batch purchases) of components;
- the risk of having to make penalty payments to shipbuilders if multiyear contracts need to be terminated due to unavailability of funds needed for the continuation of the contracts; and
- the risk that materials and components purchased for ships to be procured in future years might go to waste if those ships are not eventually procured.

[34] For additional discussion, see CRS Report R41909, *Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress*, by Ronald O'Rourke and Moshe Schwartz.

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

[36] As part of the replacement scenario, the Coast Guard could end the implementation of the current contract with options by not exercising an option.

Annual OPC Procurement Rate

The current procurement profile for the OPC, which reaches a maximum projected annual rate of two ships per year, would deliver OPCs many years after the end of the originally planned service lives of the medium-endurance cutters that they are to replace. Coast Guard officials have testified that the service plans to extend the service lives of the medium-endurance cutters until they are replaced by OPCs. There will be maintenance and repair expenses associated with extending the service lives of medium-endurance cutters, and if the Coast Guard does not also make investments to increase the capabilities of these ships, the ships may have less capability in certain regards than OPCs.[37]

One possible option for addressing this situation would be to increase the maximum annual OPC procurement rate from the currently planned two ships per year to three or four ships per year. Doing this could result in the 25th OPC being delivered about 4 years or 6 years sooner, respectively, than under the currently planned maximum rate. Increasing the OPC procurement rate to three or four ships per year would require a substantial increase to the Coast Guard's Procurement, Construction, and Improvements (PC&I) account,[38] an issue discussed in **Appendix B**.

Increasing the maximum procurement rate for the OPC program could, depending on the exact approach taken, reduce OPC unit acquisition costs due to improved production economies of scale. Doubling the rate for producing a given OPC design to 4 ships per year, for example, could reduce unit procurement costs for that design by as much as 10%, which could result in hundreds of millions of dollars in additional savings in acquisition costs for the program. Increasing the maximum annual procurement rate could also create new opportunities for using competition in the OPC program. Notional alternative approaches for increasing the OPC procurement rate to three or four ships per year include but are not necessarily limited to the following:

- increasing the production rate to three or four ships per year at Eastern Shipbuilding—an option that would depend on Eastern Shipbuilding's production capacity;
- introducing a second shipyard to build Eastern's design for the OPC;
- introducing a second shipyard (such as one of the other two OPC program finalists) to build its own design for the OPC—an option that would result in two OPC classes; or
- building additional NSCs in the place of some of the OPCs—an option that might include descoping equipment on those NSCs where possible to reduce their acquisition cost and make their capabilities more like that of the OPC. Such an approach would be broadly similar to how the Navy is using a descoped version of the San Antonio (LPD-17) class amphibious ship as the basis for its LPD-17 Flight II (LPD-30) class amphibious ships.[39]

[37] For further discussion, see Government Accountability Office, *Coast Guard Acquisitions[:] Actions Needed to Address Longstanding Portfolio Management Challenges*, GAO 18-454, July 2018, pp. 32-36.

[38] Prior to FY2019, the PC&I account was called the Acquisition, Construction, and Improvements (AC&I) account.

[39] For additional discussion, see CRS Report R43543, *Navy LPD-17 Flight II Amphibious Ship Program: Background and Issues for Congress*, by Ronald O'Rourke.

Impact of Hurricane Michael on OPC Program at Eastern Shipbuilding

Another potential issue for Congress concerns the impact of Hurricane Michael on Eastern Shipbuilding of Panama City, FL, the shipyard that is to build the first nine OPCs. An August 22, 2019, press released from Eastern Shipbuilding states:

> On August 16th, 2019 Eastern Shipbuilding Group, a Panama City, Florida shipyard building both government and commercial vessels, successfully delivered the tug Capt. Jim McAllister. This is the fifth vessel to be delivered by the shipyard since Hurricane Michael, a category 5 storm—which devastated the region. This delivery marks another milestone in Eastern's accelerated return to normal operations, as well as its commitment to long term sustained recovery and economic stability for the industrial base of the Florida Panhandle. Other shipbuilding projects include three Staten Island Ferries, the Coast Guard Offshore Patrol Cutters, a large commercial fishing trawler, two harbor tugs, and two river pushboats. Eastern is actively bidding other projects and is poised to maintain its position as the go to shipyard on the US Gulf. All of these projects support skilled manufacturing jobs for Northwest Florida and over twenty five other states where Eastern buys material, equipment, and specialized services.
>
> Since the hurricane, Eastern has repaired or replaced all of its impacted equipment, buildings, and shipbuilding infrastructure as part of a major company-funded recapitalization effort. Additionally, Eastern has invested in new technology aimed at increasing shipbuilding efficiency. Eastern has also partnered with State and local Governmental agencies to plan additional investments of over $45 Million towards enhancing shipbuilding efficiency and capacity in both Bay and Gulf Counties in order to ensure long term stability and growth of the shipbuilding industry in Northwest Florida.
>
> As part of its recovery and growth from a once-in-a-generation storm, Eastern is actively recruiting and hiring additional personnel to join its team and support its long term commitment to building the best vessels for its government and commercial customers. Eastern remains grateful for the unwavering Federal, State, and local support during this recovery—empowering a devastated area by providing manufacturing and industrial employment opportunities.[40]

A July 31, 2019, press report states:

> A bill needed to continue a long-awaited multi-billion-dollar Coast Guard shipbuilding project in Panama City sailed through a U.S. Senate committee on Wednesday [July 31].
>
> The bill, which received bipartisan support in the Senate Committee on Commerce, Science and Transportation, would let the Coast Guard renegotiate its $10.5 billion contract with Eastern Shipbuilding Group to account for higher labor costs and shortages caused by Hurricane Michael. The bill should help the project get back on track after the hurricane to create hundreds of new jobs that are needed more than ever as the area still recovers from the Category 5 storm, some officials say.
>
> According to a Wednesday news release, the committee approved U.S. Sen. Marco Rubio's Restore Coast Guard Capabilities Act [S. 2319] as part of the Coast Guard Reauthorization Act of 2019. Rubio's bill would give the Coast Guard the authority to renegotiate the contract with Eastern Shipbuilding to construct the first series of up to 25 offshore patrol cutters. Without a way to renegotiate the contract, the project could be delayed by years, Rubio's office warned.

[40] Eastern Shipbuilding, "Eastern Shipbuilding Group, Inc. Successfully Delivers Fifth Vessel Since Hurricane Michael," August 22, 2019.

> The Coast Guard requested the authority to renegotiate, while not exceeding the original affordability requirement set forth by the government in the existing contract, because of skyrocketing labor costs caused by the hurricane.
>
> The historic storm, which hit the Panhandle on Oct. 10, significantly damaged Tyndall Air Force Base. The press release states that the labor needed to rebuild the base is competing directly with the labor required to fulfill Eastern Shipbuilding's contract.[41]

A May 22, 2019, press report states

> A Category 5 hurricane that battered Florida's panhandle region last fall, including shipbuilder Eastern Shipbuilding Group, will impact the new medium-endurance cutter ship the company is building for the Coast Guard but at the moment it's unclear what the effects will be on cost and schedule, Coast Guard Commandant Adm. Karl Schultz said on Tuesday [May 21].

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[41] Patrick McCreless, "Bill Passes Committee to Renogotiate Panama City Coast Guard Shipbuilding Contract," *Panama City News Herald*, July 31, 2019. The press release mentioned in the article, dated July 31, 2019, states:

