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# Coast Guard Cutter Procurement: Background and Issues for Congress

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## Summary

The Coast Guard's program of record (POR) calls for procuring 8 National Security Cutters (NSCs), 25 Offshore Patrol Cutters (OPCs), and 58 Fast Response Cutters (FRCs) as replacements for 90 aging Coast Guard cutters and patrol craft. The NSC, OPC, and FRC programs have a combined estimated acquisition cost of about \$21.1 billion, and the Coast Guard's proposed FY2016 budget requests a total of \$449.9 million in acquisition funding for the three 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 four are now in service, the fifth through seventh are in various stages of construction, and long lead time materials (LLTM) are being procured for the eighth. The Coast Guard's proposed FY2016 budget requests \$638 million for the NSC program, including \$91.4 million in acquisition funding for the NSC program.

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 FY2017. The Coast Guard's proposed FY2016 budget requests \$18.5 million in acquisition funding for the OPC program.

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 32 have been funded through FY2015. The 11<sup>th</sup> was commissioned into service on January 24, 2015, and the 12<sup>th</sup> is scheduled to be commissioned in March 2015. The Coast Guard's proposed FY2016 budget requests \$340 million in acquisition funding for the FRC program.

The NSC, OPC, and FRC programs pose several oversight issues for Congress. 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 began procuring NSCs and FRCs a few years ago, and the first few NSCs and FRCs are now in service. The Coast Guard plans to begin procuring OPCs within the next few years. The NSC, OPC, and FRC programs have a combined estimated acquisition cost of about \$21.1 billion, and the Coast Guard's proposed FY2016 budget requests a total of \$449.9 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.<sup>1</sup> The Coast Guard's plans for modernizing its fleet of polar icebreakers are covered in a separate CRS report.<sup>2</sup>

## 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).<sup>3</sup> The Coast Guard's 12 Hamilton (WHEC-715) class high-endurance cutters entered service between 1967 and 1972.<sup>4</sup> The Coast Guard's 29 medium-endurance cutters

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<sup>1</sup> 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* 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.

<sup>2</sup> CRS Report RL34391, *Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>3</sup> 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.

<sup>4</sup> Hamilton-class cutters are 378 feet long and have a full load displacement of about 3,400 tons.

include 13 Famous (WMEC-901) class ships that entered service between 1983 and 1991,<sup>5</sup> 14 Reliance (WMEC-615) class ships that entered service between 1964 and 1969,<sup>6</sup> and two one-of-a-kind cutters that originally entered service with the Navy in 1944 and 1971 and were later transferred to the Coast Guard.<sup>7</sup> The Coast Guard's 49 110-foot Island (WPB-1301) class patrol boats entered service between 1986 and 1992.<sup>8</sup>

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.<sup>9</sup>

## 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.<sup>10</sup>

<sup>5</sup> Famous class cutters are 270 feet long and have a full load displacement of about 1,800 tons.

<sup>6</sup> Reliance class cutters are 210 feet long and have a full load displacement of about 1,100 tons.

<sup>7</sup> 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.

<sup>8</sup> Island-class boats are 110 feet long and have a full load displacement of about 135 to 170 tons.

<sup>9</sup> Government Accountability Office, *Coast Guard[:]Legacy Vessels' Declining Conditions Reinforce Need for More Realistic Operational Targets*, GAO-12-741, July 2012, 71 pp.

<sup>10</sup> 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.)

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,<sup>11</sup> are the Coast Guard's largest and most capable general-purpose cutters.<sup>12</sup> The Coast Guard's 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 FY2015 five-year Capital Investment Plan (CIP) estimates the total acquisition cost of the eight ships at \$5.504 billion, or an average of about \$688 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//in/set-72157629650794895/](http://www.flickr.com/photos/coast_guard/5617034780/sizes//in/set-72157629650794895/).

<sup>11</sup> 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.

<sup>12</sup> 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.

NSCs are larger and technologically more advanced than Hamilton-class cutters.<sup>13</sup> 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 operational-level headquarters for complex law enforcement and national security missions involving multiple Coast Guard and partner agency participation.<sup>14</sup>

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

The first three NSCs are now in service (the fourth was commissioned into service on December 6, 2014), the fifth through seventh are in various stages of construction, and the eighth was funded in FY2015.

The Coast Guard's proposed FY2016 budget requests \$91.4 million in acquisition funding for the NSC program for structural enhancements on the first two NSCs and post-delivery activities on NSCs 5 through 8.

## 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. Under the Coast Guard's FY2015 five-year CIP, it appears (based on programmed annual funding levels) that the first OPC is to be procured in FY2018. The FY2015 CIP estimates the total acquisition cost of the 25 ships at \$10.523 billion, or an average of about \$421 million per ship.

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.<sup>15</sup> 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,<sup>16</sup> or other program costs—such as those for program management, system integration, and logistics—that contribute to the above-cited figure of \$421 million per ship.<sup>17</sup>

<sup>13</sup> 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.

<sup>14</sup> U.S. Coast Guard description of the NSC, accessed April 26, 2013, at <http://www.uscg.mil/acquisition/nsc/features.asp>.

<sup>15</sup> Source: Section C.5 of the RFP, accessed October 31, 2012, at <http://www.uscg.mil/ACQUISITION/newsroom/updates/opc092512.asp>.

<sup>16</sup> GFE is equipment that the government procures and then delivers to the shipyard for installation on the ship.

<sup>17</sup> Source: Coast Guard emails to CRS dated June 25, 2013.



**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 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.<sup>18</sup>

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 FY.... 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

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

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.<sup>19</sup>

At least eight shipyards expressed interest in the program. The firms were:

- Bollinger Shipyards of Lockport, LA;
- Eastern Shipbuilding Group of Panama City, FL;
- General Dynamics Bath Iron Works (GD/BIW) of Bath, ME;
- Huntington Ingalls Industries (HII) of Pascagoula, MS;
- Marinette Marine Corporation of Marinette, WS;
- General Dynamics National Steel and Shipbuilding Company (GD/NASSCO) of San Diego, CA;
- Vigor Shipyards of Seattle, WA; and
- VT Halter Marine of Pascagoula, MS.<sup>20</sup>

On February 11, 2014, the Coast Guard announced that it had awarded Phase I Preliminary and Contract Design (P&CD) contracts to **Bollinger**, **Eastern**, and **GD/BIW**. 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....

<sup>19</sup> Source: Section C.1 of the RFP, accessed March 26, 2013, at <http://www.uscg.mil/ACQUISITION/newsroom/updates/opc092512.asp>.

<sup>20</sup> 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](http://www.nationaldefensemagazine.org)), April 2013, accessed March 26, 2013, at <http://www.nationaldefensemagazine.org/archive/2013/April/Pages/NewCoastGuardCutterSparksFierceCompetitionAmongShipbuilders.aspx>.

