

Coast Guard Cutter Procurement: Background and Issues for Congress

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Summary

The Coast Guard's acquisition 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 cutters and patrol craft. The Coast Guard's proposed FY2017 budget requests a total of \$467 million in acquisition funding for the NSC, OPC, and FRC programs.

NSCs are the Coast Guard's largest and most capable general-purpose cutters. They have an estimated average procurement cost of about \$684 million per ship. The first five are now in service. The sixth, seventh, and eighth are under construction and scheduled for delivery in 2016, 2018, and 2019, respectively. A ninth ship in the class, which was not requested by the Coast Guard, was funded by Congress in FY2016. The Coast Guard's proposed FY2017 budget requests \$127 million in acquisition funding for the NSC program for post-delivery activities on NSCs 4 through 8, program close-out, follow-on test and evaluation, program support, and procurement of small unmanned aerial systems (sUASs) for NSCs.

OPCs are to be smaller, less expensive, and in some respects less capable than NSCs. They have an estimated average procurement cost of about \$484 million per ship. The first OPC is to be procured in FY2018. Three shipyards—Bollinger Shipyards of Lockport, LA, Eastern Shipbuilding Group of Panama City, FL, and General Dynamics Bath Iron Works (GD/BIW) of Bath, ME—are competing for the contract to build the first 9 to 11 ships in the class. The Coast Guard's proposed FY2017 budget requests \$100 million in acquisition funding for the OPC program for technical review of detail design (DD) deliverables and procurement of long lead time material (LLTM) for the first ship.

FRCs are considerably smaller and less expensive than OPCs. They have an estimated average procurement cost of about \$73 million per boat. A total of 38 have been funded through FY2016. The 16th was commissioned into service on March 11, 2016. The Coast Guard's proposed FY2017 budget requests \$240 million in acquisition funding for the FRC program for the construction of four more FRCs.

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

- whether to fund the acquisition of a 10th NSC in FY2017;
- whether to fund the acquisition of four FRCs in FY2017, as requested, or some other number, such as six, which was the number projected for FY2017 under the Coast Guard's FY2016 budget submission;
- whether to use annual or multiyear contracting for procuring FRCs;
- whether to use annual or multiyear contracting for procuring OPCs;
- planned procurement quantities for NSCs, OPCs, and FRCs;
- the cost, design, and acquisition strategy for the OPC;
- initial testing of the NSC; and
- rotational crewing of the NSC.

Congress's decisions on these programs could substantially affect Coast Guard capabilities and funding requirements, and the U.S. shipbuilding industrial base.

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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). These 91 planned cutters are intended as replacements for 90 aging Coast Guard cutters and patrol craft. The Coast Guard's proposed FY2017 budget requests a total of \$467 million in acquisition funding for the three 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 an earlier CRS report that is now archived.¹ CRS testified on the Coast Guard's cutter acquisition programs on February 3, 2016.² 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 Reliance (WMEC-615) class ships that entered service between 1964 and 1969,⁷ and two one-of-a-kind cutters that originally entered service with the Navy in 1944 and 1971 and were later

¹ The earlier report was CRS Report RL33753, *Coast Guard Deepwater Acquisition Programs: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke. 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 entirely as a way of referring to these programs. Congress, in acting on the Coast Guard's proposed FY2012 budget, did not object to ending the use of the term Deepwater. Reflecting this development, CRS Report RL33753, *Coast Guard Deepwater Acquisition Programs: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke, was archived in early 2012, following final congressional action on the FY2012 budget, and remains available to congressional readers as a source of historical reference information on Deepwater acquisition efforts.

² See CRS Testimony TE10004, *The Status of Coast Guard Cutter Acquisition Programs*, by Ronald O'Rourke.

³ CRS Report RL34391, *Coast Guard Polar Icebreaker Modernization: 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.

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

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: eight of the Island-class patrol boats were removed from service in 2007 following an unsuccessful effort to modernize and lengthen them to 123 feet; the one-of-a-kind 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.

NSC Program

National Security Cutters (**Figure 1**), also known as Legend (WMSL-750) class cutters,¹² are the Coast Guard's largest and most capable general-purpose cutters.¹³ The Coast Guard's acquisition

⁸ The two one-of-a-kind cutters are 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 re-entered 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.)

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 FY2016 five-year Capital Investment Plan (CIP) estimates the total acquisition cost of the eight ships at \$5.559 billion, or an average of about \$695 million per ship.

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/.

NSCs are larger and technologically more advanced than Hamilton-class cutters.¹⁴ The Coast Guard states that

Of the Coast Guard’s white-hull patrol cutter fleet, the NSC is the largest and most technologically sophisticated in the Coast Guard. Each NSC is capable of operating in the most demanding open ocean environments, including the hazardous fisheries of the North Pacific and the vast approaches of the Southern Pacific where much of the American narcotics traffic occurs. With robust Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) equipment, stern boat launch and aviation facilities, as well as long-endurance station keeping, the NSCs are afloat

(...continued)

¹² In the designation WMSL, W means Coast Guard ship and MSL stands for maritime security cutter, large. NSCs are being named for legendary Coast Guard personnel.

¹³ 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.

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 Oliver Hazard Perry (FFG-7) class frigates, which are 453 feet long and have a full load displacement of about 4,200 tons.

operational-level headquarters for complex law enforcement and national security missions involving multiple Coast Guard and partner agency participation.¹⁵

NSCs are built by Ingalls Shipbuilding of Pascagoula, MS, a shipyard that forms part of Huntington Ingalls Industries (HII).

The first five are now in service (the fifth was commissioned into service on August 8, 2015).¹⁶ The sixth, seventh, and eighth are under construction and scheduled for delivery in 2016, 2018, and 2019, respectively.¹⁷ A ninth ship in the class, which was not requested by the Coast Guard, was funded in FY2016. For additional information on the status and execution of the NSC program from a March 2016 GAO report, see **Appendix C**.

The Coast Guard's proposed FY2017 budget requests \$127 million in acquisition funding for the NSC program for post-delivery activities on NSCs 4 through 8 (\$98.367 million), program close-out, follow-on test and evaluation, and program support (\$22.633 million), and procurement of small unmanned aerial systems (sUASs) for NSCs (\$6 million).

OPC Program

Offshore Patrol Cutters (**Figure 2**) are to be smaller, less expensive, and in some respects less capable than NSCs. The Coast Guard's POR calls for procuring 25 OPCs as replacements for the service's 29 medium-endurance cutters. The first OPC is to be procured in FY2018. The FY2016 CIP estimates the total acquisition cost of the 25 ships at \$10.523 billion, or an average of about \$421 million per ship. Coast Guard officials have described the OPC program as the service's top acquisition priority.

The service states that OPCs

will complement the Coast Guard's current and future fleet to extend the service's operational capabilities. The OPC will replace the service's 210-foot and 270-foot Medium Endurance Cutters. It will feature increased range and endurance, powerful weapons, a larger flight deck, and improved command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) equipment. The OPC will accommodate aircraft and small boat operations in all weather.¹⁸

The Coast Guard's Request for Proposal (RFP) for the program, released on September 25, 2012, establishes 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.¹⁹ 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,²⁰ or

¹⁵ U.S. Coast Guard description of the NSC, accessed April 26, 2013, at <http://www.uscg.mil/acquisition/nsc/features.asp>.

¹⁶ "Acquisition Update: Coast Guard Commissions Fifth National Security Cutter," August 10, 2015, accessed September 24, 2015, at <http://www.uscg.mil/acquisition/newsroom/updates/nsc081015.asp>.

