BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: COAST GUARD SEA, LAND, AND AIR CAPABILITIES, PART 2

(115–23)

HEARING

BEFORE THE

SUBCOMMITTEE ON
COAST GUARD AND MARITIME TRANSPORTATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

JULY 25, 2017

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July 21, 2017

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Coast Guard and Maritime Transportation
FROM: Staff, Subcommittee on Coast Guard and Maritime Transportation
RE: Hearing on "Building a 21st Century Infrastructure for America: Coast Guard Sea, Land and Air Capabilities, Part II"

PURPOSE

The Subcommittee on Coast Guard and Maritime Transportation will hold a hearing on Tuesday, July 25, 2017, at 10:00 a.m. in 2167 Rayburn House Office Building to examine the U.S. Coast Guard's (Coast Guard or Service) unfunded infrastructure and acquisition needs and the five-year and twenty-year Capital Improvement Plans. The hearing will also review the National Academy of Science's letter report, "Acquisition and Operation on Polar Icebreakers: Fulfilling the Nation's Needs." The Subcommittee will hear from the Coast Guard, the National Academy of Sciences (NAS), the Government Accountability Office (GAO), and the Congressional Research Service (CRS).

BACKGROUND

At the Subcommittee hearing on June 7, 2017, Vice Admiral Sandy Stosz, the Coast Guard's Deputy Commandant for Mission Support, stated that the Coast Guard would submit an unfunded priority list (UPL), five-year Capital Investment Plan (CIP), and 20-year Major Acquisition Plan to Congress by June 30, 2017. As she explained, in order to inform the UPL, the Coast Guard first needs to prepare the statutorily required CIP and 20-year Major Acquisition Plan. While Vice Admiral Stosz declared the Coast Guard would provide the three documents to Congress by June 30, 2017, to date only the UPL has been provided and that did not occur until July 20, 2017. In addition to examining the contents of that document, this hearing will examine why the Coast Guard has not yet submitted either the five-year CIP or the 20-year Major Acquisition Plan to Congress. This hearing will also offer the opportunity to receive objective acquisition and naval affairs input from GAO and CRS regarding ongoing and planned Coast Guard activities.

Five-Year Capital Investment Plan

Section 2902 of title 14, United States Code, requires the Commandant of the Coast Guard to submit a CIP to the Committee each year in conjunction with the administration's respective budget request. The CIP identifies projected funding levels over the next five fiscal years for each major acquisition, as well as estimated timelines and total costs to complete each such acquisition. The purpose of the CIP is to ensure Congress has adequate information to conduct proper oversight of the Service's capital budget, acquisition plans, mission needs, and readiness to conduct operations in future years.

The GAO has criticized Coast Guard CIPs for failing to accurately reflect cost and schedule impacts from funding shortfalls. The 2014 GAO report entitled *Better Information on Performance and Funding Needed to Address Shortfalls* (GAO-14-450), recommended that the Coast Guard be required to regularly update the estimated timelines and total costs to complete each acquisition based upon actual appropriations provided by Congress, as opposed to projected funding levels. The Coast Guard continues to under-deliver in these areas.

Year after year, the Coast Guard fails to submit the CIP with the annual budget request. Even when Congress withheld $85 million of operational funding until the CIP was received annually from fiscal year (FY) 2015 to FY 2017, the Coast Guard did not meet the deadline. In the FY 2017 Consolidated Appropriations Act, Congress directed the Service to submit the FY 2018-2022 CIP by June 30, 2017. Given the timing of the appropriation in relation to the fiscal year, no funding was withheld pending receipt of the CIP, as to not interfere with vital Coast Guard operations. During the Subcommittee hearing on June 7, 2017, Vice Admiral Sandy Stosz, the Coast Guard's Deputy Commandant for Mission Support, stated that the Subcommittee would receive the CIP by June 30, 2017. Nevertheless, the Coast Guard has failed to meet that deadline and, to date, has still not submitted this critical planning document. The Coast Guard has not provided the 5-year CIP as of July 21, 2017.

Long-Term Major Acquisitions Plan (20-Year Plan)

Section 2903 of title 14, United States Code, requires the Secretary of Homeland Security to submit a Major Acquisition Program Status Report, including a Long-Term Major Acquisition Plan, biennially in conjunction with the administration's respective budget request. The Major Acquisition Plan describes fleet planning for the next 20 fiscal years, including the cutters and aircraft to be decommissioned, those to be acquired, and the estimated funding level required in each fiscal year to do so, as well as addressing any identified capability gaps.

The GAO also recommended the Service develop a long-term fleet modernization plan that identifies all acquisitions needed to meet mission needs and the costs associated with such acquisitions over 20 years. The Major Acquisitions Plan is precisely the instrument described as critical to long-term planning and oversight.