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.<sup>21</sup>

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.<sup>22</sup> 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.<sup>23</sup>

The Coast Guard's proposed FY2016 budget requests \$18.5 million in acquisition funding for the OPC program for technical and project management (\$4.7 million) and design and development work (\$13.8 million). The Coast Guard states, "The Administration's [FY2016 budget] request includes a [proposed legislative] General Provision permitting a transfer [of additional funding] to the OPC project if the program is ready to award the next phase of vessel acquisition in FY 2016."<sup>24</sup>

## 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.<sup>25</sup> The Coast Guard's POR calls for procuring 58 FRCs as replacements for the service's 49 Island-class patrol boats. The FY2015 CIP estimates the total acquisition cost of the 58 cutters at \$3.928 billion, or an average of about \$68 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.

<sup>21</sup> U.S. Coast Guard news release entitled, "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>.

<sup>22</sup> 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.

<sup>23</sup> 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* ([www.defensenews.com](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.

<sup>24</sup> *Department of Homeland Security, United States Coast Guard, Fiscal Year 2016 Congressional Justification*, p. CG-AC&I-30.

<sup>25</sup> FRCs are 154 feet long and have a full load displacement of 353 tons.

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.<sup>26</sup>

### 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/](http://www.flickr.com/photos/coast_guard/6871815460/sizes/l/in/set-72157629286167596/).

The FRC program received approval from DHS to enter full-rate production on September 18, 2013.<sup>27</sup> A total of 32 FRCs have been funded through FY2015. The 11<sup>th</sup> was commissioned into service on January 24, 2015, and the 12<sup>th</sup> is scheduled to be commissioned in March 2015.<sup>28</sup>

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

<sup>26</sup> *Department of Homeland Security, United States Coast Guard, Fiscal Year 2013 Congressional Justification*, p. CG-AC&I-28 (pdf page 182 of 400).

<sup>27</sup> "Acquisition Update: Sentinel-class Fast Response Cutter Project Achieves Acquisition Milestone," September 18, 2013, accessed November 18, 2013, <http://www.uscg.mil/acquisition/newsroom/updates/frc092413.asp>.

<sup>28</sup> "Acquisition Update: Coast Guard Commissions 11<sup>th</sup> Fast Response Cutter into Service," January 27, 2015, accessed March 6, 2015, <http://www.uscg.mil/acquisition/newsroom/updates/frc012715.asp>; and "Acquisition Update: 12<sup>th</sup> Fast Response Cutter Delivered to Coast Guard," January 16, 2015, accessed March 6, 2015, <http://www.uscg.mil/acquisition/newsroom/updates/frc011615.asp>.

on February 27, 2015, exercised a final option under the contract with Bollinger for ships 31 and 32.)<sup>29</sup> 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 are due by June 5, 2015.<sup>30</sup>

The Coast Guard's proposed FY2016 budget requests \$340 million in acquisition funding for the FRC program.

## NSC, OPC, and FRC Funding in FY2013-FY2016 Budget Submissions

**Table 1** shows annual acquisition funding for the NSC, OPC, and FRC programs in the Coast Guard's FY2013-FY2016 budget submissions.

**Table 1. NSC, OPC, and FRC Funding in FY2013-FY2016 Budget Submissions**  
(millions of then-year dollars)

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
<b>NSC program</b>								
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	n/a	n/a	n/a	n/a
<b>OPC program</b>								
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	n/a	n/a	n/a	n/a
<b>FRC program</b>								
FY13 budget	139	360	360	360	360			
FY14 budget		75	110	110	110	110		
FY15 budget			110	340	220	220	315	
FY16 budget				340	n/a	n/a	n/a	n/a
<b>Total</b>								
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	n/a	n/a	n/a	n/a

**Source:** FY2013-FY2016 budget submissions; "n/a" = not available.

<sup>29</sup> "Acquisition Update: Coast Guard Exercises Contract Option for Fast Response Cutters 31 And 32," February 27, 2015, accessed March 6, 2015, <http://www.uscg.mil/acquisition/newsroom/updates/frc022815.asp>.

<sup>30</sup> "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>.

## Issues for Congress

### Planned NSC, OPC, and FRC Procurement Quantities

One potential oversight 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 be considerably fewer ships than the number 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. CRS first testified about this issue in 2005.<sup>31</sup>

The Coast Guard estimates that with the POR's planned force of 91 NSCs, OPCs, and FRCs, the service would have capability or capacity gaps<sup>32</sup> 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 2** compares planned numbers of NSCs, OPCs, and FRCs in the POR to those in the objective fleet mix.

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<sup>31</sup> 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.

<sup>32</sup> 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.

**Table 2. 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%
<b>Total</b>	<b>91</b>	<b>157</b>	<b>+66</b>	<b>+73%</b>

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

As can be seen in **Table 2**, 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.

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 3** compares the POR to FMAs 1 through 4.

**Table 3. 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
<b>Total</b>	<b>91</b>	<b>104</b>	<b>127</b>	<b>139</b>	<b>157</b>

**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 4** shows the POR and FMAs 1 through 4 in terms of their mission performance gaps.

**Table 4. 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 <sup>a</sup>	High	X	X			
Living Marine Resources (LMR) capability and capacity <sup>a</sup>	High	X	X			[all gaps addressed]
PWCS capacity <sup>b</sup>	Medium	X	X	X		
LMR capacity <sup>c</sup>	Medium	X	X	X		
Alien Migrant Interdiction Operations (AMIO) capacity <sup>d</sup>	Low/very low	X	X	X	X	
PWCS capacity <sup>e</sup>	Low/very low	X	X	X	X	

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

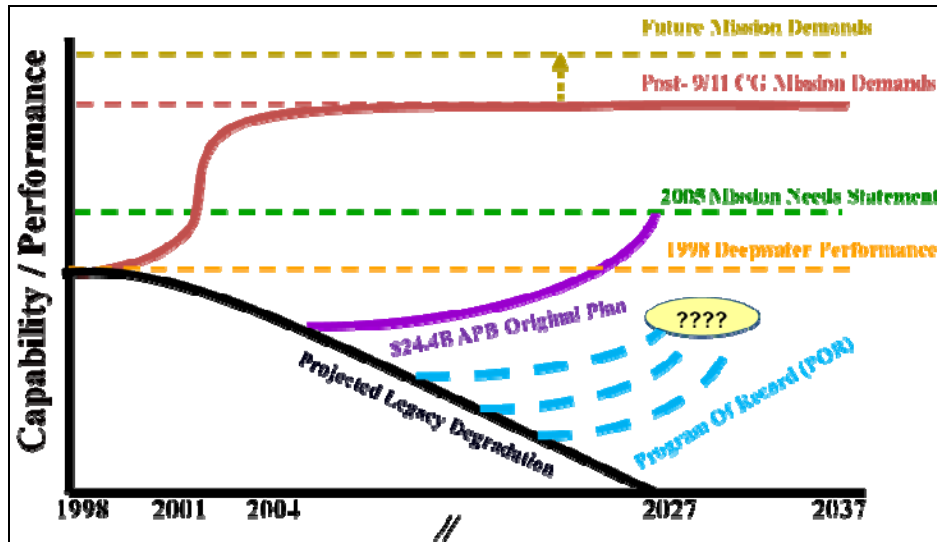
**Notes:** In the first column, The Coast Guard uses *capability* as a qualitative term, to refer to the kinds of missions that can be performed, and *capacity* as a quantitative term, to refer to how much (i.e., to what scale or volume) a mission can be performed.