¹⁷ "Acquisition Update: Sixth National Security Cutter Launched," September 15, 2015, accessed September 24, 2015, at <http://www.uscg.mil/acquisition/newsroom/updates/nsc091515.asp>. See also "Acquisition Update: Coast Guard Christens Sixth National Security Cutter," November 16, 2015, accessed January 27, 2016, at <http://www.uscg.mil/acquisition/newsroom/updates/nsc111615.asp>.

¹⁸ Coast Guard fact sheet on the OPC accessed April 26, 2013, at <http://www.uscg.mil/acquisition/opc/pdf/opc.pdf>.

¹⁹ Source: Section C.5 of the RFP, accessed October 31, 2012, at <http://www.uscg.mil/ACQUISITION/newsroom/updates/opc092512.asp>.

²⁰ GFE is equipment that the government procures and then delivers to the shipyard for installation on the ship.

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.²¹

Figure 2. Offshore Patrol Cutter (Generic Conceptual Rendering)



Source: U.S. Coast Guard generic conceptual rendering accessed May 3, 2012, at <http://www.uscg.mil/hq/cg9/opc/default.asp>.

The Coast Guard's acquisition strategy for the first 9 to 11 ships in the program is as follows:

The OPC procurement shall implement a two-phase down select strategy. Phase I entails a full and open competition for Preliminary and Contract Design (P&CD) awarded to a maximum of three offerors. The Coast Guard intends to competitively award the Phase I contract in Fiscal Year (FY) 2013. P&CD will culminate in a Contract Design Review (KDR). After KDR, the three contractors will submit proposals which will result in a down selection to one contractor to continue with Phase II.

(h) Phase II award is planned for FY16.... Phase II's down selection will be accomplished by exercising one option with a single contractor for Detail Design (DD) with additional options for Long Lead Time Materials, lead ship and eight to ten follow ships. DD will start after option exercise and be complete upon delivery of the first ship. The contractor will present the OPC design at the Initial Critical Design Reviews (ICDR) and Final Critical Design Review (FCDR) followed by a Production Readiness Review (PRR). During Phase II contract performance, the contractor will be encouraged to submit a fixed price proposal (before construction begins on the Hull #6) for option Hulls #6 through #11 (LRIP 2). If the priced effort is deemed fair and reasonable the contractor shall be eligible for Hulls #10 and #11. If not, the contract will continue with the FPI structure and the contract will end with Hull #9.²²

²¹ Source: Coast Guard emails to CRS dated June 25, 2013.

²² Source: Section C.1 of the RFP, accessed March 26, 2013, at <http://www.uscg.mil/ACQUISITION/newsroom/> (continued...)

At least eight shipyards expressed interest in the OPC program.²³ On February 11, 2014, the Coast Guard announced that it had awarded Phase I 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. A February 11, 2014, Coast Guard news release on the award stated:

The U.S. Coast Guard today awarded three firm fixed-price contracts for preliminary and contract design (P&CD) for the Offshore Patrol Cutter (OPC) acquisition project. The contracts were awarded to Bollinger Shipyards Lockport LLC (Lockport, La.), Eastern Shipbuilding Group Inc. (Panama City, Fla.), and General Dynamics, Bath Iron Works (Bath, Maine). The total value of the award is approximately \$65 million.

Awarding multiple design contracts ensures that competition is continued through to a potential down-select for detailed design and construction, establishes a fixed-price environment for the remainder of the contract, and incorporates a strategy to maximize affordability. This strategy was developed by analyzing lessons learned from other major government shipbuilding programs and through collaboration with industry on how to best design and produce the most affordable OPC....

The Coast Guard issued the P&CD Request for Proposal (RFP) Sept. 25, 2012. Responses were received in January 2013, and the Coast Guard conducted a thorough evaluation of proposals based on technical, management, past performance and price factors. To support the effort to acquire an affordable OPC, the Coast Guard engaged industry prior to RFP release through industry day events, one-on-one meetings and providing opportunities for potential offerors to review and comment on OPC draft technical packages, specifications and solicitation language.²⁴

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[updates/opc092512.asp](http://www.uscg.mil/hq/cg9/newsroom/updates/opc092512.asp).

²³The 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, WI; 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/archive/2013/April/Pages/NewCoastGuardCutterSparksFierceCompetitionAmongShipbuilders.aspx>.)

²⁴ “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 <http://www.uscg.mil/hq/cg9/newsroom/updates/opc021114.asp>.

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.)

The Coast Guard states that it plans to award the Phase 2 contract (i.e., select a winner from among the three competing firms) by the end of fiscal year 2016.²⁵ For additional information on the status and execution of the OPC program from a March 2016 GAO report, see **Appendix C**.

Section 223 of the Howard Coble Coast Guard and Maritime Transportation Act of 2014 (S. 2444/P.L. 113-281 of December 18, 2014) states:

SEC. 223. MULTIYEAR PROCUREMENT AUTHORITY FOR OFFSHORE PATROL CUTTERS.

In fiscal year 2015 and each fiscal year thereafter, the Secretary of the department in which the Coast Guard is operating may enter into, in accordance with section 2306b of title 10, United States Code, multiyear contracts for the procurement of Offshore Patrol Cutters and associated equipment.

The Coast Guard's proposed FY2017 budget requests \$100 million in acquisition funding for the OPC program for technical and project management (\$28.5 million) and procurement of long lead time material (LLTM) for the first ship (\$71.5 million).

FRC Program

Fast Response Cutters (**Figure 3**), also called Sentinel (WPC-1101) class patrol boats, are considerably smaller and less expensive than OPCs, but are larger than the Coast Guard's older patrol boats.²⁶ The Coast Guard's POR calls for procuring 58 FRCs as replacements for the service's 49 Island-class patrol boats. The FY2016 CIP estimates the total acquisition cost of the 58 cutters at \$3.764 billion, or an average of about \$65 million per cutter.

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.²⁷

The FRC program received approval from DHS to enter full-rate production on September 18, 2013.²⁸ A total of 38 FRCs have been funded through FY2016. The 16th was commissioned into service on March 11, 2016.²⁹

²⁵ "Offshore Patrol Cutter," last modified May 27, 2015, accessed September 24, 2015, at <http://www.uscg.mil/acquisition/opc/default.asp>.

²⁶ FRCs are 154 feet long and have a full load displacement of 353 tons.

²⁷ *Department of Homeland Security, United States Coast Guard, Fiscal Year 2013 Congressional Justification*, p. CG-AC&I-28 (pdf page 182 of 400).

²⁸ "Acquisition Update: Sentinel-class Fast Response Cutter Project Achieves Acquisition Milestone," September 18, 2013, accessed November 18, 2013, at <http://www.uscg.mil/acquisition/newsroom/updates/frc092413.asp>.

²⁹ "Acquisition Update: Coast Guard Commissions 16th Fast Response Cutter," March 14, 2016, accessed March 22, 2016, at <http://www.uscg.mil/acquisition/newsroom/updates/frc031416.asp>.

Figure 3. 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/.

FRCs are currently built by Bollinger Shipyards of Lockport, LA. Bollinger's contract with the Coast Guard originally included annual options for building a total of up to 34 FRCs through FY2014, but some of the annual options were not exercised by the Coast Guard to their maximum possible quantities, and Bollinger's contract wound up covering the 32 FRCs. (The Coast Guard on February 27, 2015, exercised a final option under the contract with Bollinger for ships 31 and 32.)³⁰ Ship awards under that contract are now completed.

The Coast Guard holds the data rights for the Sentinel-class design and on February 27, 2015, issued a Request for Proposals (RFP) for a contract that will include options for the acquisition of up to 26 FRCs (i.e., the remaining 26 ships in the program). Proposals from bidders were due by June 5, 2015.³¹ For additional information on the status and execution of the FRC program from a March 2016 GAO report, see **Appendix C**.

The Coast Guard's proposed FY2017 budget requests \$240 million in acquisition funding for the FRC program for the procurement of four more FRCs.