> Today, U.S. Senator Marco Rubio (R-FL) applauded the Senate Committee on Commerce, Science, and Transportation's approval of his Restore Coast Guard Capabilities Act (S.2319) as part of the Coast Guard Reauthorization Act of 2019 (S. 2297). Rubio's bill would give the U.S. Coast Guard the authority to take into account the impacts of Hurricane Michael to modify its Offshore Patrol Cutter (OPC) contract with Panama City-based Eastern Shipbuilding.
>
> On October 10, 2018, Hurricane Michael wreaked havoc in Northwest Florida, and made history as one of only four category 5 hurricanes to make landfall on the U.S. mainland. The Coast Guard has requested this authority that would provide much needed flexibility to modify the OPC contract, while not exceeding the original affordability requirement set forth by the government in the existing contract, as a result of skyrocketing labor costs due to Hurricane Michael. The Coast Guard maintains that acquisition of the OPC is its highest investment priority.
>
> "Continuing authorizations for the Coast Guard to protect Florida's waterways and our nation's homeland security is imperative," Rubio said. "I applaud the Senate Commerce Committee on approving this larger reauthorization, which includes several of my joint priorities that are critical to the Coast Guard's mission readiness. As a result of my partnership with Senator Scott, the bill now includes our Restore Coast Guard Capabilities Act, which will ensure the Coast Guard has the tools necessary to safeguard the Offshore Patrol Cutter even after the devastation caused by Hurricane Michael."
>
> Today, the Senate Committee on Commerce, Science and Transportation approved the Coast Guard Reauthorization Act of 2019 (S. 2297), which included several Rubio priorities:
>
> - The Restore Coast Guard Capabilities Act (S. 2319), adopted as an amendment offered by Senator Scott
> - Section 426: Coast Guard Shore Infrastructure Improvement Act
> - Section 221: Continuation of Coast Guard pay during lapse in appropriations. Senator Rubio is a cosponsor of the Pay Our Coast Guard Act (S. 21)
>
> Background:
>
> Eastern Shipbuilding is under contract with the Coast Guard to deliver up to 25 OPCs, the Coast Guard's highest priority investment program. However, Hurricane Michael significantly damaged Tyndall Air Force Base and the labor needed to rebuild the base is competing directly with the labor to fulfill the OPC contract. As a result, the Coast Guard has requested authorization from Congress to potentially revisit the contract to take into account the increased labor costs associated with the category 5 hurricane.
>
> ("Rubio Applauds Commerce Committee Passage of the Restore Coast Guard Capabilities Act to Build Offshore Patrol Cutters," July 31, 2019, accessed September 10, 2019, at: https://www.rubio.senate.gov/public/index.cfm/press-releases?ID=52E5D8E4-2559-4F67-AFBD-D70EE38FC7A5)

> Eastern Shipbuilding's analysis of Hurricane Michael's impact on the Offshore Patrol Cutter (OPC) is due to the Coast Guard by May 31, and from there the service expects to have an understanding on the way forward with the program before the end of June, Schultz said in response to questions from Rep. Garret Graves (R-La.), during a hearing hosted by the House Transportation and Infrastructure Coast Guard and Maritime Transportation Subcommittee. He said Eastern Shipbuilding will provide "perspectives" on the cost and schedule and any other impacts.
>
> "It's safe to say that we understand the impacts of a Category 5 hurricane on Eastern Shipbuilding Group will have an impact on the OPC program," Shultz said. He expects there to be some "puts and takes" after Eastern Shipbuilding submits its analysis.
>
> Rep. Peter DeFazio (D-Ore.), citing a press report earlier in the hearing, said that Sen. Marco Rubio (R-Fla.) has inserted language in a draft disaster assistance bill allowing the Coast Guard and Eastern Shipbuilding to renegotiate the firm fixed-price contract the shipbuilder is working under for the OPC to account for damage to shore side facilities from Hurricane Michael and increased labor costs.
>
> DeFazio said he is skeptical of the company's claim, noting, "I'm pretty sure they had insurance," and adding that "I question whether or not this has something to do with their original bid, which some thought was low." He also said he has concerns that a former Coast Guard Commandant that works for Eastern Shipbuilding has said he'll have authority to negotiate with his former service.
>
> Retired Adm. Robert Papp, the 24th commandant of the Coast Guard, runs Eastern Shipbuilding's Washington, D.C., operations.
>
> Eastern Shipbuilding did not respond to a query from Defense Daily about impacts to the OPC program from Hurricane Michael and any relief it may need from the current contract.
>
> Schultz said that the OPC contract can't be renegotiated without legislative authorities from Congress. He said the Coast Guard, in response to an "ask" from Congress, provided language to help with drafting the proposed legislation related to the OPC in the disaster bill.
>
> Schultz also said that the Coast Guard is not involved in Eastern Shipbuilding's lobbying efforts with Congress.[42]

A May 17, 2019, press report stated:

> As the Senate continues to negotiate the particulars of the supplemental disaster relief bill that seems poised to go to a vote next week, a new provision to save something many likely didn't know was at risk has been added.
>
> A new line in the draft bill will let Eastern Shipbuilding Group renegotiate its contract with the U.S. Coast Guard to build up to 25 new off-shore patrol cutters.
>
> "Under the old contract we were prohibited from negotiating for additional money for increased costs," said Admiral Bob Papp, President of Washington Operations for Eastern.
>
> That meant that after Hurricane Michael, they would be unable to negotiate with the Coast Guard to help cover a slew of new costs associated with both the project and the hurricane, such as the damage from the Category 5 storm that needed repairs, the prolonged schedule and the "skyrocketing" costs of labor, Papp said. The contract—the largest in the Coast Guard's history at more than $10 billion—didn't account for a natural disaster.

[42] Calvin Biesecker, "Coast Guard Expects Impact To OPC Program From Hurricane Michael, Commandant Says," *Defense Daily*, May 22, 2019.

> It was going to be hard, Papp said, for Eastern to complete the project and to "stay healthy" without some negotiations. At stake in the community are 900 planned jobs and up to 5,000 indirect jobs officials believe will help jump-start the region's manufacturing economy.
>
> But an official in Sen. Marco Rubio's office said the latest version of the supplemental disaster relief bill now includes a provision that will allow negotiations.
>
> Rubio, according to the official, spoke with the President Donald Trump on Air Force One following the president's rally in Panama City Beach last week, helping to secure the language that made it into the bill.
>
> "We've waited far too long (for disaster relief), and we're also involved in some Florida-specific issues," Rubio said in a recent video. "For example, the Hurricane had an impact on a very important Coast Guard project that's in Northwest Florida and we want to make sure that project stays on target and continues to feed jobs because Northwest Florida desperately needs those jobs to recover. We're very hopeful. Cautiously optimistic, that next week can be a very good week."
>
> Papp thanked the area's congressional delegation for stepping up to advocate for this project, saying the company is "honored and delighted" to receive help.[43]

A January 28, 2019, press release from Eastern Shipbuilding stated:

> Panama City, FL, Eastern Shipbuilding Group [ESG] reports that steel cutting for the first offshore patrol cutter (OPC), Coast Guard Cutter ARGUS (WMSM-915), commenced on January 7, 2019 at Eastern's facilities. ESG successfully achieved this milestone even with sustaining damage and work interruption due to Hurricane Michael. The cutting of steel will start the fabrication and assembly of the cutter's hull, and ESG is to complete keel laying of ARGUS later this year. Additionally, ESG completed the placement of orders for all long lead time materials for OPC #2, Coast Guard Cutter CHASE (WMSM-916).
>
> Eastern's President Mr. Joey D'Isernia noted the following: "Today represents a monumental day and reflects the dedication of our workforce - the ability to overcome and perform even under the most strenuous circumstances and impacts of Hurricane Michael. ESG families have been dramatically impacted by the storm, and we continue to recover and help rebuild our shipyard and community. I cannot overstate enough how appreciative we are of all of our subcontractors and vendors contributions to our families during the recovery as well as the support we have received from our community partners. Hurricane Michael may have left its marks but it only strengthened our resolve to build the most sophisticated, highly capable national assets for the Coast Guard. Today's success is just the beginning of the construction of the OPCs at ESG by our dedicated team of shipbuilders and subcontractors for our customer and partner, the United States Coast Guard. We are excited for what will be a great 2019 for Eastern Shipbuilding Group and Bay County, Florida."[44]

A November 1, 2018, statement from Eastern Shipbuilding states that the firm

> resumed operations at both of its two main shipbuilding facilities just two weeks after Hurricane Michael devastated Panama City Florida and the surrounding communities….
>
> … the majority of ESG's [Eastern Shipbuilding Group's] workforce has returned to work very quickly despite the damage caused by the storm. "Our employees are a resourceful and resilient group of individuals with the drive to succeed in the face of adversity. This has certainly been proven by their ability to bounce back over the two weeks following the

[43] Katie Landeck, "Provision Added to Disaster Relief Bill to Help Eastern Shipbuilding," *Panama City News Herald*, May 17, 2019.

[44] Eastern Shipbuilding press release entitled "Eastern Shipbuilding Group Announces Commencement of Steel Cutting for USCGC ARGUS (WMSM-915)," January 28, 2019, p. 1.