- 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 4**, 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 4. 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 3** 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 3** 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.<sup>33</sup> GAO again presented them in a July 2011 report.<sup>34</sup>

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 5** compares the POR to the objective fleet mix from FMA Phase 1 and the refined objective mix from FMA Phase 2.

<sup>33</sup> 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.

<sup>34</sup> Government Accountability Office, *Coast Guard[:] Action Needed As Approved Deepwater Program Remains Unachievable*, GAO-11-743, July 2011, p. 46.

**Table 5. 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
<b>Total</b>	<b>91</b>	<b>157</b>	<b>149</b>

**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 5**, 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 3** and **Table 5** 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.<sup>35</sup>

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 3** and **Table 5** 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.<sup>36</sup>

<sup>35</sup> 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.

<sup>36</sup> 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.

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 4**? What impact would these performance gaps have on public safety, national security, and protection of living marine resources?
- How sensitive are these performance gaps to the way in which the Coast Guard translates its statutory missions into more precise statements of required mission performance?
- Given the performance gaps shown in **Table 4**, 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 4** 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 4**?

## 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 6** 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 roughly \$1 billion or \$1.1 billion per year.

**Table 6. Funding in AC&I Account in FY2013-FY2016 Budgets**

Millions of dollars, rounded to nearest tenth

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	Avg.
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
FY15 budget			1,084.2	1,103.0	1,128.9	1,180.4	1,228.7		1,145.0
FY16 budget				1,017.3	n/a	n/a	n/a	n/a	n/a

**Source:** Coast Guard FY2013-FY2016 budget submissions; “n/a” = 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.<sup>37</sup>

The Coast Guard has testified that funding the AC&I account at a level of about \$1 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 per year would leave about \$200 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.

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<sup>37</sup> 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.

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.<sup>38</sup>

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.<sup>39</sup>

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."<sup>40</sup>

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

<sup>38</sup> Source: Transcript of hearing.

<sup>39</sup> David Perera, "The Coast Guard Is Shrinking," *FierceHomelandSecurity.com*, April 18, 2012, accessed July 20, 2012, at <http://www.fiercephomelandsecurity.com/story/coast-guard-shrinking/2012-04-18>.

<sup>40</sup> 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.

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.<sup>41</sup>

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 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.<sup>42</sup>

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 trading water now but any further reductions, and now I am—I am beyond asking for help. We are taking on water.<sup>43</sup>

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

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<sup>41</sup> Transcript of hearing. The remarks were made in response to a question from Senator Mary Landrieu.

<sup>42</sup> Transcript of hearing.

<sup>43</sup> Transcript of hearing. The remarks were made in response to a question from Representative John Culberson.

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.<sup>44</sup> 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, this part of the AC&I account would be about \$1.8 billion per year.<sup>45</sup> 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.
- 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.<sup>46</sup> If Coast Guard funding for surface ship acquisition and sustainment were equivalent to 51% of Coast Guard funding for military pay and allowances, this part of the AC&I account would be about \$1.7 billion per year.<sup>47</sup> 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.

## Multiyear Procurement (MYP) and Block Buy Contracting

Another potential oversight issue for Congress concerns the potential for using multiyear contracting (i.e., multiyear procurement (MYP) or block buy contracting) in acquiring new cutters. With congressional approval, certain Department of Defense (DOD) programs for procuring ships, aircraft, and other items employ MYP or block buy contracting to reduce procurement costs. Compared to the standard or default approach of annual contracting, MYP and block buy contracting have the potential for reducing procurement costs by several percent.<sup>48</sup>

The statute that governs the use of MYP—10 U.S.C. 2306b—makes MYP available with congressional approval not only to DOD, but to other government departments, including DHS,

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<sup>44</sup> 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.

<sup>45</sup> The Navy's proposed FY2014 budget requests \$14,078 million for the Shipbuilding and Conversion, Navy (SCN) appropriation account.

<sup>46</sup> The Navy's proposed FY2014 budget requests \$27,824 million for the Military Personnel, Navy (MPN) appropriation account.

<sup>47</sup> The Coast Guard's proposed FY2014 budget requests \$3,425.3 million for military pay and allowances.

<sup>48</sup> For more on MYP and 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.

the parent department of the Coast Guard.<sup>49</sup> Congress also has the option of providing the Coast Guard with authority to use block buy contracting, as it has done for the Navy. All three of the Navy's year-to-year shipbuilding programs—the Virginia-class attack submarine program, the DDG-51 destroyer program, and the Littoral Combat Ship (LCS) program—currently use MYP or block buy contracting. In contrast, the Coast Guard has not used MYP or block buy contracting for any of its cutter procurement programs.

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.

Potential oversight questions for Congress include the following:

- Has the Coast Guard considered using MYP or block buy contracting for procuring NSCs, OPCs, or FRCs? If not, why not?
- What would be the potential savings of using MYP or block buy contracting for procuring the final two or three NSCs, for procuring OPCs, or for procuring FRCs?
- What are the potential risks or downsides of using MYP or block buy contracting for procuring NSCs, OPCs, or FRCs?

## OPC Program: FY2016 Funding Request

Another potential oversight issue for Congress concerns the FY2016 funding request for the OPC program. As shown in **Table 1**, the amount requested—\$18.5 million—is \$71.5 million less than the \$90 million that was projected for the OPC program for FY2016 under the FY2015 budget submission. As also noted earlier, the Coast Guard states, “The Administration’s [FY2016 budget] request includes a [proposed legislative] General Provision permitting a transfer [of additional funding] to the OPC project if the program is ready to award the next phase of vessel acquisition in FY 2016.” Potential oversight questions for Congress include the following:

- Why was the program’s FY2016 funding request reduced from the \$90 million projected under the FY2015 budget submission to \$18.5 million?
- Who will determine whether “the OPC project if the program is ready to award the next phase of vessel acquisition in FY 2016”? What criteria will be used to make this determination?
- If additional funding is not transferred to the OPC program, what effect will this have on the program’s schedule?

<sup>49</sup> 10 U.S.C. 2306b(b)(2)(B).



At a March 24, 2015, hearing on the Coast Guard's proposed FY2016 budget before the Homeland Security subcommittee of the House Appropriations Committee, the following exchange occurred:

REPRESENTATIVE JOHN CARTER, CHAIRMAN (continuing):

Now, I've got a question about this offshore patrol cutter situation. I told you in my opening remarks that it's going to be one of the largest, if not the largest, acquisition ever completed by DHS. Over \$130 million has been appropriated to the program since 2004, yet we will not see an operational [O]PC until 2021. I am confused by your (inaudible) support of the (inaudible) acquisition but there are no funding requests in the [FY]'16 budget. Why are there no funds requested for a PC [sic: OPC] in [FY]'16? Your acquisition plans indicates a contract award by late '16 -- FY '16. What would it impact if the contract award needed to be shifted to FY '17?