³⁰ "Acquisition Update: Coast Guard Exercises Contract Option for Fast Response Cutters 31 And 32," February 27, 2015, accessed March 6, 2015, at <http://www.uscg.mil/acquisition/newsroom/updates/frc022815.asp>.

³¹ "Acquisition Update: Coast Guard Issues Request for Proposal for Fast Response Cutters 33-58," February 27, 2015, accessed March 6, 2015, <http://www.uscg.mil/acquisition/newsroom/updates/frc022915.asp>.

Funding in FY2013-FY2017 Budget Submissions

Table 1 shows annual acquisition funding for the NSC, OPC, and FRC programs in the Coast Guard's FY2013-FY2017 budget submissions.

Table 1. NSC, OPC, and FRC Funding in FY2013-FY2017 Budget Submissions
(millions of then-year dollars)

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
NSC program									
FY13 budget	683	0	0	0	0				
FY14 budget		616	710	38	0	45			
FY15 budget			638	75	130	30	47		
FY16 budget				91.4	132	95	30	15	
FY17 budget					127	n/a	n/a	n/a	n/a
OPC program									
FY13 budget	30	50	40	200	530				
FY14 budget		25	65	200	530	430			
FY15 budget			20	90	100	530	430		
FY16 budget				18.5	100	530	430	430	
FY17 budget					100	n/a	n/a	n/a	n/a
FRC program									
FY13 budget	139	360	360	360	360				
FY14 budget		75	110	110	110	110			
FY15 budget			110	340	220	220	315		
FY16 budget				340	325	240	240	325	
FY17 budget					240	n/a	n/a	n/a	n/a
Total									
FY13 budget	852	410	400	560	890				
FY14 budget		716	885	348	640	585			
FY15 budget			768	505	450	780	792		
FY16 budget				449.9	557	865	700	370	
FY17 budget					467	n/a	n/a	n/a	n/a

Source: Table prepared by CRS based on FY2013-FY2017 budget submissions. n/a means not available.

Issues for Congress

Whether to Fund a 10th NSC in FY2017

One issue for Congress is whether to fund the acquisition of a 10th NSC in FY2017. The Coast Guard is not requesting procurement of a 10th NSC. Consequently, fully funding the acquisition of a 10th NSC in FY2017 would require providing roughly \$700 million in unrequested acquisition funding.

Opponents of funding the acquisition of a 10th NSC in FY2017 could argue that the Coast Guard's program of record calls for 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 providing roughly \$700 million in unrequested acquisition funding for a 10th NSC could require making offsetting reductions in other Coast

Guard or DHS programs, potentially adversely affecting those programs, and resultant Coast Guard or DHS capabilities.

Supporters of funding the acquisition of a 10th NSC in FY2017 could argue that the program of record requests only about 58% 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**), that a 10th NSC funded in FY2017 could be produced in an efficient heel-to-toe manner with the 9th NSC that was funded in FY2016, that a 10th NSC could be acquired together with the 9th NSC under a block buy contract,³² reducing acquisition costs for both ships, and that it could be more difficult to secure funding for the acquisition of a 10th NSC in FY2018 and beyond, due to funding requirements in those years for acquisition of OPCs.

Number of FRCs to Fund in FY2017

Another issue for Congress is whether to fund the acquisition of four FRCs in FY2017, as requested, or some other number, such as six, which was the number projected for FY2017 under the Coast Guard's FY2016 budget submission. As shown in **Table 1**, the Coast Guard's FY2017 budget requests \$240 million for the procurement of four FRCs, rather than the \$325 million for the procurement of six more FRCs that was projected for FY2017 in the Coast Guard's FY2016 budget submission.

Supporters of funding the acquisition of six rather than four FRCs in FY2017 could argue that the Coast Guard's FY2016 budget submission projected the acquisition of six FRCs in FY2017, that procuring six rather than four would increase production economies of scale and thus reduce the unit acquisition cost of the ships, and that procuring six rather than four will help the Coast Guard to close more quickly a gap in patrol boat capacity that is limiting the Coast Guard's ability to interdict illegal drugs and carry out other missions.

Supporters of funding the acquisition of four FRCs in FY2017, as requested by the Coast Guard, could argue that adding the \$85 million funding that would be needed to increase the FY2017 buy to six ships could require making offsetting reductions in other Coast Guard or DHS programs, potentially adversely affecting those programs, and resultant Coast Guard or DHS capabilities.

Annual or Multiyear Contracting for FRCs

Another issue for Congress is whether acquire the final 20 or 26 FRCs³³ using annual contracting or multiyear contracting in the form of multiyear procurement (MYP) or block buy contracting. The Coast Guard currently plans to use a contract with options for procuring the final 26 FRCs. A contract with options may look like a form of multiyear contracting, but operates more like a series of annual contracts. Contracts with options do not achieve the reductions in acquisition costs that are possible with MYP and block buy contracting. Congress would need to grant authority to the Coast Guard to use MYP or block buy contracting in the FRC program.

At a February 3, 2016, hearing on Coast Guard cutter acquisition before the Coast Guard and Maritime Transportation Subcommittee of the House Transportation and Infrastructure

³² For more on block buy contracting, see CRS Report R41909, *Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress*, by Ronald O'Rourke and Moshe Schwartz, and CRS Testimony TE10004, *The Status of Coast Guard Cutter Acquisition Programs*, by Ronald O'Rourke.

³³ The difference between 20 and 26 relates to whether the six FRCs funded in FY2016 are included in this discussion.

Committee, CRS testified that using MYP or block buy contracting rather than a contract with options to procure the final 20 or 26 FRCs could reduce the total FRC acquisition costs by more than \$100 million. CRS also testified that, as a general matter, using MYP or block buy contracting involves accepting certain tradeoffs, such as 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

Annual or Multiyear Contracting for OPCs

Another issue for Congress, similar to the FRC issue above, is whether acquire OPCs using annual contracting or multiyear contracting in the form of multiyear procurement (MYP) or block buy contracting. The Coast Guard currently plans to use a contract with options for procuring the first 9 to 11 OPCs. As stated in the FRC section above, a contract with options may look like a form of multiyear contracting, but operates more like a series of annual contracts. Contracts with options do not achieve the reductions in acquisition costs that are possible with MYP and block buy contracting.

As noted earlier, Section 223 of the Howard Coble Coast Guard and Maritime Transportation Act of 2014 (S. 2444/P.L. 113-281 of December 18, 2014) grants authority to use MYP in the OPC program. MYP typically cannot be used on the first several ships in a shipbuilding program because the law that regulates MYP (10 U.S.C. 2306b) requires a stable design for an acquisition program to qualify for MYP. In a shipbuilding program, a stable design is typically demonstrated by completing the construction of the first ship in the class, by which time the first several ships in the class typically have been funded and put under contract. Block buy contracting, by comparison, can be used at the start of a shipbuilding program, beginning with the first ship. As with MYP, authority for using block buy contracting must be granted by Congress. Since Section 223 of P.L. 113-281 grants authority to use MYP but not block buy contracting, Congress would need to grant authority to the Coast Guard to use block buy contracting in the OPC program.

At a February 3, 2016, hearing on Coast Guard cutter acquisition before the Coast Guard and Maritime Transportation Subcommittee of the House Transportation and Infrastructure Committee, CRS testified that if the Coast Guard were to use block buy contracting with economic order quantity (EOQ) purchases of components for acquiring the first several OPCs, and either MYP or block buy contracting with EOQ purchases for acquiring the remaining ships in the program, then the savings on the total acquisition cost of the 25 OPCs (compared to costs under contracts with options) could amount to roughly \$1 billion. As with the FRCs discussed above, using MYP or block buy contracting involves accepting certain tradeoffs, such as 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

³⁴ See CRS Testimony TE10004, *The Status of Coast Guard Cutter Acquisition Programs*, by Ronald O'Rourke.