Despite the importance of this information, and although the Coast Guard was required to submit the Status Report, including the Major Acquisition Plan, with the FY 2014, FY 2016, and FY 2018 budget requests, they did not submit any such information to Congress. During the Subcommittee hearing on June 7, 2017, Chairman Hunter directly asked the Coast Guard when

they expected to submit the Major Acquisitions Plan. As with the five-year CIP, Vice Admiral Stosz pledged that the Subcommittee would receive it by June 30, 2017. And also like the CIP, the Coast Guard has failed to meet that self-imposed deadline and, to date, has still not submitted a Major Acquisition Plan. As of July 21, 2017, the Coast Guard has not submitted the plan to Congress.

Unfunded Priority List

In addition to requiring submission of a five-year CIP, Section 2902 of title 14, United States Code, requires the Commandant to submit a UPL to the Committee each year in conjunction with the administration's respective budget request. The UPL identifies programs and mission requirements that are not funded in the administration's annual budget requests, are necessary to fulfill operational requirements, and which the Commandant would have recommended for inclusion in the proposed budget had additional resources been available. The purpose of the UPL is to ensure Congress has visibility of true Coast Guard needs and potential shortfalls to facilitate proper oversight of the Service's budget, acquisition plans, mission needs, and readiness to conduct operations in future years.

While a UPL was submitted with both the FY 2016 and FY 2017 budget requests, no such document was included with the FY 2018 request. Again, at the Subcommittee hearing on June 7, 2017, Chairman Hunter directly asked the Coast Guard when Congress would receive the UPL. As with the CIP and Major Acquisitions Plan, Vice Admiral Stosz pledged that the Subcommittee would receive it by June 30, 2017. While the Coast Guard did not meet that deadline, it did submit a UPL on July 20, 2017.

The 2018 UPL includes $1.986 billion of programs and mission requirements which are necessary to fulfill operational requirements but were left out of the proposed budget due to a lack of available resources. Those programs and mission requirements include over $1.5 billion to rebuild operational capability and $438 million for critical shore infrastructure projects. Notably, the UPL does not request funding for new Fast Response Cutters to replace aging patrol boats operating in support of United States Central Command as part of Patrol Forces Southwest Asia. The full UPL is included as an appendix.

National Academy of Sciences Committee Polar Icebreaker Cost Assessment

The Coast Guard's ongoing efforts to recapitalize its heavy icebreaking fleet includes recently establishing an Integrated Program Office with the Navy and awarding five fixed-price contracts for heavy polar icebreaker design studies and analysis. The FY 2017 Consolidated Appropriations Act provided $150 million (in the Navy's Shipbuilding and Conversion (SCN) account) in advance procurement funding to buy long-lead time material for the program's initial ship.

As required by Section 604 of the Coast Guard Authorization Act of 2016, the NAS submitted to the Committee an assessment of the costs incurred by the federal government to carry out polar icebreaking missions and how best to carry out this mission in the future. NAS offers several findings and recommendations:

1. **Finding:** The United Stated has insufficient assets to protect its interests, implement national policy, execute its laws, and meets its obligations in the Arctic and Antarctic because it lacks adequate icebreaking capability.

2. **Recommendation:** Congress should fund construction of four polar icebreakers of common design that would be owned and operated by the Coast Guard. This would provide three ships for continuous presence in the Arctic and one ship to provide seasonal presence in the Antarctic. All ships would be based on a common design and have similar maintenance costs. Additionally, government ownership would be less costly than leasing.

3. **Recommendation:** The Coast Guard should follow an acquisition strategy that includes block buy contracting with a fixed price incentive fee contract and take other measures to ensure best value for investment of public funds. It is important to complete planning and production detail design before the start of construction.

4. **Finding:** Coast Guard heavy icebreaker cost estimates are reasonable. However, previously identified costs of medium icebreakers are significantly underestimated. If advantage is taken of learning and quantity discounts available through the recommended block buy contracting acquisition strategy, the cost of a fourth heavy icebreaker ($692M) would be less than that of a first of class medium icebreaker ($786M).

5. **Finding:** Operating Costs of new polar icebreakers are expected to be lower than those of the vessels they replace due to:
   - Greater fuel efficiency (e.g., lower fuel consumption);
   - A well-designed automation plan will require fewer operation and maintenance personnel;
   - Less maintenance expected in the first 10 years;
   - Adoption of newer, more reliable technologies will allow for greater use of planned and condition-based maintenance; and
   - Use of consumer off-the-shelf technology and minimization of the use of military specifications will also reduce long-term costs.

6. **Recommendation**: The Coast Guard should ensure that the common polar icebreaker design is science-ready and that one of the ships has full science capability. An investment of $10M-$20M per ship to make each vessel science-ready will allow each to be retrofitted at a lower cost at a future date to accommodate science activities, if necessary. For an additional $20M-$30M investment, a ship could be made science capable by including baseline science equipment.