ADMIRAL PAUL ZUKUNFT, COMMANDANT, U.S. COAST GUARD:

So we have partial funding to do—do final construction and design work for the OPC. The work would actually begin following that. We're working very closely with the Department of Homeland Security to provide the offset that will be needed to do full design work for the offshore patrol cutter in [FY]2016. The underlying criteria is affordability. We have adhered to very stable requirements. I revisited those and—and I am convinced that—that we will be able to produce an affordable offshore patrol cutter using fixed priced contracting and we have three very highly incentivized contractors competing to get this largest contract in Coast Guard history.

CARTER:

So that's the reason there's no fund[ing] request in the [FY]'16 (inaudible).

ZUKUNFT:

No, sir. I requested full funding [for the OPC program]. I'm short about \$69 million to proceed forward with the final design of this. But, again, working very closely and with the great support of our secretary of Homeland Security to move this forward in [FY]2016. As you mentioned, I cannot afford to let this date lapse. I need relief ships for our 50-year-old ships today that will be 55-years-old by the time their relief arrives.<sup>50</sup>

A bit later in the hearing, the following exchange occurred:

REPRESENTATIVE LUCILLE ROYBAL-ALLARD, RANKING MEMBER:

The FY 2016 request for continued development of the offshore patrol cutter is \$18.5 million which is substantially below the planned spending level in the FY 2015 CIP [i.e., five-year Capital Investment Plan] which is the most recently CIP that we have. The budget request proposes new bill language that would provide unlimited authority to transfer funding to the Coast Guard for the OPC project. What can you tell us about the need for this new transfer authority and the likelihood that the department would actually use it? And if there is a reasonable expectation that more funding for the OPC will be needed, why not just include the funding in the request?

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<sup>50</sup> Transcript of hearing.

ZUKUNFT:

Yes, first and foremost, we have great support from the department and so that transfer authority would be imperative for us to be able to have full funding in [FY]2016 to be able to move this project forward. You will hear from our secretary two days from now, I believe, he is testifying as well and—and, clearly, counterterrorism in the homeland is always a highest priority for our Department of Homeland Security. But at the same time so is recapitalizing in the Coast Guard, in the offshore patrol cutter. I have a very open and frank dialogue with our secretary and I need to demonstrate to him that—that we can produce an affordable offshore patrol cutter and I remain confident that I will be able to do that. And, with that, the transfer authority would be very critical for us to meet this very important timeline short of an additional appropriation for full funding to move this project forward.<sup>51</sup>

## OPC Program: Cost, Design, and Acquisition Strategy

Another potential oversight issue for Congress concerns the Coast Guard's acquisition strategy for the Offshore Patrol Cutter. 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. 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?
- 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?

## 2012 Testimony

Some of the above questions have been discussed over the past two years at hearings on the Coast Guard's proposed FY2013 and FY2014 budgets. For example, at a March 6, 2012, hearing on the Coast Guard's proposed FY2013 budget before the Homeland Security Committee of the House Appropriations Committee, Admiral Robert J. Papp, the commandant of the Coast Guard, stated:

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<sup>51</sup> Transcript of hearing.

When I came in as commandant, I realized that this [the OPC program] was the most expensive project that the Coast Guard has ever taken on, honestly, as each [of the] 25 ships are a significant investment. And I also understood looking out at the horizon and seeing the storm clouds that restrict the budgets coming up there we needed to build a ship that was affordable.

We rescrubbed the requirements. We have battled ourselves within the Coast Guard to make sure we're asking for just exactly what we need, nothing more nothing less. And I have said three things to my staff as we go on forward—affordable, affordable, affordable.

And now I'm very pleased to say that just last week that the department [DHS] has reviewed—we passed a major milestone with acquisition decision event number two which validated our requirements for the type of cutter that we're looking for and we are ready to go towards the preliminary and contract design work this next year.<sup>52</sup>

Later in the hearing, the following exchange occurred:

ADERHOLT:

And there has been a discussion as to the capability of the OPC with objective design being more capable than the—than the threshold capability.<sup>53</sup> What is the current plan and capability of the OPC and what capability thresholds are you considering?

PAPP:

We—the driving one as I said is affordability, but having said that—and I'm not—I'm not trying to be funny here, but the—the sea-keeping capability being, you know, to operate in Sea State 5 is probably the most important to us right now because with fewer national security cutters, at least fewer than the hindrance posed that we have right now.

None of our medium endurance cutters—the 210 foot and 270 foot [medium-endurance] cutters that we have—can operate in the Gulf of Alaska and the Bering Sea and they do not have the long legs to be able to send them out in the—on some of the longer deployments that we do in the Pacific.

So it has to be able to launch the aircraft and boats in Sea State 5, you know, which is standard offset in the Bering Sea and also have endurance that we'll be able to keep it out there on station. And I believe it was 45 days [of operation at sea] we're looking for without refueling.<sup>54</sup>

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<sup>52</sup> Source: Transcript of hearing.

<sup>53</sup> In the design of many U.S. weapon systems, *threshold* refers to a minimally acceptable level of capability, and *objective* refers to a higher (but also more expensive or technically challenging) level of capability.

<sup>54</sup> Source: Transcript of hearing. At a March 7, 2012, hearing on the proposed FY2013 budgets for the Coast Guard and maritime transportation programs before the Coast Guard and Maritime Transportation subcommittee of the House Transportation and Infrastructure Committee, the following similar exchange occurred:

REPRESANTATIVE LARSEN:

Admiral Papp, some questions about the offshore patrol cutter. Obviously, we're—we're a little bit (inaudible) before that's operational. And I have a question about whether or not the requirements for the OPC will prioritize one set of factors over a different set of factors. (inaudible) and Endurance, that might be more helpful in the Pacific versus speed, armament, and other requirements. How are you approaching the requirement—setting requirements to the OPC?

PAPP:

(continued...)

## 2013 Testimony

At an April 16, 2013, hearing before the Coast Guard and Maritime Transportation subcommittee of the House Transportation and Infrastructure Committee on the FY2014 budget for the Coast Guard and maritime transportation, the following exchange occurred:

REPRESENTATIVE DON YOUNG: Admiral, I understand this morning you told the corporation you're going to reconsider the requirement for the Offshore Patrol Cutter and reopen the design competition; if that is correct, how long will this delay construction of much of the needy cutters, I mean, how long was—what will happen?

ARMIRAL ROBERT PAPP, COMMANDANT OF THE COAST GUARD: Sir, that wasn't quite an accurate report, I said that we remain committed to the Offshore Patrol Cutter and I was asked if the ability to operate in Sea State-5 was hard and fast and I said the highest requirement for the Offshore Patrol Cutter is affordability and as we evaluate the candidate vessels we may need to go back and look at some of the requirements, I'm hopeful that we don't have to.

I think we hammered off these requirements, in fact reduce some of them when I came in as (inaudible) [sic: Commandant?] because I want to make sure this ship is affordable and I've reported to this subcommittee and other sub-committees that we are intent on making this an affordable ship for the Coast Guard.