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.³⁵

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, Coast Guard studies have concluded that the planned total of 91 NSCs, OPCs, and FRCs would provide 58% 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 first testified 2005,³⁶ see **Appendix A**.

Funding Level of Coast Guard's Acquisition Account

Another potential oversight issue for Congress concerns the funding level in the Coast Guard's acquisition account, known formally as the Acquisition, Construction, and Improvements (AC&I) account. The Coast Guard has testified that acquiring the ships and aircraft in its POR on a timely basis while also adequately funding other Coast Guard acquisition programs would require a funding level for the AC&I account of roughly \$1.5 billion to \$2.5 billion per year.

As shown in **Table 2** below, the Administration's FY2013 budget submission programmed an average of about \$1.5 billion per year in the AC&I account. As also shown in the table, subsequent budget submissions have reduced that figure to between \$1 billion and \$1.2 billion per year.

Table 2. Funding in AC&I Account in FY2013-FY2017 Budgets

Millions of dollars, rounded to nearest tenth

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	Avg.	% change compared to avg. for FY13 budget
FY13 budget	1,217.3	1,429.5	1,619.9	1,643.8	1,722.0					1,526.5	—
FY14 budget		951.1	1,195.7	901.0	1,024.8	1,030.3				1,020.6	-33.1%

³⁵ See CRS Testimony TE10004, *The Status of Coast Guard Cutter Acquisition Programs*, by Ronald O'Rourke.

³⁶ 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.

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	Avg.	% change compared to avg. for FY13 budget
FY15 budget			1,084.2	1,103.0	1,128.9	1,180.4	1,228.7			1,145.0	-25.0%
FY16 budget				1,017.3	1,125.3	1,255.7	1,201.0	1,294.6		1,178.8	-22.8%
FY17 budget					1,136.8	n/a	n/a	n/a	n/a	n/a	n/a

Source: Table prepared by CRS based on Coast Guard FY2013-FY2017 budget submissions. n/a means not available.

At a June 26, 2013, hearing on Coast Guard acquisition before the Coast Guard and Maritime Transportation subcommittee of the House Transportation and Infrastructure Committee, CRS testified that

The Coast Guard's FY2014 Five Year (FY2014-FY2018) CIP includes a total of about \$5.1 billion in acquisition funding, which is about \$2.5 billion, or about 33%, less than the total of about \$7.6 billion that was included in the Coast Guard's FY2013 Five Year (FY2013-FY2017) CIP. (In the four common years of the two plans—FY2014-FY2017—the reduction in funding from the FY2013 CIP to the FY2014 CIP is about \$2.3 billion, or about 37%.) This is one of the largest percentage reductions in funding that I have seen a five-year acquisition account experience from one year to the next in many years.

About twenty years ago, in the early 1990s, Department of Defense (DOD) five-year procurement plans were reduced sharply in response to the end of the Cold War—a large-scale change in the strategic environment that led to a significant reduction in estimated future missions for U.S. military forces. In contrast to that situation, there has been no change in the Coast Guard's strategic environment since last year that would suggest a significant reduction in estimated future missions for the Coast Guard.³⁷

For further discussion of this issue, see **Appendix B**.

OPC Program: Cost, Design, and Acquisition Strategy

Another potential oversight issue for Congress concerns the cost, design, and acquisition strategy for the OPC. Potential oversight questions for Congress include the following:

- Has the Coast Guard fully incorporated into the OPC acquisition strategy lessons learned from the NSC and FRC programs? What, in the Coast Guard's view, are those lessons?
- As mentioned earlier, the Coast Guard's RFP for the OPC program establishes an affordability requirement of an average unit price of \$310 million per ship, or less, in then-year dollars for ships 4 through 9 in the program (for the shipbuilder's portion of the total cost of the ship). How was the \$310 million figure determined?
- What process is the Coast Guard using to evaluate tradeoffs in OPC performance features against this target construction price? What performance features have been reduced or eliminated to meet the target construction price?

³⁷ Statement of Ronald O'Rourke, Specialist in Naval Affairs, Congressional Research Service, before the House Transportation and Infrastructure Committee, Subcommittee on Coast Guard and Maritime Transportation, Hearing on Coast Guard Readiness: Examining Cutter, Aircraft, and Communications Needs, June 26, 2013, p. 1.

- How much confidence does the Coast Guard have that the OPC that emerges from the tradeoff process could be built within the Coast Guard's target construction price?
- As mentioned earlier, the Coast Guard plans to evaluate the preliminary and contract design (P&CD) proposals and then award one of the competitors a contract for detailed design development and ship construction. What process does the Coast Guard plan to use in evaluating the P&CD efforts? What evaluation factors does the Coast Guard plan to use, and how much weight will be assigned to each?

A January 16, 2015, press report states

Coast Guard Commandant Adm. Paul Zukunft on Thursday [January 15] said that his staff is currently reviewing the requirements for its Offshore Patrol Cutter (OPC) with affordability in mind.

The "biggest challenge that we're facing right now is that this will not be affordable," Zukunft said at the annual Surface Navy Association conference in Arlington, Va. "I've turned it back to industry...bring me a capable platform that is also affordable."

Zukunft, who became commandant last May, is doing more than leave it to industry to design and produce a new and affordable medium endurance cutter for the Coast Guard. He told *Defense Daily* after his speech that he directed his "staff do a deep scrub on every one of the line items and so there are some line items in there that struck me."

For example, he said, what is the required water pressure for firefighting? If the requirement is set too high, that affects "piping, it affects weight, [and] how big of a pump do you need." Zukunft said it's this level of detail that is being scrubbed to figure out what is needed.

Zukunft describe[d] the requirements review as an "open dialogue" that is "fully transparent" with the shipbuilders competing for the 25-ship OPC buy free to weigh in.

The "competitors are very incentivized to come up with an affordable product for us as well," Zukunft said.³⁸

NSC Program: Initial Testing

Another potential oversight issue for Congress concerns the results of initial testing of the NSC. A January 2016 GAO report stated:

The U.S. Navy, the Coast Guard's independent test agent, completed initial testing for the National Security Cutter (NSC) in April 2014 and rated the NSC as operationally effective and suitable. Still, testing revealed 10 major deficiencies.... Initial testing is an event designed to verify performance of critical systems to ensure assets are capable of meeting mission requirements. The event tests critical operational issues and key performance parameters. The NSC fully met 12 of 19 key performance parameters. Tests of one key performance parameter, as well as other critical systems, were deferred to follow-on testing. The Coast Guard and the U.S. Navy disagree on the NSC's requirements for cutter boat operations. Without clear requirements the Navy and Coast Guard will not have a basis for determining actions to resolve any performance issues. Coast Guard officials acknowledged that clarifying these requirements would be beneficial.

³⁸ Calvin Biesecker, "With Affordability In Mind, Zukunft Reviewing OPC Requirements," *Defense Daily*, January 16, 2015: 4.

The Coast Guard plans to begin follow-on testing in fall 2016. It must submit corrective action plans to the U.S. Navy to close any deficiencies. According to Coast Guard documentation, it may choose not to correct all deficiencies due to the cost of changes. Department of Homeland Security (DHS) acquisition guidance does not specify the timing of follow-on testing or the actions to be taken in response to the findings. Without a definite time frame DHS risks encountering the same problems as the NSC program experienced with future acquisitions and fielding assets without knowing the full capabilities.