7. **Finding**: The Nation is at risk of losing its heavy polar icebreaking capability – experiencing a critical capacity gap – as the USCGC POLAR STAR approaches its extended service life, currently estimated at three to seven years.

8. **Recommendation**: The Coast Guard should keep the USCGC POLAR STAR operational by implementing an enhanced maintenance program until at least two new polar icebreakers are commissioned.

WITNESS LIST

Panel I

Admiral Paul F. Zukunft
Commandant
United States Coast Guard

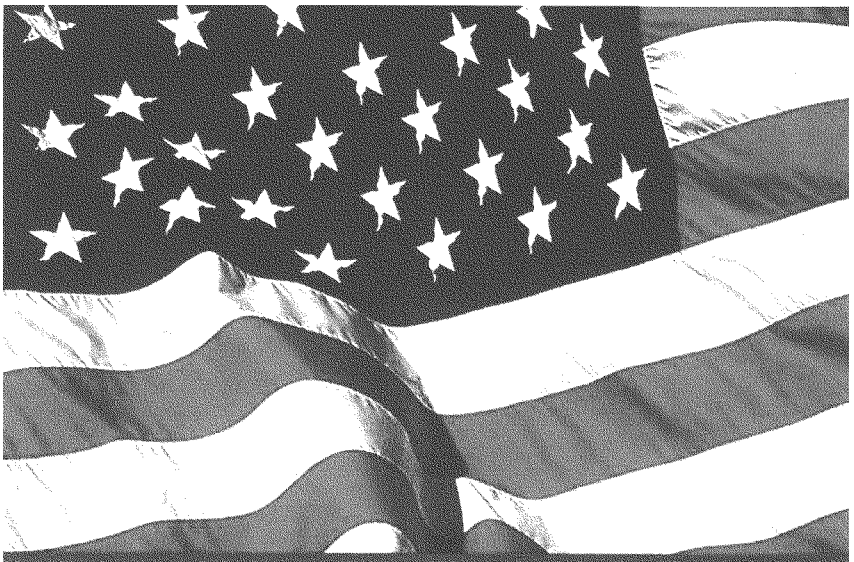
Panel II

Rear Admiral Michael J. Haycock
Assistant Commandant for Acquisition and Chief Acquisition Officer
United States Coast Guard

Ms. Marie A. Mak
Director of Acquisition and Sourcing Management
Government Accountability Office

Rear Admiral Richard D. West (Navy Ret.)
Chair
Committee on Polar Icebreaker Assessment
National Academy of Sciences

Mr. Ronald O'Rourke
Specialist in Naval Affairs
Congressional Research Service



Acquisition, Construction, and Improvements FY2018 Unfunded Priorities List

Submission to Congress

July 20, 2017

U. S. Coast Guard

Foreword

July 20, 2017

The following document, "Acquisition, Construction, and Improvements FY2018 Unfunded Priorities List," as prepared by the U.S. Coast Guard is submitted for review.

The *Coast Guard and Maritime Transportation Act of 2012* (Pub. L. No. 112-213) directs the submission of a list of unfunded acquisition, construction, and improvement priorities for the Coast Guard this year.

Pursuant to Congressional requirements, this document is being provided to the following members of Congress:

The Honorable John Thune
Chairman, Senate Committee on Commerce, Science, and Transportation

The Honorable Bill Nelson
Ranking Member, Senate Committee on Commerce, Science, and Transportation

The Honorable Bill Shuster
Chairman, House Committee on Transportation and Infrastructure

The Honorable Peter DeFazio
Ranking Member, House Committee on Transportation and Infrastructure

I am happy to answer any further questions you may have, or your staff may contact my Senate Liaison Office at (202) 224-2913 or House Liaison Office at (202) 225-4775.

Sincerely,

Paul F. Zukunft
Admiral, U. S. Coast Guard
Commandant

Acquisition, Construction, and Improvements
FY2018 Unfunded Priorities List

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I. Legislative Language

This document responds to the language set forth in the *Coast Guard and Maritime Transportation Act of 2012* (Pub. L. No. 112-213), which states:

SEC. 213.

On the date on which the President submits to Congress a budget pursuant to section 1105 of title 31, the Commandant of the Coast Guard shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate— a list of each unfunded priority for the Coast Guard.

''(b) UNFUNDED PRIORITY DEFINED.—In this section, the term 'unfunded priority' means a program or mission requirement that—

''(1) has not been selected for funding in the applicable proposed budget;

''(2) is necessary to fulfill a requirement associated with an operational need; and

''(3) the Commandant would have recommended for inclusion in the applicable proposed budget had additional resources been available or had the requirement emerged before the budget was submitted.''.