If we had opened it up to revise the sea-keeping capability there probably would be a delay but I have no intent to open that up at this point, we'd have to evaluate all the candidates that we have and I'm hopeful that we'll find three candidates that look affordable because we're going to need to operate this ship in Alaska and it's going to need to be able to launch and recover boats and aircraft while operating the barring sea.<sup>55</sup>

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(...continued)

Sir, realizing that this is going to be the largest acquisition project that the Coast Guard has ever done and recognizing that these ships are going to last us 40 years, we're taking the law beyond this [sic: a long look at this?]. And I realize there are some people that feel like we have dragged our feet a little bit or pushed this to the right a little bit, and I would say that's just not the case. It is a little delayed from where we started out.

But when I came in as commandant, I realized that we were going to be facing constrained budgets. So I had the staff take a look at the OPC once again, scrub the requirements with a direction that the primary requirement is affordability. We just could not afford everything that was in the requirements before, so we set new thresholds for it.

But the most important is the sea-keeping capability because with a reduced number of national security cutters, if we only have eight national security cutters replacing the 12 Hamilton class cutters, we have to have a ship that's capable of going up into the Gulf of Alaska, the Bering Sea, the Western Pacific.

Our medium endurance cutters right now, and speaking as a captain of a 270-foot cutter, we cannot—those ships cannot perform in the extreme weather conditions that you find sometimes in the North Atlantic much less the Arctic, and the—the Bering Sea.

So keeping the requirements for sea state five for helicopter launching and boat launching, and the Endurance were most important. And I'm really pleased to say that we have finally passed that hurdle. We went through acquisition decision event number two with the Department of Homeland Security last week, and they approved our requirements so we're—we're stepping out smartly now, moving ahead.

(Transcript of hearing)

<sup>55</sup> Transcript of hearing.

Similarly, at an April 16, 2013, hearing on the Coast Guard’s proposed FY2014 budget before the Homeland Security subcommittee of the House Appropriations Committee, the following exchange occurred:

REPRESENTATIVE (UNKNOWN):<sup>56</sup> Thank you, Mr. Chairman. Admiral, there’s been much discussion as to the capability of the OPC specifically the requirement to operate at sea state 5. Admiral, why is this requirement important? And if the current proposals come in too high, will you decrease the sea state requirement in order to meet the target price?

ADMIRAL PAPP: I would not like to do that because that would probably delay the process, but we may have to recomplete the request for proposals by changing that standard. The reason we need the standard is because we'll have only eight National Security Cutters and while they are tremendously capable ships, they can't be in the same places as 12 high endurance cutters were that they are replacing.

We've been comfortable with 12 high endurance cutters because that gave us enough to operate in the Bering Sea and in the Gulf of Alaska and the broad ranges of the—of the Pacific given the fact that we'll have fewer ships, in fact, we'll only have six National Security Cutters out on the West Coast because we need to keep two on the East Coast. We need to make sure that the offshore patrol cutters are capable of operating in Alaska.

The 270-foot medium endurance cutters that we have were originally intended to be able to operate everywhere. We've tried to operate them in Alaska. You can't launch and recover boats and you can't launch and recover aircraft. They just aren't—cannot survive the sea state up there. And that is our—that is our world of work. We have to be able to launch boats for our boarding teams to go aboard fishing vessels. We need to be able to launch helicopters for search and rescue.

So this requirement for sea state 5 has been our highest priority on that ship. I'm sorry. It's not been the highest priority. The highest priority has been affordability. And when people have asked me what are the three most important things about the offshore patrol cutter, I've constantly said, affordability, affordability, affordability. So that will be the driving factor on our down select for these three candidates and I'm hopeful that all three will not only be affordable but be able to survive in sea state 5—I'm sorry, not survive, but operate in sea state 5.<sup>57</sup>

## September 2012 GAO Report

Regarding the Coast Guard’s requirements development process for the OPC, a September 2012 GAO report states:

### **Coast Guard Took Positive Steps to Improve Requirements Development and Consider Affordability for the Offshore Patrol Cutter**

The Coast Guard took some steps to improve the requirements development process for the Offshore Patrol Cutter—the largest acquisition in DHS’s acquisitions portfolio and, according to officials, the first acquisition in the Deepwater surface fleet in which the Coast Guard had complete control over the requirements development process. The Coast Guard undertook studies and analysis that, in part, considered the measurability and testability as

<sup>56</sup> The transcript of the hearing shows the speaker as “unknown.”

<sup>57</sup> Transcript of hearing.

required by guidance of the following four key performance parameters: operating range, operational sustainment and crew, speed, and patrol endurance. For example, the range requirement, which is the distance the cutter can travel between refueling, is clearly stated as a minimum acceptable requirement of 8,500 nautical miles at a constant speed of 14 knots to a maximum level of 9,500 nautical miles. Although cutters typically transit at various speeds over the course of a patrol, the Coast Guard conducted analysis to determine that the 14 knots speed at the minimum and maximum ranges would provide enough days between refueling given the percentage of time that the Coast Guard normally operates at certain speeds. By developing a measurable range requirement, the Coast Guard helped to promote a clear understanding of Offshore Patrol Cutter performance by potential shipbuilders and sought to balance the cost of additional range with the value that it provides. Furthermore, officials at the independent test authority—the Navy’s Commander Operational Test and Evaluation Force—told us that they have been actively involved through the requirements development process and many of their questions regarding testability have been resolved.

Two other key performance parameters—seakeeping and interoperability—are not as consistent with the Coast Guard’s guidelines of measurability and testability as identified in the Major Systems Acquisition Manual. For example the seakeeping key performance parameter described in the requirements document states that the Offshore Patrol Cutter shall be able to launch small boats and helicopters in 8.2- to 13.1-foot waves. However, in the specifications document, which is used to translate the requirements document into a level of detail from which contractors can develop a reasonably priced proposal, the Coast Guard states that the Offshore Patrol Cutter shall be able to launch small boats and helicopters in no more than 10.7 foot waves while transiting in a direction that minimizes the pitch and roll of the vessel—an important detail not specified in the requirements document. Further, the interoperability key performance parameter states that the Coast Guard must be able to exchange voice, video, and data with the Department of Defense and Homeland Security agencies. However, it does not list specific external partners or substantial details regarding the systems required to exchange data and the types and size of these data that could be examples of measurability and testability. This key performance parameter does not make this distinction between parts of the military that the Coast Guard operates with most often, such as the U.S. Navy and the intelligence community, and simply requires interoperability with all of DOD. Similarly, the interoperability key performance parameter does not specify the DHS agencies for which the Coast Guard must exchange data with, which makes this parameter difficult to test. Coast Guard’s independent testing officials agreed that this key performance parameter, as currently written, is not testable in a meaningful way and stated that there are ongoing efforts to improve the clarity of this requirement.