During operations, the NSC has experienced performance issues that were not identified during initial testing, and the Coast Guard has planned design changes to some of the cutters' equipment.... However, the Coast Guard has not yet found the causes for problems affecting the NSC's propulsion systems. As a result of these and other equipment failures, the NSC has been operating in a degraded condition in some mission areas. DHS has no plans for additional acquisition review boards for the NSC, which would provide oversight going forward. Continued management-level oversight by DHS would help ensure that problems identified during testing and operations are addressed.³⁹

NSC Program: Rotational Crewing

A March 2015 GAO report stated that

The Coast Guard has delayed the feasibility test for using the crew rotation concept (CRC) to achieve increased operational days at sea with its National Security Cutters (NSC) until 2019. In 2006, the Coast Guard decided to use the CRC for its NSCs and that implementation would begin in 2011. However, the Coast Guard has postponed CRC testing because of delays in NSC deliveries and needed structural enhancements. In fiscal year 2013, the Coast Guard began implementing an interim plan to increase the NSCs' operational performance, not by rotating crews, but by adding crew members to help bear the increased workload. However, the added crew members do not have the skill mix recommended by a 2011 manpower requirements analysis. Without the appropriate crew members with the right skill mix, the NSCs may not be able to complete all mission requirements or required maintenance.

The Coast Guard has not fully addressed a variety of risks that could affect the success of its planned CRC feasibility test and goal to increase NSC operational days away from home port (DAFHP) from 185 to 230 days per year using the CRC. Further, the Coast Guard could not provide us with complete details about whether the CRC plan, to be completed by the end of 2017, will include actions to address and effectively mitigate various risks, to include

- determining the appropriate number and skill mix of NSC crew members and support personnel and whether they will be in place in time for the CRC test;
- incorporating actual NSC maintenance needs when developing NSC maintenance schedules and goals;
- testing the CRC under realistic circumstances, such as addressing the misalignment of the crewing concept to be tested as compared to the NSC homeporting plan;
- addressing the potential impacts of wide variations between alternative deployment schedules using the CRC; and

³⁹ Government Accountability Office, *National Security Cutter[:]Enhanced Oversight Needed to Ensure Problems Discovered during Testing and Operations Are Addressed*, GAO-16-148, January 2016, summary page.

- implementing a training infrastructure and providing training support for off-cycle rotating crews.

As the Coast Guard continues to develop its CRC plan, establishing interim milestones for carrying out the actions needed to address and effectively mitigate these risks would help ensure that it addresses the risks in a timely manner.

The Coast Guard's current measure does not accurately quantify the operational performance of the NSC fleet. The Coast Guard primarily uses the DAFHP measure across its major cutter fleet; however, this measure includes days when a cutter is undergoing maintenance away from its home port and, as a result, will likely overstate the number of operational days. The Coast Guard has known of the measure's limitation for years and is exploring alternatives. However, since the CRC plan is premised on achieving 230 DAFHP per year—and that other Coast Guard vessels, such as the Offshore Patrol Cutter, also plan to use the DAFHP metric—implementing alternative measures prior to CRC testing will better ensure the test results are benchmarked against a more appropriate goal to quantify the operational performance of its fleet of NSCs and its planned fleet of Offshore Patrol Cutters.⁴⁰

Legislative Activity for FY2017

Summary of Appropriations Action on FY2017 Acquisition Funding Request

Table 3 summarizes appropriations action on the Coast Guard's request for FY2017 acquisition funding for the NSC, OPC, and FRC programs.

Table 3. Summary of Appropriations Action on FY2016 Acquisition Funding Request

Figures in millions of dollars, rounded to nearest tenth

Request	Request	House Appropriations Committee	Senate Appropriations Committee	Final
NSC program	127.0			
OPC program	100.0			
FRC program	240.0			
TOTAL	467.0			

Source: Table prepared by CRS based on Coast Guard's FY2017 budget submission and committee and conference reports.

⁴⁰ Government Accountability Office, Coast Guard[:] Timely Actions Needed to Address Risks in Using Rotational Crews, GAO-15-195, summary page.

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.

The Coast Guard estimates that with the POR’s planned force of 91 NSCs, OPCs, and FRCs, the service would have capability or capacity gaps⁴¹ in 6 of its 11 statutory missions—search and rescue (SAR); defense readiness; counter-drug 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 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 I (2009)

Ship type	Program of Record (POR)	Objective Fleet Mix From FMA Phase I	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 I, 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 objective fleet mix.

⁴¹ 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.

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 I (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 I, 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 I (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 I, Executive Summary, page ES-11 through ES-13.

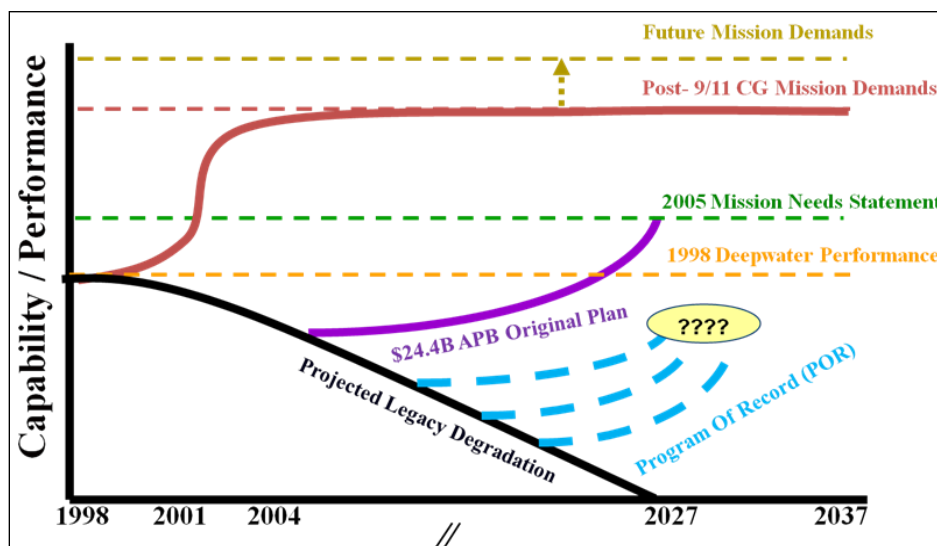
Notes: In the first column, The Coast Guard uses *capability* as a qualitative term, to refer to the kinds of missions that can be performed, and *capacity* as a quantitative term, to refer to how much (i.e., to what scale or volume) a mission can be performed.

- 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 I, Executive Summary



Source: Fleet Mix Analysis Phase I, 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.⁴² GAO again presented them in a July 2011 report.⁴³

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.

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.

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.

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.⁴⁴

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**

⁴² 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.

⁴³ Government Accountability Office, *Coast Guard[:]Action Needed As Approved Deepwater Program Remains Unachievable*, GAO-11-743, July 2011, p. 46.

⁴⁴ 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.

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.⁴⁵

A December 7, 2015, press report states:

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.

"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.⁴⁶

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?

⁴⁵ 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.

⁴⁶ Otto Kreisher, "'Not Enough' USCG Vessels to Meet Demand for Presence in South China Sea, Arctic," *Seapower*, December 7, 2015.

- 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**?

Appendix B. Funding Levels in AC&I Account

This appendix provides further discussion of the issue of funding levels in the Coast Guard's Acquisition, Construction, and Improvements (AC&I) account.

The Coast Guard has testified that funding the AC&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 an AC&I account of about \$1 billion to \$1.2 billion per year would leave about \$200 million to \$400 million per year for all other AC&I-funded programs.

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:

REPRESENTATIVE 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.⁴⁷

An April 18, 2012, blog entry stated:

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.⁴⁸

⁴⁷ Source: Transcript of hearing.

⁴⁸ 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>.

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 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."⁴⁹

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 AC&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.⁵⁰

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:

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

⁴⁹ 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/news/x1138492141/Coast-Guard-cutbacks-will-cost-1-000-jobs#axzz1wSDAFCzX>. 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.