> storm. Our employees have returned to work much faster than anticipated and brought with them an unbreakable spirit, that I believe sets this shipyard and our community apart" said [Eastern Shipbuilding] President Joey D'Isernia. "Today, our staffing levels exceed 80% of our pre-Hurricane Michael levels and is rising daily."
>
> Immediately following the storm, ESG set out on an aggressive initiative to locate all of its employees and help get them back on the job as soon as practical after they took necessary time to secure the safety and security of their family and home. Together with its network of friends, partners, and customers in the maritime community, ESG organized daily distribution of meals and goods to employees in need. Additionally, ESG created an interest free deferred payback loan program for those employees in need and has organized Go Fund Me account to help those employees hardest hit by the storm. ESG also knew temporary housing was going to be a necessity in the short term and immediately built a small community located on greenfield space near its facilities for those employees with temporary housing needs.
>
> ESG has worked closely with its federal, state and commercial partners over the past two weeks to provide updates on the shipyard as well as on projects currently under construction. Power was restored to ESG's Nelson Facility on 10-21-18 and at ESG's Allanton Facility on 10-24-18 and production of vessels under contract is ramping back up. Additionally, all of the ESG personnel currently working on the US Coast Guard's Offshore Patrol Cutter contract have returned to work….
>
> "We are grateful to our partners and the maritime business community as a whole for their support and confidence during the aftermath of this historic storm. Seeing our incredible employees get back to building ships last week was an inspiration," said D'Isernia. "While there is no doubt that the effects of Hurricane Michael will linger with our community for years to come, I can say without reservation that we are open for business and excited about delivering quality vessels to our loyal customers."[45]

An October 22, 2018, press report states the following:

> U.S. Coast Guard officials and Eastern Shipbuilding Group are still assessing the damage caused by deadly category 4 Hurricane Michael to the Panama City, Fla.-based yard contracted to build the new class of Offshore Patrol Cutters.
>
> On September 28, the Coast Guard awarded Eastern Shipbuilding a contract to build the future USCGC *Argus* (WMSM-915), the first offshore patrol cutter (OPC). The yard was also set to build a second OPC, the future USCGC *Chase* (WMSM-916). Eastern Shipbuilding's contract is for nine OPCs, with options for two additional cutters. Ultimately, the Coast Guard plans to buy 25 OPCs.
>
> However, just as the yard was preparing to build *Argus*, Hurricane Michael struck the Florida Panhandle near Panama City on October 10. Workers from the shipyard and Coast Guard project managers evacuated and are just now returning to assess damage to the yard facilities, Brian Olexy, communications manager for the Coast Guard's Acquisitions Directorate, told USNI News.
>
> "Right now we haven't made any decisions yet on shifts in schedule," Olexy said….
>
> Since the yard was just the beginning stages of building *Argus*, Olexy said the hull wasn't damaged. "No steel had been cut," he said.
>
> Eastern Shipbuilding is still in the process of assessing damage to the yard and trying to reach its workforce. Many employees evacuated the area and have not returned, or are in

[45] Eastern Shipbuilding news release, November 1, 2018, entitled "Eastern Shipbuilding Group, Inc. Resumes Operations."

> the area but lost their homes, Eastern Shipbuilding spokesman Justin Smith told USNI News.
>
> At first, about 200 workers returned to work, but by week's end about 500 were at the yard, Smith said. The company is providing meals, water, and ice for its workforce.
>
> "Although we were significantly impacted by this catastrophic weather event, we are making great strides each day thanks to the strength and resiliency of our employees," Joey D'Isernia, president of Eastern Shipbuilding, said in a statement.[46]

Planned NSC, OPC, and FRC Procurement Quantities

Another issue for Congress concerns the Coast Guard's planned NSC, OPC, and FRC procurement quantities. The POR's planned force of 91 NSCs, OPCs, and FRCs is about equal in number to the Coast Guard's legacy force of 90 high-endurance cutters, medium-endurance cutters, and 110-foot patrol craft. NSCs, OPCs, and FRCs, moreover, are to be individually more capable than the older ships they are to replace. Even so, a Coast Guard analysis conducted in 2011 (the most recent such analysis that the Coast Guard has released) concluded that the planned total of 91 NSCs, OPCs, and FRCs would provide 61% of the cutters that would be needed to fully perform the service's statutory missions in coming years, in part because Coast Guard mission demands are expected to be greater in coming years than they were in the past. For further discussion of this issue, about which CRS has testified and reported on since 2005,[47] see **Appendix A**.

Legislative Activity in 2019

Summary of Appropriations Action on FY2020 Acquisition Funding Request

Table 2 summarizes appropriations action on the Coast Guard's request for FY2020 acquisition funding for the NSC, OPC, and FRC programs.

Table 2. Summary of Appropriations Action on FY2020 Acquisition Funding Request

Figures in millions of dollars, rounded to nearest tenth

Request	Request	HAC	SAC	Final
NSC program	60	160.5		
OPC program	457	457		
FRC program	140	290		
TOTAL	**657**	**907.5**		

Source: Table prepared by CRS based on Coast Guard's FY2020 budget submission, HAC committee report, and SAC chairman's mark and explanatory statement on FY2020 DHS Appropriations Act. **HAC** is House Appropriations Committee; **SAC** is Senate Appropriations Committee.

[46] Ben Werner, "Coast Guard, Shipbuilder Assessing Hurricane Damage to Yard Building Offshore Patrol Cutter," *USNI News*, October 22, 2018. See also Paul McLeary, "Hurricane Michael Hits Coast Guard's Largest Program, Leaving Devastation," *Breaking Defense*, October 18, 2018; Marex, "Despite Hurricane Michael, Eastern Shipbuilding Keeps Working," *Maritime Executive*, October 16, 2018; Samuel Hill, "Eastern Shipbuilding Hit Hard by Hurricane Michael," *Workboat*, October 16, 2018.

[47] See Statement of Ronald O'Rourke, Specialist in National Defense, Congressional Research Service, Before the Senate Commerce, Science, and Transportation Committee, Subcommittee on Fisheries and the Coast Guard, Hearing on The Coast Guard's Revised Deepwater Implementation Plan, June 21, 2005, pp. 1-5.

FY2020 DHS Appropriations Act (H.R. 3931)

House

The House Appropriations Committee, in its report (H.Rept. 116-180 of July 24, 2019) on H.R. 3931, recommended the funding levels shown in the HAC column of **Table 2**.

H.Rept. 116-180 states:

> *National Security Cutter (NSC).*—Although the original program of record for procuring NSCs included only eight vessels, Congress has funded eleven NSCs to-date. The Committee is aware of the potential requirement for one additional NSC as the Coast Guard reassesses its fleet requirements, and that the discontinuation of the NSC production line could result in increased production costs in the future if the Coast Guard ultimately determines that a twelfth NSC is required. In order to preserve the option of procuring an additional NSC while the Coast Guard evaluates its future needs, the recommendation includes an increase above the request of $100,500,000 for the NSC program, an amount sufficient to procure long lead time materials for a twelfth NSC if the Coast Guard determines it is needed. (Page 43)

The committee's draft report also states

> *Fast Response Cutter (FRC).*—The recommendation provides $290,000,000 for five FRCs, $150,000,000 above the request. (Page 43)

The committee's draft report also states

> *Asset Acquisition Report.*—The Commandant is directed to provide to the Committee, not later than one year after the date of enactment of this Act, a report that examines the number and type of Coast Guard assets required to meet the Service's current and foreseeable needs in accordance with its statutory missions. The report shall include, but not be limited to, an assessment of the required number and types of cutters and aircraft for current and planned asset acquisitions. The report shall also specifically address regional mission requirements in the Western Hemisphere, including the Polar regions; support provided to Combatant Commanders; and trends in illicit activity and illegal migration. (Page 41)

Coast Guard Authorization Act of 2019 (S. 2297)

Senate

On July 31, 2019, the Senate Commerce, Science, and Transportation Committee ordered S. 2297 to be reported with an amendment favorably. In S. 2297 as introduced on July 25, 2019 (the only version of S. 2297 posted at Congress.gov as of September 10, 2019), **Section 104** states

> SEC. 104. Availability of amounts for acquisition of additional National Security Cutter.
>
> (a) In general.—Of the aggregate amount authorized to be appropriated for fiscal years 2020 and 2021 by section 4902(2) of title 14, United States Code, as amended by section 101 of this Act, $650,000,000 is authorized to be available for the acquisition of a National Security Cutter.
>
> (b) Treatment of acquired Cutter.—Any Cutter acquired using amounts available pursuant to subsection (a) shall be in addition to the National Security Cutters approved under the existing acquisition baseline in the program of record for the National Security Cutter.

Section 403 of S. 2297 as introduced states (emphasis added):

> SEC. 403. Unmanned maritime systems.

(a) Assessment.—

(1) IN GENERAL.—The Commandant shall regularly assess available unmanned maritime systems for potential use to support missions of the Coast Guard.

(2) CONSULTATION.—The Commandant shall make the assessment required under paragraph (1) after consultation with the Department of Defense, other Federal agencies, the academic sector, and developers and manufacturers of unmanned maritime systems.

(b) Report.—

(1) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, and biennially thereafter, the Commandant shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report on the actual and potential effects of the use of available unmanned maritime systems on the mission effectiveness of the Coast Guard.