During the requirements development process for the Offshore Patrol Cutter, the Coast Guard also made some decisions with respect to affordability. The following are examples where the Coast Guard made capability trades that are expected to help lower the program’s acquisition cost:

- **Speed**—after a series of analyses, the Coast Guard decided to reduce the minimum acceptable speed from 25 to 22 knots thereby, according to officials, potentially eliminating the need for two diesel engines. According to a study completed by the Coast Guard, this trade could reduce the acquisition cost of each cutter by \$10 million.
- **Stern Launch**—the Coast Guard removed the stern launch ramp capability from the Offshore Patrol Cutter design. While this trade-off may inhibit the launch and recovery of small boats in certain conditions, such as substantial roll or side-to-side movement of the vessel, Coast Guard officials stated that it will reduce the cost of the cutter because a stern launch ramp requires the cutter to be heavier, thus adding cost.

- C4ISR—the Coast Guard eliminated a minimum requirement for an integrated C4ISR system and instead is requiring a system built with interfaces to communicate between different software programs. According to Coast Guard officials, the Coast Guard now plans to use a Coast Guard-developed software system—Seawatch—rather than the more costly lead systems integrator-developed software system currently installed on the National Security Cutter, even though this system does not provide the Coast Guard with the capability to exchange near real-time battle data with DOD assets.

The improvements and affordability decisions that the Coast Guard has made in its requirements development process for the Offshore Patrol Cutter are even more evident when compared with the process for generating requirements for its other major cutter—the National Security Cutter. Due to the nature of the lead systems integrator strategy that the Coast Guard initially used to buy the National Security Cutter, Integrated Coast Guard Systems developed the requirements, designed, and began producing the National Security Cutter before the requirements document was completed. The Coast Guard did not have an operational requirements document at the time the Coast Guard awarded the construction contract for the first cutter in 2004, but the Coast Guard documented the requirements in 2006. Further, even as the third National Security Cutter was in production, Coast Guard was refining the requirements and, in January 2010, made the decision to clarify some key performance parameters such as anti-terrorism/force protection and underwater mine detection because the existing requirements were not testable. To further remedy the lack of clear requirements, Coast Guard officials stated that they are currently developing a second version of the requirements document that improves the specificity and definition of many of the National Security Cutter’s requirements and will be used as criteria during operational testing. To date, the Coast Guard has not reduced the National Security Cutter’s capability for the purpose of affordability as it has done for the Offshore Patrol Cutter. However, according to Coast Guard officials, there is a revised acquisition program baseline under review which will reflect an ongoing effort to lower the acquisition cost of the vessel.<sup>58</sup>

Regarding the potential accuracy of the Coast Guard’s estimated procurement cost for the OPC, given the known procurement cost of the NSC, the September 2012 GAO report states:

**Major Cutter Requirements and Missions Have Similarities, but Costs Vary Greatly and Concerns Remain about Affordability**

The requirements and missions for the National Security Cutter and the Offshore Patrol Cutter programs have similarities, but the actual cost for one National Security Cutter compared to the estimated cost of one Offshore Patrol Cutter varies greatly. Even though the Coast Guard took steps to consider affordability while developing the requirements for the Offshore Patrol Cutter, those affordability decisions do not explain the magnitude in the difference between these two costs....

This comparison raises questions whether the Offshore Patrol Cutter could be a less expensive, viable substitute for the National Security Cutter or whether there are assumptions built into the Offshore Patrol Cutter cost estimate, not related to requirements, which are driving the estimated costs down. With respect to the first, DHS, motivated by concerns about the affordability of the National Security Cutter program, completed a Cutter Study in August 2011 which included an analysis to examine the feasibility of varying the combination of objective—or optimal performing—Offshore Patrol Cutters and National Security Cutters in the program of record. Through this analysis, DHS found that defense

<sup>58</sup> Government Accountability Office, *Coast Guard[:] Portfolio Management Approach Needed to Improve Major Acquisition Outcomes*, GAO-12-918, September 2012, pp. 28-31.

operations is a key factor in determining the quantity of National Security Cutters needed and that the Coast Guard only needs 3.5 National Security Cutters per year to fully satisfy the planned requirement for defense-related missions. DHS concluded that with six National Security Cutters the Coast Guard can meet its goals for defense operations and mitigate some of the near-term capacity loss of the five National Security Cutter fleet modeled in the Cutter Study. DHS Program Analysis and Evaluation officials stated that this, in conjunction with other information, helped to inform the decision to not include the last two National Security Cutter hulls—hulls 7 and 8—in the fiscal years 2013-2017 capital investment plan. However, the DHS Cutter Study also notes that the time line for the two acquisitions makes a trade-off between the National Security Cutter and the Offshore Patrol Cutter difficult since the National Security Cutter program is in production whereas the Offshore Patrol Cutter program is only in the design phase. Similarly, we have reported that the Coast Guard may face an operational gap in its ability to perform missions using major cutters due to the condition of the legacy fleet.

With respect to the second possibility that there are assumptions built into the Offshore Patrol Cutter cost estimate that are driving the estimated costs down, the Coast Guard included three key assumptions in the Offshore Patrol Cutter's life cycle cost estimate, generally not related to the cutter's key requirements, which lower the estimated cost in comparison to the actual cost of the National Security Cutter. These three assumptions are:

- **Learning Curve.** The Coast Guard assumes that the shipyard(s) will generally continue to reduce the labor hours required to build the Offshore Patrol Cutter through the production of all 25 vessels. This may prove optimistic, particularly for later ships in the class, because the amount of additional learning per vessel—or efficiencies gained during production due to improving the manufacturing process to build the ship in a way that requires fewer labor hours—typically decreases over time in a shipbuilding program.
- **Military versus Commercial Standards.** The life cycle cost estimate assumes that certain areas of the Offshore Patrol Cutter's construction and material would reflect an average of 55 percent commercial standards—or construction standards that are typically used for military sealift ships that provide ocean transportation—and 45 percent military standards—or construction standards typically used for Navy combat vessels. Any changes in this assumption could have a significant effect on the cost estimate because military standards require more sophisticated construction applications, particularly in the areas of shock hardening and signature reduction, to prepare a ship to survive battle. Such sensitivity could help to explain the difference in costs between the Offshore Patrol Cutter program and the National Security Cutter program and officials stated that the latter program is being built to about 90 percent military standards.
- **Production Schedule.** The cost estimate reflects the Coast Guard's plan to switch from building one Offshore Patrol Cutter per year to building two Offshore Patrol Cutters per year beginning with the fourth and fifth vessel in the class. If the Coast Guard cannot achieve or maintain this build rate due to budget constraints, it may choose to stretch the schedule for the program which in turn could increase costs.