⁵⁰ Transcript of hearing. The remarks were made in response to a question from Senator Mary Landrieu.

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 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.⁵¹

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:

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.⁵²

Although the annual amounts of acquisition funding that the Coast Guard has received in recent years are one potential guide to what Coast Guard acquisition funding levels might or should be in coming years, there may be other potential guides. For example, one could envision potential guides that focus on whether Coast Guard funding for ship acquisition and sustainment is commensurate with Coast Guard funding for the personnel that in many cases will operate the ships. Observations that might be made in connection with this example based on the Coast Guard and Navy budget submissions include the following:

- Using figures from the FY2014 budget submission, the Coast Guard has about 12.9% as many active-duty personnel as the Navy.⁵³ If the amount of funding for the surface ship acquisition and sustainment part of the AC&I account were equivalent to 12.9% of the amount of funding in the Navy's shipbuilding account, the surface ship acquisition and sustainment part of the AC&I account would be about \$1.8 billion per year.⁵⁴ Navy surface ship acquisition, unlike Coast Guard surface ship acquisition, includes substantial numbers of large and complex ships, including nuclear-powered aircraft carriers, highly capable surface combatants, and large amphibious and auxiliary ships. Accounting for this difference in Navy and Coast Guard surface ship acquisition by reducing the \$1.8 billion figure by, say, one-half or one-third would produce an adjusted figure of about \$900 million to about \$1.2 billion per year for surface ship acquisition and sustainment.

⁵¹ Transcript of hearing.

⁵² Transcript of hearing. The remarks were made in response to a question from Representative John Culberson.

⁵³ The Coast Guard for FY2014 appears to be requesting an active-duty end strength—the number of active-duty military personnel—of 41,594 (measured by the Coast Guard in full-time equivalent [FTE] positions); the Navy for FY2014 is requesting an active-duty end strength of 323,600.

⁵⁴ The Navy's proposed FY2014 budget requests \$14,078 million for the Shipbuilding and Conversion, Navy (SCN) appropriation account.

- Again using figures from the FY2014 budget submission, funding in the Navy's shipbuilding account is equivalent to about 51% of the Navy's funding for active-duty personnel.⁵⁵ If Coast Guard funding for surface ship acquisition and sustainment were equivalent to 51% of Coast Guard funding for military pay and allowances, the surface ship acquisition and sustainment part of the AC&I account would be about \$1.7 billion per year.⁵⁶ Reducing the \$1.8 billion figure by, say, one-half or one-third to account for differences in the types of surface ships acquired by the Navy and Coast Guard (see previous bullet point) would produce an adjusted figure of about \$850 million to about \$1.1 billion per year for surface ship acquisition and sustainment.

⁵⁵ The Navy's proposed FY2014 budget requested \$27,824 million for the Military Personnel, Navy (MPN) appropriation account.

⁵⁶ The Coast Guard's proposed FY2014 budget requested \$3,425.3 million for military pay and allowances.

Appendix C. Additional Information on Status and Execution of NSC, OPC, and FRC Programs from March 2016 GAO Report

This appendix presents additional information on the status and execution of the NSC, OPC, and FRC programs from a March 2016 GAO report reviewing DHS acquisition programs.⁵⁷

NSC Program

Regarding the NSC program, the GAO report states:

Notably, officials from six [DHS acquisition] programs explained that their current KPPs [key performance parameters] are still poorly defined and may require revisions going forward. For example, USCG officials identified that the NSC's cutter boat requirements should have been written more clearly, and, in January 2016, we recommended the NSC program office clarify them....⁵⁸

... DHS has not identified specific actions to improve the affordability of one of the programs that department leadership reviewed—USCG NSC—and this program continues to face a funding gap exceeding 10 percent. In this case, the USCG did not provide DHS leadership critical information necessary for addressing affordability issues.....⁵⁹

... the USCG NSC program—one of the department's largest investments—continues to face a funding gap exceeding 10 percent even though it was reviewed in September 2014. We found that the funding certification memo that the USCG provided to the DHS ARB [Acquisition Review Board] did not include as much detail as the others we reviewed across DHS components. Specifically, the NSC funding certification, signed by the USCG CFO [Chief Financial Officer], consisted of only a high-level narrative discussion, stating that adjustments would be made, as necessary, to sustain and operate the NSC. Unlike the other funding certifications we reviewed, it did not include detailed tables that quantified cost estimates, funding streams, and the monetary value of proposed tradeoffs. We also found that DHS leadership did not document any tradeoffs to improve the program's affordability after the September 2014 ARB. While the DHS CFO's June 2014 memorandum identifies that the success of the ARB reviews is dependent on the quality of the information presented to the ARB, it does not specify what information the components should include in the memos. It does not specifically require detailed information, such as quantifying cost estimates, funding streams, and the monetary value of proposed tradeoffs. We have previously established that information should be communicated to management in a form that enables them to carry out their responsibilities. Without detailed information, the ARB will be unable to hold fully informed discussions about tradeoffs needed to improve program affordability....⁶⁰

The [Coast Guard's C4ISR acquisition] program is continuing to work to replace the C4ISR [command and control, communications, computers, intelligence, surveillance, and reconnaissance] system on the NSC because it relies on contractor-proprietary

⁵⁷ Government Accountability Office, *Homeland Security Acquisitions[:]DHS Has Strengthened Management, but Execution and Affordability Concerns Endure*, GAO-16-338SP, March 2016, 110 pp. Hereafter GAO-16-338SP.

⁵⁸ GAO-16-338SP, p. 31.

⁵⁹ GAO-16-338SP, p. 32.

⁶⁰ GAO-16-338SP, p. 40.

software that is becoming obsolete and is costly to maintain. This transition has been delayed by more than 7 years largely due to funding shortfalls and, according to program officials, difficulties scheduling system installations when the NSCs are in port. Future funding shortfalls would likely delay the transition further, and it appears that the program's cost estimate exceeds its funding plan significantly from fiscal year 2016 to 2020. However, the gap may not be as great as it appears. The C4ISR funding plans DHS has presented to Congress do not identify all of the funding the USCG plans to allocate to C4ISR operations. GAO has reported on USCG affordability issues since 2011 (GAO-11-743). In April 2015, GAO recommended DHS account for all of the operations and maintenance funding the USCG is allocating to its major acquisition programs in an annual report to Congress. DHS concurred with this recommendation, but USCG officials told GAO they have made no progress in accounting for these funding allocations. This issue obscures the size of future funding gaps, and the actual amount allocated through fiscal year 2015 may be greater than \$797 million.

Test Activities [for the C4ISR program]

The USCG initially planned to test the C4ISR system separately from its planes and vessels, including the NSC, but officials subsequently decided to test the C4ISR system in conjunction with the planes and vessels to save money and avoid duplication. However, the C4ISR system's KPPs were not specifically evaluated during the NSC's operational test because the necessary testing activities were not fully integrated into the NSC test plan. The USCG deferred a significant portion of the C4ISR testing on the NSC to later dates including the testing of cybersecurity capabilities and real-time tactical communications with the Navy. In June 2014, GAO recommended the USCG fully integrate C4ISR assessments into other assets' operational test plans or test the C4ISR program independently in order to assess the operational effectiveness and suitability of the C4ISR system. The USCG concurred with GAO's recommendation and stated that it planned to test the C4ISR system's KPPs during follow-on testing for the NSC. The NSC's follow-on operational test and evaluation was scheduled for fiscal year 2015, but slipped to the end of fiscal year 2016 when the USCG refined the NSC's testing schedule. In the meantime, the USCG is using the C4ISR system on deployed NSCs....⁶¹

Performance

The USCG has been operating the NSC since 2010, and it initiated production of the eighth NSC in 2015, but it has not yet demonstrated the NSC can fully meet 7 of its 19 key performance parameters (KPP). In September 2015, USCG officials indicated they were in the process of validating data that would demonstrate the NSC could meet the KPP that establishes the NSC's transit range requirement. The NSC's other unmet KPPs include those related to unmanned aircraft, cutter-boat deployment, and interoperability requirements.