(2) CONTENTS.—Each report submitted under paragraph (1) shall include the following:

(A) An inventory of available unmanned maritime systems used by the Coast Guard, an overview of such usage, and a discussion of the mission effectiveness of such systems, including any benefits realized or risks or negative aspects of such usage.

(B) A prioritized list of Coast Guard mission requirements that could be met with additional unmanned maritime systems, and the estimated costs of acquiring and operating such systems. This list should take into consideration interoperability with the current and future fleet of **National Security Cutters**, **Fast Response Cutters**, **Offshore Patrol Cutters**, Polar Security Cutters, and in-service legacy cutters such as the 270-foot, 210-foot, and 225-foot Buoy Tenders.

(c) Definitions.—In this section:

(1) UNMANNED MARITIME SYSTEM.—

(A) IN GENERAL.—The term "unmanned maritime system" means a remotely operated or autonomous vehicle that—

(i) is produced by the commercial sector;

(ii) is designed to travel in the air, on or under the ocean surface, on land, or any combination thereof; and

(iii) functions without an on-board human presence.

(B) INCLUSIONS.—The term "unmanned maritime system" includes—

(i) associated components, such as control and communications, data transmission, and processing systems;

(ii) an unmanned undersea vehicle;

(iii) an unmanned surface vehicle;

(iv) an unmanned aerial vehicle;

(v) an autonomous underwater vehicle;

(vi) an autonomous surface vehicle; and

(vii) an autonomous aerial vehicle.

(2) AVAILABLE UNMANNED MARITIME SYSTEMS.—The term "available unmanned maritime systems" includes unmanned maritime systems that can be purchased commercially or are available to the Coast Guard in coordination with the Department of Defense or other Federal agency.

Restore Coast Guard Capabilities Act (S. 2319)

Senate

S. 2319 was introduced in the Senate on July 30, 2019. The text of S. 2319 is as follows:

> Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,
>
> SECTION 1. Short title.
>
> This Act may be cited as the "Restore Coast Guard Capabilities Act".
>
> SEC. 2. Modifications to contracts for offshore patrol cutters permitted based on impacts of Hurricane Michael.
>
> Notwithstanding Public Law 85–804,[48] the United States Coast Guard is authorized to take into account the impacts of Hurricane Michael for the purpose of modifying, without consideration, but not exceeding the original affordability requirement as set forth in section C of the existing contract to construct Offshore Patrol Cutters upon a determination that doing so would facilitate national security.

[48] P.L. 85-804 of August 28, 1958 (50 U.S.C. 1431 et seq.), a law regarding the provision of extraordinary contractual relief to government contractors performing work related to national defense, grants the president authority, subject to certain limitations and conditions, to "authorize any department or agency of the Government which exercises functions in connection with the national defense, acting in accordance with regulations prescribed by the President for the protection of the Government, to enter into contracts or into amendments or modifications of contracts heretofore or hereafter made and to make advance payments thereon, without regard to other provisions of law relating to the making, performance, amendment, or modification of contracts, whenever he deems that such action would facilitate the national defense." (50 U.S.C. 1431) The text of P.L. 85-804 is posted at https://www.govinfo.gov/content/pkg/STATUTE-72/pdf/STATUTE-72-Pg972.pdf. For a summary of P.L. 85-804, see Brennan Center for Justice, "Presidential Power: Public Law 85-804 (50 U.S.C. §§ 1431-35)," undated, accessed September 10, 2019, at https://www.brennancenter.org/sites/default/files/analysis/50%20USC%201431-1435.pdf. Although it is undated, it appears to have been written no earlier than 2014, as it includes three references to the year 2014, including one that states: "As of 2014…." For additional historical and other background information on P.L. 85-804, see CRS Report 76-261, *Extraordinary Contractual Relief Under Public Law 85-804*, April 28, 1976, by Andrew C. Mayer. The report was prepared at the request of the House Armed Services Committee, which converted the report into a committee print dated May 10, 1976, that is posted at https://ufdc.ufl.edu/AA00022546/00001/1j.

Appendix A. Planned NSC, OPC, and FRC Procurement Quantities

This appendix provides further discussion on the issue of the Coast Guard's planned NSC, OPC, and FRC procurement quantities.

Overview

The Coast Guard's program of record for NSCs, OPCs, and FRCs includes only about 61% as many cutters as the Coast Guard calculated in 2011 would be needed to fully perform its projected future missions. (The Coast Guard's 2011 analysis is the most recent such analysis that the Coast Guard has released.) The Coast Guard's planned force levels for NSCs, OPCs, and FRCs have remained unchanged since 2004. In contrast, the Navy since 2004 has adjusted its ship force-level goals multiple times in response to changing strategic and budgetary circumstances.[49]

Although the Coast Guard's strategic situation and resulting mission demands may not have changed as much as the Navy's have since 2004, the Coast Guard's budgetary circumstances may have changed since 2004. The 2004 program of record was heavily conditioned by Coast Guard expectations in 2004 about future funding levels in the PC&I account. Those expectations may now be different, as suggested by the willingness of Coast Guard officials in 2017 to begin regularly mentioning the need for an PC&I funding level of $2 billion per year (see **Appendix B**).

It can also be noted that continuing to, in effect, use the Coast Guard's 2004 expectations of future funding levels for the PC&I account as an implicit constraint on planned force levels for NSCs, OPCs, and FRCs can encourage an artificially narrow view of Congress's options regarding future Coast Guard force levels and associated funding levels, depriving Congress of agency in the exercise of its constitutional power to provide for the common defense and general welfare of the United States, and to set funding levels and determine the composition of federal spending.

2009 Coast Guard Fleet Mix Analysis

The Coast Guard estimated in 2009 that with the POR's planned force of 91 NSCs, OPCs, and FRCs, the service would have capability or capacity gaps[50] in 6 of its 11 statutory missions—search and rescue (SAR); defense readiness; counterdrug operations; ports, waterways, and coastal security (PWCS); protection of living marine resources (LMR); and alien migrant interdiction operations (AMIO). The Coast Guard judges that some of these gaps would be "high risk" or "very high risk."

Public discussions of the POR frequently mention the substantial improvement that the POR force would represent over the legacy force. Only rarely, however, have these discussions explicitly acknowledged the extent to which the POR force would nevertheless be smaller in number than the force that would be required, by Coast Guard estimate, to fully perform the Coast Guard's statutory missions in coming years. Discussions that focus on the POR's

[49] See Table 1 and Table B-1 of CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke. As shown in those tables, the Navy's force-level goal of 2002-2004 was followed by new force- level goals in early 2005, February 2006, mid-2011, September 2011, March 2012, January 2013, March 2015, and December 2016.

[50] The Coast Guard uses *capability* as a qualitative term, to refer to the kinds of missions that can be performed, and *capacity* as a quantitative term, to refer to how much (i.e., to what scale or volume) a mission can be performed.

improvement over the legacy force while omitting mention of the considerably larger number of cutters that would be required, by Coast Guard estimate, to fully perform the Coast Guard's statutory missions in coming years could encourage audiences to conclude, contrary to Coast Guard estimates, that the POR's planned force of 91 cutters would be capable of fully performing the Coast Guard's statutory missions in coming years.

In a study completed in December 2009 called the Fleet Mix Analysis (FMA) Phase 1, the Coast Guard calculated the size of the force that in its view would be needed to fully perform the service's statutory missions in coming years. The study refers to this larger force as the objective fleet mix. **Table A-1** compares planned numbers of NSCs, OPCs, and FRCs in the POR to those in the objective fleet mix.

Table A-1. Program of Record Compared to Objective Fleet Mix

From Fleet Mix Analysis Phase 1 (2009)

Ship type	Program of Record (POR)	Objective Fleet Mix From FMA Phase 1	Objective Fleet Mix compared to POR	
			Number	%
NSC	8	9	+1	+13%
OPC	25	57	+32	+128%
FRC	58	91	+33	+57%
Total	**91**	**157**	**+66**	**+73%**

Source: Fleet Mix Analysis Phase 1, Executive Summary, Table ES-8 on page ES-13.

As can be seen in **Table A-1**, the objective fleet mix includes 66 additional cutters, or about 73% more cutters than in the POR. Stated the other way around, the POR includes about 58% as many cutters as the 2009 FMA Phase I objective fleet mix.

As intermediate steps between the POR force and the objective fleet mix, FMA Phase 1 calculated three additional forces, called FMA-1, FMA-2, and FMA-3. (The objective fleet mix was then relabeled FMA-4.) **Table A-2** compares the POR to FMAs 1 through 4.