II. Acquisition, Construction, and Improvements FY2018 Unfunded Priorities List

Project Name	Funding ($K)	Project Description
Rebuilding Operational Capability		
Heavy Polar Icebreaker	$750,000	Additional funding in FY18 supports construction of the first Heavy Polar Icebreaker and maintains the current strategy to stay on schedule, and maybe even accelerate the acquisition further.
National Security Cutter #9 Follow-On Acquisition Funding	$125,000	Follow-on acquisition needs for National Security Cutter (NSC) #9, including: Post-Delivery Activities (PDA); testing, evaluation, and support activities; cutter boats; and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR).
MH-60T SLEP Partial Hull Conversions	$12,000	Partially converts three MH-60T hulls to use during the SLEP production line to prevent an operational gap while the SLEP is occurring.
MH-60T Full Hull Conversions	$36,000	Converts three SH-60 U.S. Navy hulls to operational MH-60T Coast Guard airframes. These additional airframes could be used to transition Air Station Borinquen from MH-65s to MH-60Ts for greater border security capabilities.
HC-130J	$400,000	Provides funding to purchase four missionized C-130Js and keeps the CG on track to attain the program of record of 22 airframes.
C-27J Flight Simulator	$25,000	Purchases a used flight simulator to provide training to pilots and assist with correcting proficiency concerns at Air Station Sacramento.
Two Fast Response Cutters	$100,000	The current request contains four FRCs. Additional funding could exercise the option for six hulls in FY18 and reduce per unit costs while working towards the program of record of 58 hulls.
Inland Waterways and Western Rivers Tender	$5,000	Based on initial market research and relatively low complexity of design, there may be an opportunity to mature preliminary designs from the ACOE Marine Design Center while simultaneously developing acquisition documentation. The Coast Guard could use additional funds to begin the process of accelerating the acquisition in FY18.
Land-based UAS	$5,000	The Coast Guard currently operates MQ-9 Predators through the UAS Joint Program Office established with CBP. The logical next step for the joint DHS program is to expand the UAS footprint and focus operations in the source and transit zones to counter transnational criminal organizations that smuggle illicit contraband to U.S. shores.

Project Name	Funding ($K)	Project Description
Enterprise Mission Platform	$20,000	Funds significant upgrades and improvements to existing C4IT systems; possible projects include Marine Information for Safety and Law Enforcement (MISLE), Global Command and Control System (GCCS), and Unified Capabilities and Enterprise Voice Over Internet Protocol (VoIP).
Long Range Command and Control Aircraft	$70,000	Recapitalizes a Long Range Command and Control Aircraft (currently being leased) to support continued operations and travel for Coast Guard and Department of Homeland Security senior leadership.
Subtotal: Rebuilding Operational Capability	***$1,548,000***	

Project Name	Funding ($K)	Project Description
Shore Construction		
Various Locations – Hurricane Matthew Facility Damage	$77,600	Recapitalize waterfront facilities, station buildings, unaccompanied personnel housing, and storm drainage in Tybee, GA; Port Canaveral, FL; Jacksonville, FL; Ponce de Leon, FL; Wilmington, NC; Fort Macon, NC; Hatteras, NC; Elizabeth City, NC; and Portsmouth, VA. The FY17 Appropriation provided $15 million to address the most critical needs.
National Security Cutter #9 Homeport	$23,000	Follow-on acquisition needs for National Security Cutter (NSC) #9 Major Acquisition Systems Infrastructure (MASI), based on homeporting in Charleston, South Carolina.
Boat Haulout Pier – Station Tillamook Bay	$22,340	Replacement of the haulout pier and boat haulout system at Station Tillamook Bay, an outdated system that was installed in 1982.
Station Building – Station Key West	$15,300	Construct new multi-purpose building to replace existing Station building to support Station Operations and correct existing condition and space deficiencies.
Sector Facilities – Sector Honolulu	$35,190	Recapitalize Sector facilities to support operations and correct existing condition and space deficiencies.
Relocate Marine Safety Unit Morgan City	$3,200	Provides for build-out of leased facility to support unit operations and address existing issues related to condition and space.