Acquisition Strategy

The USCG awarded delivery and task orders to produce the first three NSCs to Integrated Coast Guard Systems—a joint venture between Northrop Grumman and Lockheed Martin—as part of the now-defunct acquisition effort designated Deepwater. In 2006, the USCG revised its Deepwater acquisition strategy, citing cost increases, and took over the role of lead systems integrator, acknowledging that it had relied too heavily on contractors. In 2010, the USCG awarded the production contract for the fourth NSC to Northrop Grumman. In 2011, Northrop Grumman spun off its shipbuilding sector as an independent company named Huntington Ingalls Industries (HII). HII is producing the

⁶¹ GAO-16-338SP, p. 86.

sixth, seventh, and eighth NSCs for the USCG, and plans to deliver the eighth NSC in 2019.

Program Execution

From 2008 to 2014, the program's schedule for completing developmental testing slipped nearly 5 years, and its schedule for completing initial operational testing slipped nearly 3 years. In July 2011, GAO reported on a number of issues the USCG identified during developmental testing that the USCG needed to address before initiating operational testing, including performance and safety issues (GAO-11-743). The program's full operational capability date also slipped, from fiscal year 2016 to fiscal year 2020, although program officials anticipate it will occur sooner. USCG officials attributed the schedule slips to, among other things, funding shortfalls. The NSC has adhered to the revised schedule since January 2014, but going forward, the NSC is projected to face additional funding shortfalls. From fiscal year 2016 to fiscal year 2020, the NSC's costs are projected to exceed its funding by \$401 million. However, the funding gap may not be as large as it appears. The NSC funding plan DHS has presented to Congress does not identify all of the funding the USCG plans to allocate to the NSC's operations. GAO has reported on USCG affordability issues since 2011. In April 2015, GAO recommended DHS account for all of the operations and maintenance funding the USCG is allocating to its major acquisition programs in an annual report to Congress. DHS concurred with this recommendation, but USCG officials told GAO they have made no progress in accounting for these funding allocations. This issue obscures the size of the future funding gaps, and the amount allocated through fiscal year 2015 may be greater than \$5.7 billion.

From 2008 to 2014, the program's acquisition cost estimate increased from \$4.7 billion to \$5.7 billion. The USCG primarily attributed this increase to the lingering impacts of Hurricane Katrina, which struck the region where the NSCs are being built in 2005. USCG officials explained that the hurricane created labor shortages, which increased rates and decreased productivity. Alternatively, from 2008 to 2014, the program's life-cycle cost estimate decreased from \$24.3 billion to \$21.9 billion. USCG officials attributed this decrease to increasingly accurate cost estimates for personnel, materials, and maintenance. The program's approved cost thresholds remained stable from January 2014 to January 2016.

Test Activities

The NSC completed its initial operational testing in 2014, and the Department of Homeland Security's (DHS) Director of Operational Test and Evaluation (DOT&E) subsequently found the NSC operationally effective and suitable. However, testing identified several major deficiencies, and the USCG did not demonstrate the NSC could fully meet 7 of its 19 KPPs. For example, the USCG has not yet procured an unmanned aircraft system for the NSC, and has not yet demonstrated the NSC can meet the related KPP. Three of the NSC's unmet KPPs are related to cutter-boat deployment in rough seas. USCG officials indicated that challenges remain in determining a path forward to resolve these KPPs because the USCG and its operational test agent have different interpretations of the cutter boat requirements. In January 2016, GAO recommended the NSC program office clarify the KPPs for the cutter boats.

USCG officials have indicated that all deficiencies and unmet KPPs will be tested as part of follow-on operational test and evaluation (FOT&E), but it is unclear when the USCG will complete the NSC's FOT&E. The USCG has planned test activities through the end of fiscal year 2017 and USCG officials indicated that DOT&E will independently assess the FOT&E results. However, it is unclear when the USCG will actually demonstrate the NSC can meet its unmanned aircraft and intelligence requirements. In January 2016, GAO recommended DHS specify when the USCG must complete the NSC's FOT&E and any further actions the NSC program should take following FOT&E.

Other Issues

In May 2015, DHS reported the program office had 55 full time equivalents (FTE) but needed 62 FTEs. USCG officials have told GAO this has made it difficult to obligate funds in a timely manner. However, according to USCG officials, as of September 2015 the program office was in the process of hiring staff to fill several vacancies.

Program Office Comments [from the Coast Guard]

Cost estimates cited herein are threshold values taken from the approved NSC baseline. They do not reflect current estimates to complete based on updated data, which includes actual production contract award amounts for NSCs 7 and 8. The NSC program completed IOT&E [initial operational test and evaluation] in 2014 and continues to work with DHS to complete remaining testing and resolve pending discrepancies. Delaying IOT&E was a deliberate decision to ensure maximum benefits from the testing and resulted in the Navy evaluator's assessment that the NSC is "Operationally Effective and Suitable." Despite not fully completing all aspects of IOT&E, recent NSC operations have resulted in rarely seen magnitudes of law enforcement success. USCGC BERTHOLF recently seized nearly 29,000 pounds of cocaine, part of a remarkable 2015 interagency/partner nation effort which included more than 110 interdictions, the arrest of 700 suspected smugglers, and the seizure of 709,888 pounds of cocaine worth roughly \$9.4 billion.

GAO Response

Across all 25 program assessments [in this GAO report], GAO has reported threshold cost estimates because they are the maximum costs authorized by DHS leadership. DHS leadership approved an updated NSC cost estimate in September 2014, but it has not changed the program's maximum authorized cost.⁶²

OPC Program

Regarding the OPC program, the GAO report states:

Performance

Department of Homeland Security (DHS) leadership has approved six key performance parameters (KPP) for the OPC, establishing goals for the ship's operating range and duration, crew size, interoperability and maneuverability, and ability to conduct 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.

Acquisition Strategy

The USCG is using a two-phased down-select strategy to select a contractor to deliver the OPC. First, the USCG conducted a full and open competition to select three contractors to perform preliminary and contract design work, and in February 2014, the USCG awarded fixed-price contracts to Eastern Shipbuilding Group, Bollinger Shipyards, and Bath Iron Works for phase 1. Second, in late fiscal year 2016, for phase 2, the USCG plans to select one of these three contractors to develop a detailed design of the OPC, and construct the first 9 to 11 ships.

Program Execution

⁶² GAO-16-338SP, pp. 95-96.

From 2012 to 2016, the program's initial operational test and evaluation (IOT&E) date slipped 12 months, and its initial and full operational capability dates both slipped 15 months. Additionally, the program's preliminary design review date slipped 13 months, including 4 months during 2015. USCG officials said they completed the contract design review in March 2015, but they did not expect to complete the preliminary design review until January 2016. USCG officials attributed these schedule slips to delays in awarding the three preliminary and contract design contracts, and a subsequent bid protest that was filed with GAO. GAO denied the protest in June 2014.

In June 2014, GAO identified that the OPC's schedule had slipped 14 years between 2007 and 2014. Going forward, USCG officials have stated that additional OPC delays will decrease the USCG's operational capacity because the aging Medium Endurance Cutters will require increased downtime for maintenance and other issues, reducing their availability.

The OPC's acquisition and life-cycle cost estimates did not change from 2012 to 2015. However, in June 2014, GAO reported that the OPC program's acquisition cost estimate had increased by \$4 billion from 2007 to 2012. USCG officials said this increase was largely due to invalid assumptions in the earlier cost estimate, along with schedule delays and inflation.