Table A-2. POR Compared to FMAs 1 Through 4

From Fleet Mix Analysis Phase 1 (2009)

Ship type	Program of Record (POR)	FMA-1	FMA-2	FMA-3	FMA-4 (Objective Fleet Mix)
NSC	8	9	9	9	9
OPC	25	32	43	50	57
FRC	58	63	75	80	91
Total	**91**	**104**	**127**	**139**	**157**

Source: Fleet Mix Analysis Phase 1, Executive Summary, Table ES-8 on page ES-13.

FMA-1 was calculated to address the mission gaps that the Coast Guard judged to be "very high risk." FMA-2 was calculated to address both those gaps and additional gaps that the Coast Guard judged to be "high risk." FMA-3 was calculated to address all those gaps, plus gaps that the Coast Guard judged to be "medium risk." FMA-4—the objective fleet mix—was calculated to address all the foregoing gaps, plus the remaining gaps, which the Coast Guard judge to be "low risk" or

"very low risk." **Table A-3** shows the POR and FMAs 1 through 4 in terms of their mission performance gaps.

Table A-3. Force Mixes and Mission Performance Gaps

From Fleet Mix Analysis Phase 1 (2009)—an X mark indicates a mission performance gap

Missions with performance gaps	Risk levels of these performance gaps	Program of Record (POR)	FMA-1	FMA-2	FMA-3	FMA-4 (Objective Fleet Mix)
Search and Rescue (SAR) capability	Very high	X				
Defense Readiness capacity	Very high	X				
Counter Drug capacity	Very high	X				
Ports, Waterways, and Coastal Security (PWCS) capacity[a]	High	X	X			
Living Marine Resources (LMR) capability and capacity[a]	High	X	X			[all gaps addressed]
PWCS capacity[b]	Medium	X	X	X		
LMR capacity[c]	Medium	X	X	X		
Alien Migrant Interdiction Operations (AMIO) capacity[d]	Low/very low	X	X	X	X	
PWCS capacity[e]	Low/very low	X	X	X	X	

Source: Fleet Mix Analysis Phase 1, Executive Summary, page ES-11 through ES-13.

Notes: In the first column, The Coast Guard uses *capability* as a qualitative term, to refer to the kinds of missions that can be performed, and *capacity* as a quantitative term, to refer to how much (i.e., to what scale or volume) a mission can be performed.

a. This gap occurs in the Southeast operating area (Coast Guard Districts 7 and 8) and the Western operating area (Districts 11, 13, and 14).

b. This gap occurs in Alaska.

c. This gap occurs in Alaska and in the Northeast operating area (Districts 1 and 5).

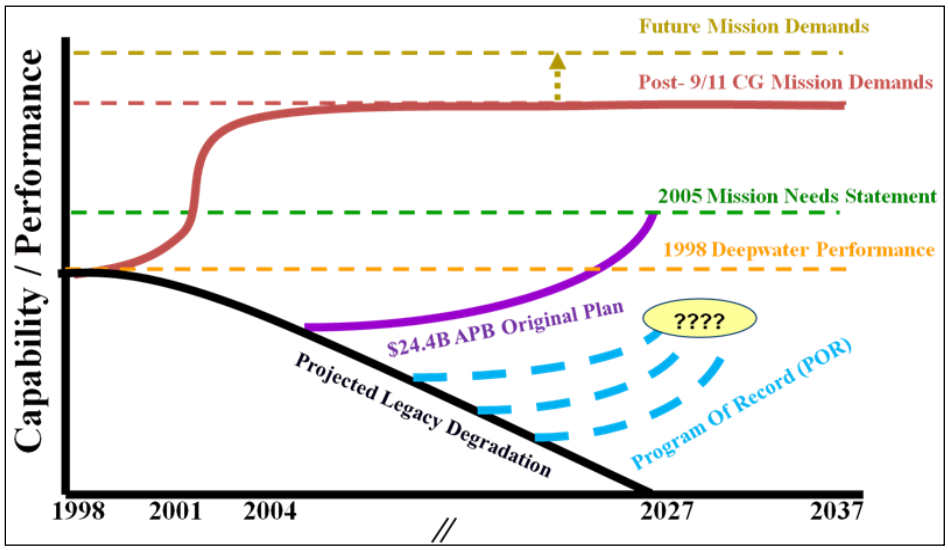
d. This gap occurs in the Southeast and Western operating areas.

e. This gap occurs in the Northeast operating area.

Figure A-1, taken from FMA Phase 1, depicts the overall mission capability/performance gap situation in graphic form. It appears to be conceptual rather than drawn to precise scale. The black line descending toward 0 by the year 2027 shows the declining capability and performance of the Coast Guard's legacy assets as they gradually age out of the force. The purple line branching up from the black line shows the added capability from ships and aircraft to be procured under the POR, including the 91 planned NSCs, OPCs, and FRCs. The level of capability to be provided when the POR force is fully in place is the green line, labeled "2005 Mission Needs Statement." As can be seen in the graph, this level of capability is substantially below a projection of Coast Guard mission demands made after the terrorist attacks of September 11, 2001 (the red line, labeled "Post-9/11 CG Mission Demands"), and even further below a Coast Guard projection of future mission demands (the top dashed line, labeled "Future Mission Demands"). The dashed blue lines show future capability levels that would result from reducing planned procurement quantities in the POR or executing the POR over a longer time period than originally planned.

Figure A-1. Projected Mission Demands vs. Projected Capability/Performance

From Fleet Mix Analysis Phase 1, Executive Summary



Source: Fleet Mix Analysis Phase 1, Executive Summary, Figure ES-1 on p. ES-2.

FMA Phase 1 was a fiscally unconstrained study, meaning that the larger force mixes shown in **Table A-2** were calculated primarily on the basis of their capability for performing missions, rather than their potential acquisition or life-cycle operation and support (O&S) costs.

Although the FMA Phase 1 was completed in December 2009, the figures shown in **Table A-2** were generally not included in public discussions of the Coast Guard's future force structure needs until April 2011, when GAO presented them in testimony.[51] GAO again presented them in a July 2011 report.[52]

The Coast Guard completed a follow-on study, called Fleet Mix Analysis (FMA) Phase 2, in May 2011. Among other things, FMA Phase 2 includes a revised and updated objective fleet mix called the refined objective mix. **Table A-4** compares the POR to the objective fleet mix from FMA Phase 1 and the refined objective mix from FMA Phase 2.

As can be seen in **Table A-4**, compared to the objective fleet mix from FMA Phase 1, the refined objective mix from FMA Phase 2 includes 49 OPCs rather than 57. The refined objective mix includes 58 additional cutters, or about 64% more cutters than in the POR. Stated the other way around, the POR includes about 61% as many cutters as the refined objective mix.

[51] Government Accountability Office, *Coast Guard[:]Observations on Acquisition Management and Efforts to Reassess the Deepwater Program, Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives, Statement of John P. Hutton, Director Acquisition and Sourcing Management*, GAO-11-535T, April 13, 2011, p. 10.

[52] Government Accountability Office, *Coast Guard[:]Action Needed As Approved Deepwater Program Remains Unachievable*, GAO-11-743, July 2011, p. 46.

Table A-4. POR Compared to Objective Mixes in FMA Phases 1 and 2

From Fleet Mix Analysis Phase 1 (2009) and Phase 2 (2011)

Ship type	Program of Record (POR)	Objective Fleet Mix from FMA Phase 1	Refined Objective Mix from FMA Phase 2
NSC	8	9	9
OPC	25	57	49
FRC	58	91	91
Total	**91**	**157**	**149**

Source: Fleet Mix Analysis Phase 1, Executive Summary, Table ES-8 on page ES-13, and Fleet Mix Analysis Phase 2, Table ES-2 on p. iv.