Project Name	Funding ($K)	Project Description
Realign Aids to Navigation – Grays Harbor, WA	$1,125	Relocates North Channel and Hoquiam Reach Ranges, Point Chehalis Range and Aberdeen Range Rear Light to account for channel realignment by US Army Corps of Engineers.
Station Facilities – Station South Padre Island	$25,500	Construct new facilities to replace existing Station and Unaccompanied Personnel Housing to support operations and correct existing condition and space deficiencies.
Sector Facilities – Sector Buffalo	$25,400	Recapitalize Sector facilities to support operations, correct existing condition and space deficiencies, and provide sufficient personnel and visitor parking.
Waterfront Facilities – Cleveland	$13,260	Recapitalize waterfront bulkhead in support of CGC NEAH BAY, CGC MORRO BAY, and Station Cleveland.
Sector Facilities – Sector Sault Ste Marie	$22,750	Recapitalize Sector facilities to support operations and correct existing condition and space deficiencies.
Barracks Renovation – Coast Guard Academy	$25,527	Renovates Chase Hall Annex C by providing comprehensive life safety upgrades, including fire protection. Corrects utilities deficiencies and provides habitability updates to extend the building's service life.
Barracks Renovation (Phase 1) – TRACEN Cape May	$30,000	Recapitalize Training Center barracks for 3 recruit companies to accommodate both genders, including providing classroom space and administrative support space.
Utility Upgrades – Air Station Ventura	$5,000	Utility upgrades at Naval Base Ventura County, Point Mugu, CA to support a new Coast Guard Air Station hangar.
Security Gate – Sector Delaware Bay	$2,800	Recapitalize damaged facility security gate and associated controls to maintain effective entry point control.
Travel Lift Piers – TRACEN Cape May	$2,600	Recapitalize travel lift piers (currently beyond useful service life) to meet sufficient load capacity; supports boat maintenance at TRACEN Cape May.
Boat Ramp – Station Annapolis	$3,000	Recapitalize the boat ramp at Station Annapolis, which is currently beyond its useful service life.
Land Acquisition – Sector Detroit	$3,000	Acquire real property necessary to complete follow-on project that provides Final Operating Capability facilities at Sector Detroit.

Project Name	Funding ($K)	Project Description
Pier Improvements – Base Honolulu	$5,200	Recapitalize 100' of pier to increase load capacity and provide maximum flexibility for performance of cutter maintenance activities.
Realign Aids to Navigation – Delaware River	$14,530	Realign Aids to Navigation in/approaching the Delaware River to accommodate latest Army Corps of Engineer dredging and realignment of channel (New Castle, Liston Reedy, Fisher Point Ranges).
Consolidation of Air Station & Station – Elizabeth City, NC	$60,280	Consolidate the Air Station and Boat Station facilities to create efficiencies, while recapitalizing the aging infrastructure.
Rebuild Aids to Navigation – Columbia River	$2,000	Replace 50 year old failing wooden fixed aids to navigation with steel fixed aids to navigation.
Long Beach Harbor Light	$1,500	Recapitalize Long Beach Harbor Light; replace infrastructure and light.
Child Development Center – TRACEN Petaluma	$15,400	Construct a new Child Development Center at TRACEN Petaluma to replace modular facilities and meet current life safety requirements, including utilities and storm water management.
Oil-Water Separator System – Elizabeth City, NC	$2,625	Construct an Oil-Water Separator System at Elizabeth City to prevent the introduction of oil into the storm drainage system.
Subtotal: Shore Construction	***$438,127***	
Total:	**$1,986,127**	

BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: COAST GUARD SEA, LAND, AND AIR CAPABILITIES, PART 2

TUESDAY, JULY 25, 2017

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COAST GUARD AND MARITIME TRANSPORTATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:08 a.m. in room 2167 Rayburn House Office Building, Hon. Duncan Hunter (Chairman of the subcommittee) presiding.

Mr. HUNTER. The subcommittee will come to order. Thanks for being here today, Commandant. It is just you right now, this is good.

The subcommittee is meeting today to pick up from where we left off from our June 7th hearing on Coast Guard infrastructure. An important aspect of the previous hearing was the Coast Guard stating it would submit its unfunded priorities list with a 5-year Capital Investment Plan and a long-term major acquisition plan to the committee.

Unfortunately, as of today's hearing, we only have received the unfunded priorities list and a chart from the 5-year Capital Investment Plan. But at least it is something.

Members of this subcommittee are some of the strongest supporters of the Coast Guard with a number of us also serving on the Armed Services Committee, which allows us to push for Coast Guard priorities in parity with the other Armed Forces. It can be frustrating and difficult to advocate for Service priorities and funding needs when we lack specific Coast Guard documents that can best inform congressional decisions on Coast Guard acquisition programs.

With its aging fleet of cutters and aircraft, the Coast Guard has implemented extensive maintenance and life-extension projects for its assets in order to do more with less capable assets. In addition, new assets such as the National Security Cutters and the Fast Response Cutters have experienced ongoing issues which reduce their capabilities and further exacerbate the Service's ability to conduct its missions.

It is very likely that the Coast Guard assets will reach the end of their service life before replacements are in place. The threat of mission gaps is a very real possibility. The Service will continue to tell us otherwise, and present charts that show less substantial

gaps, but I still believe the Service charts are based on wishful thinking, not fiscal reality. And we will represent that with a slide here once the hearing really begins.