Coast Guard program officials generally agreed that these three variables are important to the cost of the Offshore Patrol Cutter and are key reasons why the Coast Guard expects one Offshore Patrol Cutter to cost less than half of one National Security Cutter. However, these officials recognized that the cost estimate for the Offshore Patrol Cutter is still uncertain since the cutter has yet to be designed—thus, the National Security Cutter's actual costs are more reliable. Coast Guard program officials also added that the cost estimate for the Offshore Patrol Cutter is optimistic in that it assumes that the cutter will be built in accordance with the current acquisition strategy and planned schedule. They noted that any



delays, design issues, or contract oversight problems—all of which were experienced during the purchase of the National Security Cutter—could increase the eventual price of the Offshore Patrol Cutter.<sup>59</sup>

## NSC Program: Preliminary and Operational Testing

Another potential oversight issue for Congress concerns the results of preliminary and operational testing of the NSC. A June 2014 GAO report stated:

The Coast Guard has some knowledge about the performance of the National Security Cutter, gained through operational deployments and preliminary test events, and the field portion of operational testing was recently conducted. The Coast Guard has been operating the vessel since 2008, conducted a preliminary operational test in 2011, and has received certifications to fully operate and maintain helicopters as well as, according to officials, to use the cutter's information technology systems on protected networks. In addition, Coast Guard program officials stated that the National Security Cutter has demonstrated most of its key performance parameters through a myriad of non-operational tests and assessments, but a few key performance parameters, such as those relating to the endurance of the vessel and its self-defense systems have yet to be assessed. Verification of an asset's ability prior to operational testing may be beneficial, but, as we have previously found, only operational testing can ensure that an asset is ready to meet its missions.

Prior to testing, the Coast Guard encountered several issues that require retrofits or design changes to meet mission needs based upon operations, certifications, and non-operational testing. The total cost of these changes is not yet known, but changes identified to date have totaled approximately \$140 million, about one-third of the production cost of a single National Security Cutter. The Coast Guard must pay for all of these and future changes due to the contract terms under which the first three ships were constructed and because the warranty on the remaining ships does not protect the Coast Guard against defects costing more than \$1 million. Table 4 lists the retrofits and design changes costing more than \$1 million. The table does not include all changes because the Coast Guard did not have data for some of the modifications. In addition to the \$140 million in identified changes, the Coast Guard has established a program to supply the National Security Cutter with cutter small boats for an additional \$52.1 million because the small boats originally planned to be delivered with the vessel did not meet requirements.

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<sup>59</sup> Government Accountability Office, *Coast Guard[:] Portfolio Management Approach Needed to Improve Major Acquisition Outcomes*, GAO-12-918, September 2012, pp. 31, 33-35.

**Table 4: Retrofits and Design Changes on the National Security Cutter Class Costing over \$1 Million as of December 2013**

Retrofits and design changes	Cost (in millions)
Primary information system replacement	\$88.5
Structural enhancements	to be determined <sup>a</sup>
Remove Aircraft Ship Integrated Secure and Traverse tracks in flight deck <sup>b</sup>	to be determined
Gantry crane that aids in launching small boats from stern ramp	\$31
Side davit crane for small boat operations	\$12.5
Two ammunition hoists	\$6.3
Breathing apparatus replacement	\$1.6
<b>Total cost</b>	<b>\$140<sup>c</sup></b>

Source: GAO presentation of Coast Guard data.

Notes: The Coast Guard reported these numbers for all eight hulls. However, for some items, such as the information system replacement, the costs primarily cover retrofitting some or all of the first four hulls.

<sup>a</sup>The work package is being developed and, according to program officials, initial estimates are about \$19 million per vessel.

<sup>b</sup>In January 2011, Coast Guard officials canceled the Aircraft Ship Integrated Secure and Traverse—a system intended to automate the procedure to land, lock down, and move the HH-65 helicopter from the deck to the hangar on the National Security Cutter—after significant deficiencies were identified during testing conducted by the U.S. Naval Air Warfare Center. The Coast Guard invested approximately \$27 million to install the system on three National Security Cutters, including putting tracks in the flight deck that must now be removed.

<sup>c</sup>Several funding accounts, including acquisition funding and operations and maintenance funding, are being used for these corrections.

Additional changes may be needed because the Coast Guard has not fully validated the capabilities of the National Security Cutter, though seven vessels have been delivered or are in production. This situation could result in the Coast Guard having to spend even more money in the future, beyond the current changes, to ensure the National Security Cutter fleet meets requirements and is logistically supportable. For example, the cutter is experiencing problems operating in all intended environments. The National Security Cutter requirements document states that the cutter will conduct assigned missions in a full spectrum of climate and maritime weather conditions, to include tropical, dry, temperate, and arctic climates. This document adds that although the National Security Cutter will operate in regions in which ice is frequently encountered, it will not have an ice-breaking mission. However, Coast Guard engineering reports from December 2012 discuss problems operating in both warm and cold climates. These reports discuss several warm weather problems, including cooling system failures, excessive condensation forming “considerable” puddles on the deck of the ship, and limited redundancy in its air conditioning system—which, among other things, prevents the use of information technology systems when the air conditioning system needs to be serviced or repaired. In addition, according to operational reports, during a recent deployment, the Commanding Officer of a National Security Cutter had to impose speed restrictions on the vessel because of engine overheating when the seawater temperature was greater than 77 degrees. Cold climate issues include the National Security Cutter not having heaters to keep oil and other fluids warm during operations in cold climates, such as the arctic. Further, Coast Guard operators state that operating near ice must be done with extreme caution since the ice can move quickly and can “spell disaster” if the National Security Cutter comes in contact with it. Senior Coast Guard officials acknowledged that there are issues to address and stated that the Coast Guard has not yet determined what, if any, fixes are necessary and that it depends on where the cutter ultimately operates....

The Coast Guard has also encountered several issues with the C4ISR [command and control, communications, computers, intelligence, surveillance, and reconnaissance] system that have required significant and costly changes, including replacing the original system. The original C4ISR system, which cost \$413 million to develop and field, was designed and built as a tightly integrated system bundling large commercial and government software programs with

contractor-proprietary software, which made it difficult and costly to maintain—primarily due to its unique characteristics and large size. For example, according to program officials, the Coast Guard relied on the contractor to conduct even basic system updates, which required new software code because of how the system was integrated.

As a result, in 2010, the Coast Guard began replacing the C4ISR software in two steps. First, to address immediate issues, the Coast Guard separated the weapons and command and control/navigation portions of the software but maintained the ability to share data between these portions of the system. Second, the Coast Guard has developed and is now installing a new software package that shares data between proven systems, which makes the system easier to maintain. For example, the communication/navigation system is largely based upon the Navy's Global Command and Control System, a long-standing system maintained by DOD. In addition, the combat system is adapted from the Navy's Aegis system. While the previous version of the C4ISR system also contained this software, the Coast Guard's new configuration keeps these systems independent to improve performance and maintenance, while still allowing data to be passed back and forth between the software packages within the system.