Compared to the POR, the larger force mixes shown in **Table A-2** and **Table A-4** would be more expensive to procure, operate, and support than the POR force. Using the average NSC, OPC, and FRC procurement cost figures presented earlier (see "Background"), procuring the 58 additional cutters in the Refined Objective Mix from FMA Phase 2 might cost an additional $10.7 billion, of which most (about $7.8 billion) would be for the 24 additional FRCs. (The actual cost would depend on numerous factors, such as annual procurement rates.) O&S costs for these 58 additional cutters over their life cycles (including crew costs and periodic ship maintenance costs) would require billions of additional dollars.[53]

The larger force mixes in the FMA Phase 1 and 2 studies, moreover, include not only increased numbers of cutters, but also increased numbers of Coast Guard aircraft. In the FMA Phase 1 study, for example, the objective fleet mix included 479 aircraft—93% more than the 248 aircraft in the POR mix. Stated the other way around, the POR includes about 52% as many aircraft as the objective fleet mix. A decision to procure larger numbers of cutters like those shown in **Table A-2** and **Table A-4** might thus also imply a decision to procure, operate, and support larger numbers of Coast Guard aircraft, which would require billions of additional dollars. The FMA Phase 1 study estimated the procurement cost of the objective fleet mix of 157 cutters and 479 aircraft at $61 billion to $67 billion in constant FY2009 dollars, or about 66% more than the procurement cost of $37 billion to $40 billion in constant FY2009 dollars estimated for the POR mix of 91 cutters and 248 aircraft. The study estimated the total ownership cost (i.e., procurement plus life-cycle O&S cost) of the objective fleet mix of cutters and aircraft at $201 billion to $208 billion in constant FY2009 dollars, or about 53% more than the total ownership cost of $132 billion to $136 billion in constant FY2009 dollars estimated for POR mix of cutters and aircraft.[54]

A December 7, 2015, press report states the following:

> The Coast Guard's No. 2 officer said the small size and advanced age of its fleet is limiting the service's ability to carry out crucial missions in the Arctic and drug transit zones or to meet rising calls for presence in the volatile South China Sea.

[53] The FMA Phase 1 and Phase 2 studies present acquisition and life-cycle ownership cost calculations for force mixes that include not only larger numbers of NSC, OPCs, and FRCs, but corresponding larger numbers of Coast Guard aircraft.

[54] Fleet Mix Analysis Phase 1, Executive Summary, Table ES-11 on page ES-19, and Table ES-10 on page ES-18. The life-cycle O&S cost was calculated through 2050.

> "The lack of surface vessels every day just breaks my heart," VADM Charles Michel, the Coast Guard's vice commandant, said Dec. 7.
>
> Addressing a forum on American Sea Power sponsored by the U.S. Naval Institute at the Newseum, Michel detailed the problems the Coast Guard faces in trying to carry out its missions of national security, law enforcement and maritime safety because of a lack of resources.
>
> "That's why you hear me clamoring for recapitalization," he said.
>
> Michel noted that China's coast guard has a lot more ships than the U.S. Coast Guard has, including many that are larger than the biggest U.S. cutter, the 1,800-ton [sic:4,800-ton] National Security Cutter. China is using those white-painted vessels rather than "gray-hull navy" ships to enforce its claims to vast areas of the South China Sea, including reefs and shoals claimed by other nations, he said.
>
> That is a statement that the disputed areas are "so much our territory, we don't need the navy. That's an absolutely masterful use of the coast guard," he said.
>
> The superior numbers of Chinese coast guard vessels and its plans to build more is something, "we have to consider when looking at what we can do in the South China Sea," Michel said.
>
> Although they have received requests from the U.S. commanders in the region for U.S. Coast Guard cutters in the South China Sea, "the commandant had to say 'no'. There's not enough to go around," he said.[55]

Potential oversight questions for Congress include the following:

- Under the POR force mix, how large a performance gap, precisely, would there be in each of the missions shown in **Table A-3**? What impact would these performance gaps have on public safety, national security, and protection of living marine resources?
- How sensitive are these performance gaps to the way in which the Coast Guard translates its statutory missions into more precise statements of required mission performance?
- Given the performance gaps shown in **Table A-3**, should planned numbers of Coast Guard cutters and aircraft be increased, or should the Coast Guard's statutory missions be reduced, or both?
- How much larger would the performance gaps in **Table A-3** be if planned numbers of Coast Guard cutters and aircraft are reduced below the POR figures?
- Has the executive branch made sufficiently clear to Congress the difference between the number of ships and aircraft in the POR force and the number that would be needed to fully perform the Coast Guard's statutory missions in coming years? Why has public discussion of the POR focused mostly on the capability improvement it would produce over the legacy force and rarely on the performance gaps it would have in the missions shown in **Table A-3**?

[55] Otto Kreisher, "'Not Enough' USCG Vessels to Meet Demand for Presence in South China Sea, Arctic," *Seapower*, December 7, 2015.

- What projected mission demands or other factors may have changed since the Coast Guard's 2011 Fleet Mix Analysis, and how might these changes affect future required numbers of Coast Guard cutters and other Coast Guard assets?[56]

[56] For a blog post discussing this issue, see Chuck Hill, "Is Our Fleet Recapitalization on Course? Do We Need to Change the Destination?" *Chuck Hill's CG Blog*, September 8, 2019.

Appendix B. Funding Levels in PC&I Account

This appendix provides background information on funding levels in the Coast Guard's Procurement, Construction, and Improvements (PC&I) account.[57]

Overview

As shown in **Table B-1**, the FY2013 budget submission programmed an average of about $1.5 billion per year in the PC&I account. As also shown in the table, the FY2014-FY2016 budget submissions reduced that figure to between $1 billion and $1.2 billion per year.

Table B-1. Funding in PC&I Account in FY2013-FY2020 Budgets

Figures in millions of dollars, rounded to nearest tenth

Budget	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	Avg.
FY13	1,217.3	1,429.5	1,619.9	1,643.8	1,722.0								1,526.5
FY14		951.1	1,195.7	901.0	1,024.8	1,030.3							1,020.6
FY15			1,084.2	1,103.0	1,128.9	1,180.4	1,228.7						1,145.0
FY16				1,017.3	1,125.3	1,255.7	1,201.0	1,294.6					1,178.8
FY17					1,136.8	1,259.6	1,339.9	1,560.5	1,840.8				1,427.5
FY18						1,203.7	1,360.9	1,602.7	1,810.6	1,687.5			1,533.1
FY19							1,886.8	1,473.0	1,679.8	1,555.5	1,698.5		1,658.7
FY20								1,234.7	n/a	n/a	n/a	n/a	n/a

Source: Table prepared by CRS based on Coast Guard FY2013-FY2020 budget submissions.

The Coast Guard has testified that funding the PC&I account at a level of about $1 billion to $1.2 billion per year would make it difficult to fund various Coast Guard acquisition projects, including a new polar icebreaker and improvements to Coast Guard shore installations. Coast Guard plans call for procuring OPCs at an eventual rate of two per year. If each OPC costs roughly $400 million, procuring two OPCs per year in a PC&I account of about $1 billion to $1.2 billion per year, as programmed under the FY2014-FY2016 budget submissions, would leave about $200 million to $400 million per year for all other PC&I-funded programs.

Since 2017, Coast Guard officials have been stating more regularly what they stated only infrequently in earlier years: that executing the Coast Guard's various acquisition programs fully and on a timely basis would require the PC&I account to be funded in coming years at a level of about $2 billion per year. Statements from Coast Guard officials on this issue in past years have sometimes put this figure as high as about $2.5 billion per year.

Using Past PC&I Funding Levels as a Guide for Future PC&I Funding Levels

In assessing future funding levels for executive branch agencies, a common practice is to assume or predict that the figure in coming years will likely be close to where it has been in previous years. While this method can be of analytical and planning value, for an agency like the Coast Guard, which goes through periods with less acquisition of major platforms and periods with

[57] Prior to FY2019, the PC&I account was called the Acquisition, Construction, and Improvements (AC&I) account.

more acquisition of major platforms, this approach might not always be the best approach, at least for the PC&I account.

More important, in relation to maintaining Congress's status as a co-equal branch of government, including the preservation and use of congressional powers and prerogatives, an analysis that assumes or predicts that future funding levels will resemble past funding levels can encourage an artificially narrow view of congressional options regarding future funding levels, depriving Congress of agency in the exercise of its constitutional power to set funding levels and determine the composition of federal spending.