While it hasn't been the fault of the U.S. Coast Guard that severe budgets have curtailed or delayed acquisition programs, the Service can be faulted for a lack of detail on the impacts of a stagnant budget on acquisition programs, and subsequently on its ability to carry out its missions. The fact that the mission needs statement, a 5-year Capital Investment Plan, and the fleet mix analysis do not fully tell the story of the Coast Guard's short-term and long-term gaps or its plan to address them has been an ongoing concern.

GAO [U.S. Government Accountability Office] has pointed out in a number of reports that the Coast Guard should develop a long-term plan to influence its short-term planning documents. In 2016, Congress required the development of the 20-year major acquisition plan since it was clear the Service was not going to do one on its own. However, it has been a year and a half since the requirement was enacted into law and we still have not received a long-term plan from the Coast Guard.

How important is long-term planning to the Coast Guard? I really can't say. We on the committee believe long-term planning documents can assist the Coast Guard in getting its acquisition programs funded. It is disappointing that we only have the unfunded priorities list to discuss today without the 5-year and 20-year planning documents that should fill in the blanks and provide a roadmap for the future. It is hard to understand any of these documents by themselves because they are not in context; there is no perspective without a 20-year plan.

Regardless, we will continue to have these important discussions with the Service. I look forward to hearing from our witness today on how we can best address the Coast Guard's infrastructure needs.

I will now yield to Ranking Member Garamendi. You are recognized.

Mr. GARAMENDI. You were going to go to DeFazio first.

Mr. HUNTER. For an opening statement. To you and then——

Mr. GARAMENDI. Thank you, Mr. Chairman. Good morning, Admiral, welcome. We are delighted that you are with us. We do have some questions.

I felt that our priority hearing on this topic in early June laid out the groundwork for future substantive discussions, and it was my expectation that that would happen today. I am not at all sure, however.

It is manifestly frustrating, again, to not have the Coast Guard provide the committee with the capital planning and budget information the Coast Guard is required by statute to provide to this committee. And make no mistake about it, this committee is deprived of critical information when both the 5-year and 20-year Capital Investment Plans are not forthcoming.

I do notice that something at 5:47 was delivered to us yesterday. The absence of these documents makes it difficult, if not impossible, to understand and appreciate the budget tradeoffs among the acquisition programs. Moreover, this gap in information compromises our ability to flag programs that have gone off-budget or

to ensure that taxpayer dollars are invested as wisely as possible to maintain Coast Guard mission readiness and capability.

As I mentioned in my remarks at the June 7th hearing, the Coast Guard has an enduring role in protecting our shores and in facilitating our maritime commerce. When we talk about ensuring the future prosperity and security of our Nation, few things are as important as providing the Coast Guard with the equipment it needs.

When this subcommittee is not provided essential information to fully understand the complexities of these expensive and important procurements, however, it makes it that much more difficult for the members of the subcommittee to advocate and build greater support in Congress for the Coast Guard's budget.

Trying to understand a document that was delivered late yesterday that I saw for the first time this morning when I arrived here, for example, the polar icebreaker. Hmm, $19 million and $18 million—or is it $5 million—$50 million—$150 million, $430 million and then $300 million, that is maybe one icebreaker. What about the other three or the other two or other five?

We cannot do our work without good information, Admiral, and we don't have it. And so, I guess I am resigned to having to lower my expectations for the future of the Coast Guard. I don't want to do that, but you don't leave me much option.

It is a missed opportunity. We have to make decisions very soon about the Federal budget for 2018. The appropriations are on the floor maybe today for the Homeland Security Department. And this is the information we have available to us. To the extent, Admiral, that you and Admiral Haycock can fill in the blanks today, would you please do so?

As to our other witnesses, welcome. I look forward to your testimony on these important matters, and let's hope that we are not further disappointed. I yield back.

Mr. HUNTER. I thank the gentleman. I'm going to go out of order here and recognize the ranking member of the full committee, because we are blessed to have him here in this hearing. Mr. DeFazio is recognized.

Mr. DEFAZIO. Thanks, Mr. Chairman. I would certainly endorse remarks of my colleague, the ranking member, Mr. Garamendi. I think it was 4 or 5 years ago when we were doing a Coast Guard budget hearing I asked your predecessor, "This is it?"

I mean at that point you didn't even list the icebreakers on there. And having been on the icebreaker and having known, you know, the fact that one was mothballed and the other one is, you know, basically limping along, I was surprised and I said, "I hope that next year you will bring in a more complete list of your needs."

I know there is a lot of pressure from the trolls at OMB [Office of Management and Budget] or others in the administration, but if you don't advocate for the Service, we can't advocate for the Service. And at some point we have got to break this logjam, you know, and I don't know where—I don't think it's within the Service that there is this reluctance. I don't know exactly where the problem lies. But we need the information.