The Coast Guard has spent nearly \$2 million to develop this new system, called Seawatch, which will have to be further developed for each asset on which it is fielded. For example, it will cost an additional \$88.5 million in acquisition funds to purchase the software and hardware needed to field the system on the National Security Cutters.<sup>60</sup>

## FRC Program: Operational Testing

Another potential oversight issue for Congress concerns the results of operational testing of the FRC. A June 2014 report on Coast Guard acquisition programs states that

DHS approved the Fast Response Cutter and [the] HC-144 [maritime patrol aircraft] for full-rate production in September 2013 and October 2012, respectively. However, neither asset met all key requirements during initial operational testing. The Fast Response Cutter partially met one of six key requirements while the HC-144 met or partially met four of seven. The Fast Response Cutter was found to be operationally effective (with the exception of its cutter boat) though not operationally suitable, and the HC-144 was found to be operationally effective and suitable. As we have previously found for Department of Defense (DOD) programs, continuing with full-rate production before ensuring that assets meet key requirements risks replicating problems in each new asset until such problems are corrected. DHS officials stated that they approved both assets for full-rate production because the programs had plans in place to address most major issues identified during testing, such as supplying the Fast Response Cutter with a small boat developed for the National Security Cutter. However, DHS and Coast Guard acquisition guidance are not clear regarding when the minimum performance standards should be met, such as prior to entering full-rate production. For example, DHS and Coast Guard guidance provide that the Coast Guard should determine if the capability meets the established minimum performance standards, but do not specify when this determination should be made. By comparison, DOD acquisition guidance requires that specific minimum performance standards, which are defined at the time assets are approved for system development, be met prior to entering full-rate production.

<sup>60</sup> Government Accountability Office, *Coast Guard Acquisitions[:] Better Information on Performance and Funding Needed to Address Shortfalls*, GAO-14-450, June 2014, pp. 17-21.

In addition, DHS and Coast Guard acquisition guidance do not clearly specify how agency officials determine when a breach occurs and what triggers the need for a program manager to submit a performance breach memo. According to DHS and Coast Guard acquisition guidance, when programs fail to meet key performance parameters, program managers are required to file breach memorandums stating that the program did not demonstrate the required capability. Even though threshold key performance parameters on the HC-144 and Fast Response Cutter were not met during operational testing, the Coast Guard did not report that a breach had occurred. Acquisition guidance is unclear as to whether or not failing to meet key requirements during operational testing constitutes a breach. According to Coast Guard officials, if the Coast Guard plans to re-test or re-design a deficiency in order to meet the threshold value, then a breach has not yet occurred. For example, the Fast Response Cutter small boat did not meet the threshold seakeeping requirement, but a new cutter small boat has since been tested on its own and fielded to all Fast Response Cutters. The Coast Guard plans to test this new cutter small boat with the Fast Response Cutter during follow on testing. Program officials are confident that the cutter's new small boat meets this requirement and that—therefore—a breach has not occurred. DHS acquisition guidance specifies the performance criteria used to determine whether or not a breach has occurred, but does not identify a triggering event for determining when a breach occurs. DHS's Program Accountability and Risk Management officials stated that a program breach is not necessarily related to its performance during initial operational testing, which they state is a snapshot of a single asset's performance during a defined test period. Without clear acquisition guidance, it is difficult to determine when or by what measure an asset has breached the threshold values of its key performance parameters and—therefore—when to notify DHS and certain congressional committees....

COTF [Commander, Operational Test and Evaluation Force] determined in July 2013 that the Fast Response Cutter, without the cutter's small boat, is operationally effective—meaning that testers determined that the asset enables mission success. The cutter's small boat was determined to not be seaworthy in minimally acceptable sea conditions and—therefore—could not support the cutter's mission set. Further, COTF determined that the Fast Response Cutter is not operationally suitable because a key engine part failed, which lowered the amount of time the ship was available for missions to an unacceptable level. Despite the mixed test results, COTF and DHS testers as well as Coast Guard program officials all agree that the Fast Response Cutter is a capable vessel. Ultimately, COTF recommended that the Coast Guard proceed to field the vessel, but also recommended that the issues with the cutter's small boat be remedied expeditiously and that follow-on operational testing be conducted once corrective actions have been implemented. Since the test, the Coast Guard has delivered a new small boat that meets the Fast Response Cutter's needs and determined that the engine part failure was an isolated event.

The Navy also examined the extent to which the Fast Response Cutter meets key requirements. The test demonstrated that it partially met only one out of its six key requirements; the other five requirements did not meet minimum performance levels or were not tested. Table 2 displays each key performance parameter for the Fast Response Cutter, the test results, and a discussion of these results.

**Table 2: Key Performance Parameter Test Results for the Fast Response Cutter**

Key performance parameter (threshold requirement)	Was KPP tested?	KPP met?	Test result	Discussion
Top speed (28 knots)	No	N/A	N/A	Speed was not tested during initial operational testing due to a fuel oil leak. Speed has been assessed during preliminary acceptance trials and the vessel has reached top speed following the replacement of the original propeller. Since this change, all 9 FRCs have demonstrated at least 28 knots during other test events.
Fuel endurance (5 Days)	No	N/A	N/A	Not assessed due to inaccurate fuel level indicators.
Independent operations duration (5 days)	No	N/A	N/A	The Coast Guard's ability to independently operate the vessel was not tested. The cutter was still under warranty; thus, all maintenance was the responsibility of the shipbuilder at the time of the test.
Sea-keeping (conduct all operations in sea state 4)	Yes	No	The cutter small boat could not conduct operations in sea state 4.	Since the test, the Coast Guard has purchased new cutter small boats that are performing well according to crews. These boats have gone through their own testing and will be tested with the Fast Response Cutter during follow-on operational testing, which is scheduled to commence by the end of fiscal year 2015.
Interoperability (share information with internal and external partners)	Partial	Partial	Radios and some data transfers were successfully tested.	Communication with operational headquarters, intelligence units, external DHS, DOD and local assets, as well as other shore installations, were not tested.
Operational availability (85 percent)	Yes	No	47 percent	A key engine part failed during testing and it took 11 days to receive the part and conduct repairs, resulting in significant downtime during testing. Thus, the ship's availability to conduct missions during the test period was limited. Since testing was completed the FRC has experienced additional engine issues, including at least two generations of faulty cylinder head gaskets.

Source: GAO analysis of Navy and Coast Guard data.

The Coast Guard proactively sought to test the Fast Response Cutter early in the acquisition process, but early testing limited the ability to fully examine the vessel. For example, the Coast Guard did not test the top speed of the vessel due to a fuel oil leak. As noted above, DHS approved the Fast Response Cutter for full-rate production, but directed the program to develop corrections for the issues identified during operational testing and to verify those corrections through follow-on operational testing by the end of fiscal year 2015.<sup>61</sup>

## Legislative Activity for FY2016

### Summary of Appropriations Action on FY2016 Acquisition Funding Request

**Table 7** summarizes appropriations action on the Coast Guard's request for FY2016 acquisition funding for the NSC, OPC, and FRC programs.

<sup>61</sup> Ibid., pp. 13-16.

**Table 7. Summary of Appropriations Action on FY2016 Acquisition Funding Request**

Figures in millions of dollars, rounded to nearest tenth

<b>Request</b>	<b>Request</b>	<b>House Appropriations Committee</b>	<b>Senate Appropriations Committee</b>	<b>Final</b>
NSC program	91.4			
OPC program	18.5			
FRC program	340			
<b>TOTAL</b>	<b>449.9</b>			

**Source:** For request: Coast Guard FY2016 budget submission.

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