Past Coast Guard Statements About Required PC&I Funding Level

At an October 4, 2011, hearing on the Coast Guard's major acquisition programs before the Coast Guard and Maritime Transportation subcommittee of the House Transportation and Infrastructure Committee, the following exchange occurred:

> REPRESENATIVE FRANK LOBIONDO:
>
> Can you give us your take on what percentage of value must be invested each year to maintain current levels of effort and to allow the Coast Guard to fully carry out its missions?
>
> ADMIRAL ROBERT J. PAPP, COMMANDANT OF THE COAST GUARD:
>
> I think I can, Mr. Chairman. Actually, in discussions and looking at our budget—and I'll give you rough numbers here, what we do now is we have to live within the constraints that we've been averaging about $1.4 billion in acquisition money each year.
>
> If you look at our complete portfolio, the things that we'd like to do, when you look at the shore infrastructure that needs to be taken care of, when you look at renovating our smaller icebreakers and other ships and aircraft that we have, we've done some rough estimates that it would really take close to about $2.5 billion a year, if we were to do all the things that we would like to do to sustain our capital plant.
>
> So I'm just like any other head of any other agency here, as that the end of the day, we're given a top line and we have to make choices and tradeoffs and basically, my tradeoffs boil down to sustaining frontline operations balancing that, we're trying to recapitalize the Coast Guard and there's where the break is and where we have to define our spending.[58]

An April 18, 2012, blog entry stated the following:

> If the Coast Guard capital expenditure budget remains unchanged at less than $1.5 billion annually in the coming years, it will result in a service in possession of only 70 percent of the assets it possesses today, said Coast Guard Rear Adm. Mark Butt.
>
> Butt, who spoke April 17 [2012] at [a] panel [discussion] during the Navy League Sea Air Space conference in National Harbor, Md., echoed Coast Guard Commandant Robert Papp in stating that the service really needs around $2.5 billion annually for procurement.[59]

At a May 9, 2012, hearing on the Coast Guard's proposed FY2013 budget before the Homeland Security subcommittee of the Senate Appropriations Committee, Admiral Papp testified, "I've

[58] Source: Transcript of hearing.

[59] David Perera, "The Coast Guard Is Shrinking," *FierceHomelandSecurity.com*, April 18, 2012, accessed July 20, 2012, at http://www.fiercehomelandsecurity.com/story/coast-guard-shrinking/2012-04-18.

gone on record saying that I think the Coast Guard needs closer to $2 billion dollars a year [in acquisition funding] to recapitalize—[to] do proper recapitalization."[60]

At a May 14, 2013, hearing on the Coast Guard's proposed FY2014 budget before the Homeland Security Subcommittee of the Senate Appropriations Committee, Admiral Papp stated the following regarding the difference between having about $1.0 billion per year rather than about $1.5 billion per year in the PC&I account:

> Well, Madam Chairman, $500 million—a half a billion dollars—is real money for the Coast Guard. So, clearly, we had $1.5 billion in the [FY]13 budget. It doesn't get everything I would like, but it—it gave us a good start, and it sustained a number of projects that are very important to us.
>
> When we go down to the $1 billion level this year, it gets my highest priorities in there, but we have to either terminate or reduce to minimum order quantities for all the other projects that we have going.
>
> If we're going to stay with our program of record, things that have been documented that we need for our service, we're going to have to just stretch everything out to the right. And when we do that, you cannot order in economic order quantities. It defers the purchase. Ship builders, aircraft companies—they have to figure in their costs, and it inevitably raises the cost when you're ordering them in smaller quantities and pushing it off to the right.
>
> Plus, it almost creates a death spiral for the Coast Guard because we are forced to sustain older assets—older ships and older aircraft—which ultimately cost us more money, so it eats into our operating funds, as well, as we try to sustain these older things.
>
> So, we'll do the best we can within the budget. And the president and the secretary have addressed my highest priorities, and we'll just continue to go on the—on an annual basis seeing what we can wedge into the budget to keep the other projects going.[61]

At a March 12, 2014, hearing on the Coast Guard's proposed FY2015 budget before the Homeland Security subcommittee of the House Appropriations Committee, Admiral Papp stated the following:

> Well, that's what we've been struggling with, as we deal with the five-year plan, the capital investment plan, is showing how we are able to do that. And it will be a challenge, particularly if it sticks at around $1 billion [per year]. As I've said publicly, and actually, I said we could probably—I've stated publicly before that we could probably construct comfortably at about 1.5 billion [dollars] a year. But if we were to take care of all the Coast Guard's projects that are out there, including shore infrastructure that that fleet that takes care of the Yemen [sic: inland] waters is approaching 50 years of age, as well, but I have

[60] Source: transcript of hearing. Papp may have been referring to remarks he made to the press before giving his annual state of the Coast Guard speech on February 23, 2012, in which reportedly stated that the Coast Guard would require about $2 billion per year in acquisition funding to fully replace its current assets. (See Adam Benson, "Coast Guard Cutbacks Will Cost 1,000 Jobs," *Norwich Bulletin*, February 23, 2012, accessed May 31, 2012, at http://www.norwichbulletin.com/x1138492141/Coast-Guard-cutbacks-will-cost-1-000-jobs. See also "Coast Guard Leader Calls For More Ships," *MilitaryFeed.com*, February 24, 2012, accessed May 31, 2012, at http://militaryfeed.com/coast-guard-leader-calls-for-more-ships-5/; Associated Press, "Coast Guard Commandant Calls for New Ships," *TheLog.com*, March 10, 2012, accessed May 31, 2012, at http://www.thelog.com/SNW/Article/Coast-Guard-Commandant-Calls-for-New-Ships-to-Replace-Aging-Fleet; Mickey McCarter, "Congress Poised to Give Coast Guard More Money Than Requested for FY 2013," *HSToday.us*, May 10, 2012, accessed May 31, 2012, at http://www.hstoday.us/focused-topics/customs-immigration/single-article-page/congress-poised-to-give-coast-guard-more-money-than-requested-for-fy-2013.html.) See also "Interview, Adm. Robert Papp, US Coast Guard Commandant," *Defense News*, November 11, 2013: 30.

[61] Transcript of hearing. The remarks were made in response to a question from Sen. Mary Landrieu.

> no replacement plan in sight for them because we simply can't afford it. Plus, we need at some point to build a polar icebreaker. Darn tough to do all that stuff when you're pushing down closer to 1 billion [dollars per year], instead of 2 billion [dollars per year].
>
> As I said, we could fit most of that in at about the 1.5 billion [dollars per year] level, but the projections don't call for that. So we are scrubbing the numbers as best we can.[62]

At a March 24, 2015, hearing on the Coast Guard's proposed FY2016 budget before the Homeland Security subcommittee of the House Appropriations Committee, Admiral Paul Zukunft, Admiral Papp's successor as Commandant of the Coast Guard, stated the following:

> I look back to better years in our acquisition budget when we had a—an acquisition budget of—of $1.5 billion. That allows me to move these programs along at a much more rapid pace and, the quicker I can build these at full-rate production, the less cost it is in the long run as well. But there's an urgent need for me to be able to deliver these platforms in a timely and also in an affordable manner. But to at least have a reliable and a predictable acquisition budget would make our work in the Coast Guard much easier. But when we see variances of—of 30, 40% over a period of three or four years, and not knowing what the Budget Control Act may have in store for us going on, yes, we are treading water now but any further reductions, and now I am—I am beyond asking for help. We are taking on water.[63]

An April 13, 2017, press report states the following (emphasis added):

> Coast Guard Commandant Adm. Paul Zukunft on Wednesday [April 12] said that for the Coast Guard to sustain its recapitalization plans and operations the service needs a $2 billion annual acquisition budget that grows modestly overtime to keep pace with inflation.
>
> The Coast Guard needs a "predictable, reliable" acquisition budget "and within that we need 5 percent annual growth to our operations and maintenance (O&M) accounts," Zukunft told reporters at a Defense Writers Group breakfast. Inflation will clip 2 to 3 percent from that, but "at 5 percent or so it puts you on a moderate but positive glide slope so you can execute, so you can build the force," he said.[64]

In an interview published on June 1, 2017, Zukunft said the following (emphasis added):

> We cannot be more relevant than we are now. But what we need is predictable funding. We have been in over 16 continuing resolutions since 2010. I need stable and repeatable funding. **An acquisition budget with a floor of $2 billion.** Our operating expenses as I said, they've been funded below the Budget Control Act floor for the past five years. I need 5 percent annualized growth over the next five years and beyond to start growing some of this capability back.
>
> But more importantly, we [need] more predictable, more reliable funding so we can execute what we need to do to carry out the business of the world's best Coast Guard.[65]

[62] Transcript of hearing.

[63] Transcript of hearing. The remarks were made in response to a question from Rep. John Culberson.

[64] Calvin Biesecker, "Zukunft Wants $2 Billion Baseline Acquisition Budget; Sustained Growth In O&M Funding," *Defense Daily*, April 13, 2017: 1.

[65] Jill Aitoro, "Interview: Adm. Paul Zukunft Demands Coast Guard Respect," *Defense News*, June 1, 2017.