And as Mr. Garamendi pointed out, I mean, it is very puzzling that we finally got the polar icebreaker on the list, but it looks like

maybe, as he said, perhaps one and, you know, obviously you have many, many, many other needs that are not reflected on this 1-page summary. So we really need—and later, when we are in questions I will be asking, if others don't, when we are going to get the 5-year, when we are going to get the 20-year.

I also intend to follow up on the questions that I raised regarding the closure of the Potomac River. This is a fairly unique situation. We have individual disbursed recreation, some of it commercial, some of it—much of it commercial, rented, but some of it guided. You have a camp for—a youth camp, right, that would be affected because they use that section of river?

And this is not your normal maritime situation, where people have marine radios and that. I do note in your letter that you say that individuals can apply to the captain of the port and get individual authorization. That would be people in inner tubes, I guess, and I am not sure how that would work. I guess they—you know, maybe they can call in on their cell phone, or something like that.

But, you know, I just don't see—I know the Secret Service is always difficult to deal with, but I think you could assure security without a total intermittent and unpredictable closure because you are going to strand people. I mean if someone is—if, as I pointed out, the President could play on his other 18-hole course where he didn't—where it wasn't next to the river, where he didn't cut down all the trees, and that could satisfy his need to play golf on his own properties to promote his own interests, as opposed to going somewhere else that is more secure.

But, you know, to totally close this river, you are going to have people floating along in inner tubes, drinking beer, coming up against security, and then they have to get miles down the river to their pickup point, and I guess they are going to be sitting there drinking beer while someone plays 18 holes of golf, the President or other undesignated important individuals.

So this is something that is going to require some pushback, I think, with the Secret Service, where the Coast Guard says this is not practical for this sort of recreational activity. You could post a Zodiac there with a machine gun, and if you see a threatening paddleboarder, take him out. So, you know, that would—that might solve the problem. So I will be asking questions about that also. Thank you, Mr. Chairman.

Mr. HUNTER. I thank the gentleman.

Admiral, again, thank you for being here, and for your long service. And you are now recognized.

TESTIMONY OF ADMIRAL PAUL F. ZUKUNFT, COMMANDANT, U.S. COAST GUARD

Admiral ZUKUNFT. Chairman, thank you, and Ranking Member Garamendi, Ranking Member DeFazio, and members of this committee, staff, thank you for giving me this opportunity to testify today.

I do ask that my written statement be entered into the record.

Mr. HUNTER. Without objection.

Admiral ZUKUNFT. OK. As this committee well knows, the Coast Guard is a longstanding member of the armed services. We have served in every military campaign dating back to 1790. Today,

there are over 20 Coast Guard cutters committed to supporting DoD's global operations, chopped to DoD.

And on any given day there are 5 aircraft, 2 specialized boarding teams, and an all-Reserve 130-member Port Security Unit under the operational command of our DoD combatant commanders. I mention this to bring to your attention the Coast Guard's national security and defense missions are paramount. These are Coast Guard platforms and forces performing defense missions that are largely trained, equipped, maintained, and salaried as part of the Coast Guard's budget, not part of Department of Defense.

Yet, as a military service, only 4 percent of my budget is funded through defense appropriation discretionary appropriations. The other 96 I must compete with every other Federal discretionary account to fully fund a broad array of missions that span the globe and have not diminished over time.

For the past 5 years our annualized appropriations for operations and maintenance has been below the Budget Control Act floor. As the other armed services lament the prospect of being funded at the BCA water level, the Coast Guard finds itself under water in that regard.

Our 11 statutory missions, they best align with those of the Department of Homeland Security. And two of our highest priority regions, reining in transnational criminal organizations like never before across the Western Hemisphere, Central and South America, before they reach the United States, and exerting sovereignty while protecting safety of life at sea in the Arctic, do not rank high in the regionalized national military strategy.

So yes, we are moored in the proper home port in the Department of Homeland Security, and simply require the right funding mechanism befitting a military service.

So, going forward, the Coast Guard requires 5 percent annualized growth in its operations and maintenance account and a $2 billion floor in our acquisition account. This would allow me to dig out of the Budget Control Act basement, sustain current operations, and grow our workforce while concurrently building out our fleet of National Security Cutters, Offshore Patrol Cutters, Fast Response Cutters, icebreakers, inland construction tenders, reduce our shore infrastructure backlog of $1.6 billion, missionize our C–27J aircraft and advanced land-based unmanned aerial systems, and make that a program of record.

Now I regret the less-than-timely—and all you have seen is a chart of our 5-year Capital Investment Plan. We continue to be in negotiation on late receipt of a budget as we move forward, and a Service that has lived through 16 continuing resolutions over the last 7 years, and 2 funding lapses, and 40 percent swings in what our annualized capitalization investment is going to be year to year.

Our unfunded priorities list, that reflects reality. And what it shows is a 40-percent gap in our 5-year Capital Investment Plan and what we need to be a Coast Guard of the 21st century.