Test Activities

DHS's Director of Operational Test and Evaluation approved the OPC Test and Evaluation Master Plan (TEMP) in October 2011, but the USCG has issued an interim TEMP to reflect schedule changes resulting from the bid protest. The USCG now plans to conduct IOT&E on the first OPC in fiscal year 2023. USCG officials told GAO that they have been working closely with DHS's Office of Test and Evaluation and U.S. Navy test officials since 2010 to incorporate testing into the program.

Other Issues

The program is currently projected to have a \$1.2 billion funding shortfall from fiscal years 2016 to 2020. Program officials said this is because the OPC's current cost estimate does not reflect its schedule delays, and that they are working to update the cost estimate. Nonetheless, in 2012, DHS's Chief Financial Officer raised concerns that the OPC's costs could grow as other shipbuilding programs' costs have grown in the past, and could ultimately affect the affordability of other USCG acquisition programs. In June 2014, GAO reported that the OPC will absorb about two-thirds of the USCG's acquisition funding from 2018 to 2032, and recommended that the USCG develop a 20-year fleet modernization plan that identifies all acquisitions needed to maintain the current level of service, along with tradeoffs if the funding needed to execute the plan is not consistent with annual budgets. The USCG concurred with this recommendation but did not identify an estimated date for completing the plan, and USCG officials told GAO they had not identified what tradeoffs they would make to address affordability issues.

In May 2015, DHS headquarters identified that the program office needed 26 full time equivalents (FTE) and actually had 20 FTEs. However, in December 2015, program officials told GAO the program now only needs 20 FTEs, but is still 3 short. Program officials also said that these shortfalls did not significantly affect the program.

Program Office Comments [from the Coast Guard]

The USCG provided technical comments that GAO addressed as appropriate.⁶³

⁶³ GAO-16-338SP, pp. 97-98.

FRC Program

Regarding the FRC program, the GAO report states:

Officials from 8 of the 11 programs that remained on track during 2015 said their programs were at risk of future schedule slips, cost growth, or both due to anticipated funding constraints, workforce challenges, expanded development efforts, and other reasons. These 8 programs include 7 that previously experienced schedule slips, cost growth, or both. For example, officials from the USCG Fast Response Cutter (FRC) program said that funding shortfalls could affect the number of cutters they are able to procure each year, which could increase costs. Currently, the USCG plans to award a contract by the end of June 2016 that will allow the USCG to purchase 4 to 6 cutters per year, depending on available funding levels. In June 2014, we reported that the USCG estimated a decision to order fewer ships per year would likely increase the program's costs by \$600 million to \$800 million beyond its current estimates....⁶⁴

Performance

The FRC partially met one of its six key performance parameters (KPP) during initial operational test and evaluation (IOT&E) in fiscal year 2013. The other five KPPs were not met or not tested. In September 2015, USCG officials told GAO the FRC had since demonstrated it could meet all six of its KPPs, but the Department of Homeland Security's (DHS) Director of Operational Test and Evaluation (DOT&E) has not validated the FRC's performance since IOT&E. The FRC's follow-on operational test and evaluation (FOT&E) is scheduled for June 2016.

Acquisition Strategy

In September 2008, USCG officials awarded Bollinger Shipyards Lockport a contract for 1 FRC with options to build up to 33 more. GAO subsequently received a bid protest, which was denied, and upheld the USCG's contract award in January 2009. In May 2014, the USCG established that it would only procure 32 FRCs through this contract. In June 2014, GAO reported that the USCG purchased the technical specifications and licenses from Bollinger that are necessary to build the FRC, and planned to use this information to conduct a full and open competition for the remaining 26 vessels. The USCG has designated this effort Phase 2 of the program.

The USCG began Phase 2 with a request for proposals (RFP), all of which were to be received by July 2015. According to program officials, they plan to award the Phase 2 contract by the end of June 2016. According to USCG officials, the Phase 2 RFP allowed the bidders to make certain changes to the design of the ship, though the key performance parameters remain the same as for Phase 1. In addition, the design for several critical systems—such as the propulsion system, generators, hull structure, and bridge layout—remained consistent with the Phase 1 design.

Program Execution

Previously, the program's initial operational capability date slipped from December 2012 to August 2013 because of the bid protest and the need for structural modifications. Additionally, the program's full operational capability date slipped from September 2022 to March 2027 because, according to USCG officials, the procurement quantities for the FRC changed under the Phase 1 contract. In fiscal years 2010 and 2011, the quantities decreased from six FRCs per year to four. Under the Phase 2 contract, program officials said the USCG will be able to purchase four to six FRCs per year. The USCG has established that the annual procurement quantity will be dictated by funding levels, and a

⁶⁴ GAO-16-338SP, p. 17.

\$143 million gap appears to remain between the program's projected funding levels and estimated costs through fiscal year 2020. Program officials told GAO that funding shortfalls could cause further delays going forward, but maintained that the program is still on track to meet its cost goals. Nonetheless, in June 2014, GAO reported that the USCG estimated the decision to order fewer ships per year will likely increase the program's costs by \$600 million to \$800 million beyond its current estimates.

The FRC's projected funding gap may not actually be \$143 million from fiscal year 2016 to fiscal year 2020. The FRC funding plan DHS has presented to Congress does not identify all of the funding the USCG plans to allocate to FRC operations. GAO has reported on USCG affordability issues since 2011 (GAO-11-743). In April 2015, GAO recommended DHS account for all of the operations and maintenance funding the USCG is allocating to its major acquisition programs in an annual report to Congress. DHS concurred with the recommendation, but USCG officials told GAO they have made no progress in accounting for these funding allocations. This issue obscures the size of future funding gaps, and the actual amount allocated through fiscal year 2015 may be greater than \$2.1 billion.

Test Activities

In 2009, DOT&E approved the FRC program's Test and Evaluation Master Plan (TEMP). In 2012, USCG officials updated the TEMP in preparation for IOT&E, which was conducted in fiscal year 2013 and assessed three of the program's six KPPs. At that time, the FRC did not fully meet any of them. IOT&E also revealed several major deficiencies, the most significant of which involved the FRC's cutter boat, which exhibited problems operating in moderate sea conditions, and the FRC's main diesel engines, which had multiple equipment failures during testing. Subsequently, independent testers from the U.S. Navy concluded the FRC was operationally effective, but not operationally suitable.

USCG officials told GAO they have improved the FRC's performance since the 2013 IOT&E. For example, they replaced and successfully tested the FRC's cutter boat, worked with the engine manufacturer to determine the root cause of equipment failures, and have begun retrofitting the engines. USCG officials stated the FRC has demonstrated it can meet all six of its KPPs, but DOT&E will not validate the FRC's performance until the USCG completes its FOT&E, which is scheduled for June 2016.

In January 2015, USCG officials told GAO that they were updating the TEMP again in preparation for FOT&E, and that they expected DOT&E would approve the updated TEMP by June 2015. However, it has taken the USCG longer than anticipated to update the TEMP, and in September 2015, USCG officials stated that they were still working on the updates.

Other Issues

In May 2015, DHS headquarters reported that the program required five additional staff, but in September 2015, program officials told GAO that number was down to one. The open staff position was for a naval architect, and the officials said that they were in the process of filling the position.

Program Office Comments [from the Coast Guard]

The FRC program has delivered 15 FRCs and 14 of those have been commissioned. In the past year, FRCs have rescued 117 undocumented migrants. In a Joint Operation, an FRC intercepted a smuggling vessel carrying 212 kg of cocaine, worth an estimated value

of over \$7 million. The FRC program looks forward to demonstrating the capabilities of the FRC during FOT&E.⁶⁵

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⁶⁵ *GAO-16-338SP*, pp. 87-88.