Appendix C. Additional Information on Status and Execution of NSC, OPC, and FRC Programs from May 2018 GAO Report

This appendix presents additional information on the status and execution of the NSC, OPC, and FRC programs from a May 2018 GAO report reviewing DHS acquisition programs.[66]

NSC Program

Regarding the NSC program, the May 2018 GAO report states the following:

> DHS's Under Secretary for Management (USM) directed the USCG to complete follow-on operational test and evaluation (OT&E) by March 2019. According to USCG officials, the program's OTA began follow-on OT&E in October 2017, which will test unmet key performance parameters (KPP) and address deficiencies found during prior testing. The NSC completed initial operational testing in 2014, but did not fully demonstrate 7 of its 19 KPPs, including those related to unmanned aircraft and cutter-boat deployment in rough seas. According to USCG officials, operators have since demonstrated these KPPs during USCG operations. For example, USCG officials stated that they successfully demonstrated operations of a prototype unmanned aircraft on an NSC. However, the USCG will not evaluate the NSC's unmanned aircraft KPP until the unmanned aircraft undergoes initial OT&E, currently planned for June 2019. In addition, the NSC will be the first USCG asset to undergo cybersecurity testing. However, this test has been delayed over a year with the final cyber test event scheduled for August 2018 because of a change in NSC operational schedules, among other things.
>
> The DHS USM also directed the USCG to complete a study to determine the root cause of the NSC's propulsion system issues by December 2017; however, as of January 2018, the study was not yet complete. GAO previously reported on these issues—including high engine temperatures, cracked cylinder heads, and overheating generator bearings that were impacting missions—in January 2016....
>
> The USCG initially planned to implement a crew rotational concept in which crews would rotate while NSCs were underway to achieve a goal of 230 days away from the cutter's homeport. In February 2018, USCG officials told GAO they abandoned the crew rotational concept because the concept did not provide the USCG with the expected return on investment. Instead, USCG officials said a new plan has been implemented that does not rotate crew and is anticipated to increase the days away from home port from the current capability of 185 days to 200 days.[67]

OPC Program

Regarding the OPC program, the May 2018 GAO report states the following:

> DHS approved six key performance parameters (KPP) for the OPC related to the ship's operating range and duration, crew size, interoperability and maneuverability, and ability

[66] Government Accountability Office, *Home Security Acquisitions[:] Leveraging Programs' results Could Further DHS's Progress to Improve Portfolio Management*, May 2018, GAO-18-339SP, 109 pp., and Government Accountability Office, *Homeland Security Acquisitions[:]DHS Has Strengthened Management, but Execution and Affordability Concerns Endure*, GAO-16-338SP, March 2016, 110 pp. Hereinafter *GAO-18-339SP* and *GAO-16-338SP*, respectively.

[67] *GAO-18-339SP*, p. 92.

> to support operations in moderate to rough seas. The first OPC has not yet been constructed, so the USCG has not yet demonstrated whether it can meet these KPPs. The USCG plans to use engineering reviews, and developmental and operational tests throughout the acquisition to measure the OPC's performance.
>
> USCG officials told GAO that the program completed an early operational assessment on the basic ship design in August 2017, which entailed a review of the current design plans. The program plans to refine the ship's design as needed based on preliminary test results. However, as of December 2017, USCG officials had not received the results of this assessment.
>
> The USCG plans to conduct initial operational test and evaluation (OT&E) on the first OPC in fiscal year 2023. However, the test results from initial OT&E will not be available to inform key decisions. For example, the results will not be available to inform the decision to build 2 OPCs per year—which USCG officials said is scheduled to begin in fiscal year 2021. Without test results to inform these key decisions, the USCG must make substantial commitments prior to knowing how well the ship will meet its requirements....
>
> The USCG is in the process of completing the design of the OPC before starting construction, which is in-line with GAO shipbuilding best practices. In addition, USCG officials stated that the program is using state-of-the-market technology that has been proven on other ships as opposed to state-of-the-art technology, which lowers the risk of the program.[68]

FRC Program

Regarding the FRC program, the May 2018 GAO report states the following:

> In February 2017, DHS's Director, Office of Test and Evaluation (DOT&E) assessed the results from the program's July 2016 follow-on operational test and evaluation (OT&E) and determined that
>
> • the program met its six key performance parameters, and
>
> • the FRC was operationally effective and suitable.
>
> During follow-on OT&E, the OTA found that several deficiencies from the program's initial OT&E had been corrected. For example, the OTA closed a severe deficiency related to the engines based on modifications to the FRC's main diesel engines. However, five major deficiencies remain. According to USCG officials, the remaining deficiencies are related to ergonomics (e.g., improving the working environment for operators) and issues with stowage space. USCG officials stated that they plan to resolve the remaining deficiencies by fiscal year 2020.
>
> DOT&E noted that these deficiencies do not prevent mission completion or present a danger to personnel, but recommended that they be resolved as soon as possible. USCG officials indicated that they plan to resolve the remaining deficiencies through engineering or other changes....
>
> The USCG continues to work with the contractor—Bollinger Shipyards, LLC—to address issues covered by the warranty and acceptance clauses for each ship. For example, 18 engines—9 operational engines and 9 spare engines—have been replaced under the program's warranty. According to USCG documentation, 65 percent of the current issues with the engines have been resolved through retrofits; however, additional problems with the engines have been identified since our April 2017 review. For example, issues with water pump shafts are currently being examined through a root cause analysis and will be redesigned and are scheduled to undergo retrofits starting in December 2018. We

[68] *GAO-18-339SP*, p. 94.

> previously found that the FRC's warranty resulted in improved cost and quality by requiring the shipbuilder to pay for the repair of defects. As of September 2017, USCG officials said the replacements and retrofits completed under the program's warranty allowed the USCG to avoid an estimated $104 million in potential unplanned costs—of which $63 million is related to the engines.[69]

For a discussion of some considerations relating to warranties in shipbuilding and other acquisition programs, see **Appendix D**.

[69] *GAO-18-339SP*, p. 82. For additional discussions of warranties in acquisition programs, see **Appendix D**.

Appendix D. Some Considerations Relating to Warranties in Shipbuilding and Other Acquisition Programs

This appendix presents some considerations relating to warranties in shipbuilding and other defense acquisition.[70]

In discussions of Navy and Coast Guard shipbuilding, one question that sometimes arises is whether including a warranty in a shipbuilding contract is preferable to not including one.

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

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

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

From a cost standpoint, including a warranty in the contract might or might not be preferable, depending on the risk that there will be problems with earlier work that need fixing, the potential cost of fixing such problems, and the cost of including the warranty in the contract. The point is that the goal of avoiding highly visible payments for fixing problems with earlier work and the goal of minimizing the cost to the government of fixing problems with earlier work are separate and different goals, and that pursuing the first goal can sometimes work against achieving the second goal.[71]

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[70] This appendix is adapted from Appendix C of CRS Testimony TE10019, *Options and Considerations for Achieving a 355-Ship Navy*, by Ronald O'Rourke.

[71] It can also be noted that the country's two largest builders of Navy ships—General Dynamics (GD) and Huntington Ingalls Industries (HII)—derive about 60% and 96%, respectively, of their revenues from U.S. government work. (See General Dynamics, *2016 Annual Report*, page 9 of Form 10-K [PDF page 15 of 88]) and Huntington Ingalls Industries, *2016 Annual Report*, page 5 of Form 10-K [PDF page 19 of 134]). These two shipbuilders operate the only U.S. shipyards currently capable of building several major types of Navy ships, including submarines, aircraft carriers, large surface combatants, and amphibious ships. Thus, even if a warranty in a shipbuilding contract with one of these firms were to somehow mean that the government did not have pay under the terms of that contract—either up front or later

on—for fixing problems with earlier work done under that contract, there would still be a question as to whether the government would nevertheless wind up eventually paying much of that cost as part of the price of one or more future contracts the government may have that firm.

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

> Federal Acquisition Regulation (FAR) 46.7 states that "the use of warranties is not mandatory." However, if the benefits to be derived from the warranty are commensurate with the cost of the warranty, the CO [contracting officer] should consider placing it in the contract. In determining whether a warranty is appropriate for a specific acquisition, FAR Subpart 46.703 requires the CO to consider the nature and use of the supplies and services, the cost, the administration and enforcement, trade practices, and reduced requirements. The rationale for using a warranty should be documented in the contract file....
>
> In determining the value of a warranty, a CBA [cost-benefit analysis] is used to measure the life cycle costs of the system with and without the warranty. A CBA is required to determine if the warranty will be cost beneficial. CBA is an economic analysis, which basically compares the Life Cycle Costs (LCC) of the system with and without the warranty to determine if warranty coverage will improve the LCCs. In general, five key factors will drive the results of the CBA: cost of the warranty + cost of warranty administration + compatibility with total program efforts + cost of overlap with Contractor support + intangible savings. Effective warranties integrate reliability, maintainability, supportability, availability, and life-cycle costs. Decision factors that must be evaluated include the state of the weapon system technology, the size of the warranted population, the likelihood that field performance requirements can be achieved, and the warranty period of performance.[72]

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