Now, rest assured, I will continue to work with our Department, with this administration and with Members of Congress to close these gaps going into the future. And what you need, and I fully understand, is our 20-year CIP [Capital Investment Plan].

As a military service, we are the only military service that can say we have a clean financial audit opinion. We have done that now for 4 consecutive years. We are delivering ships on time, on budget, with zero growth, and with zero deficiencies, and these ships pay for themselves in value of contraband removed on their maiden deployment. And these ships will be in service for more than three decades to come. It is a great investment.

And I appreciate the investment that this committee has made to our United States Coast Guard. That makes us the world's best Coast Guard, bar none.

And looking out for the welfare of our people and our blended retirement system to ensure that we do not sacrifice our retirements, our benefits, and to make sure that we have a permanent solution to this legislative mandate that addresses blended retirement.

So on behalf of all 88,000 men and women who serve our Coast Guard, thank you for serving us. I look forward to your questions.

Mr. HUNTER. Thank you, Commandant. Just because we are so happy to have people here I am going to yield to Mr. Lewis for 5 minutes.

Mr. LEWIS. Thank you, Mr. Chairman, and thank you, Admiral, for appearing here today and for your service. We obviously honor that and appreciate it.

I just have one quick question, and I brought it up at the last—one of the last hearings, anyway, and that was about the need to keep open our shipping lanes in the Great Lakes in the harsh winters. I come from the great State of Minnesota, and it is vital in Duluth and throughout the country.

So I am wondering. There is a lot of attention on the polar icebreakers, but I am wondering, trying to cover the cost of delays and millions of dollars of commercial revenue when we have got severe ice coverage on the Great Lakes, what the Coast Guard—or where we are in the procurement of a couple of much-needed Great Lakes icebreakers right now.

Admiral ZUKUNFT. I thank you for that question. So, current state, we are extending the service life of our 140-foot icebreaking tugs, who have performed yeoman duty up in the Great Lakes. We have had an advantage of a very light ice season, so we are not putting wear and tear on any of these assets.

And we have also entered into an agreement with our Canadian counterparts several years ago to assure that we have some agreement between the two if we have severe ice seasons like you saw in 2014 and in 2015, that we can apply those scarce resources to the best advantage.

As you have seen, there is a line item in our 2017 budget that addresses design and construction of a Great Lakes icebreaker. If I were to rank that on all my priorities right now, my biggest priority in my icebreaking fleet is going to be our heavy icebreaker, which is consuming not just bandwidth, but also a significant portion of our budget, as well.

Mr. LEWIS. No, and I understand that. I understand that national security implications of the polar icebreakers and getting all of that done. But I am, obviously, concerned. I think there is, what, one—the *Mackinaw*, one icebreaker in the Great Lakes, is that correct?

Admiral ZUKUNFT. That is correct, Congressman.

Mr. LEWIS. And so we are extending the service life of the 140-foot icebreakers. Do you have any idea how long that extension is, or what the life expectancy is?

Admiral ZUKUNFT. Yes, we plan to get 10 more years out of those vessels.

Mr. LEWIS. Ten more years. I am just wondering at what point—I mean you mentioned—and I certainly share in your concerns how the Guard has been shortchanged in a number of areas with regard to the BCA levels, or just getting 4 percent of DoD appropriations, and things like that. But I do think this is a very important part of your mission, obviously, with regard to commerce in the Great Lakes, and I would just call your attention to that.

And I yield back, thank you.

Mr. HUNTER. I thank the gentleman. The ranking member of the full committee is recognized.

Mr. DeFazio?

Mr. DEFAZIO. I thank you, Mr. Chairman.

Admiral, you did state in your testimony about the need for $2 billion to begin to catch up. And, you know, I understand the pressures you are—the Service has been under, and I am—always endeavor to support additional funding.

But even in this 5-year outline you provided us, you don't any one of those years hit the $2 billion. I mean it looks like it roughly—$800, $600, $400, $200, $300 million short. So that totals up to, you know, well over, like, $1.4 billion, something like that. So how does this reflect being able to catch up on the $2 billion a year?

Admiral ZUKUNFT. Congressman, I am glad you brought that up, because what that does reflects is fiscal guidance. And we are a Service that has lived within fiscal guidance, and fiscal guidance is not getting the mission done for us.

So the 5-year—those numbers that you see that don't approach $2 billion, those are the constraints of living within fiscal guidance.

Mr. DEFAZIO. OK——

Admiral ZUKUNFT. The priorities——

Mr. DEFAZIO. Meaning you are being dictated to, in terms of what you can ask for?

Admiral ZUKUNFT. Yes, sir.

Mr. DEFAZIO. OK. And whoever is dictating is dictating that you come up with numbers that are not adequate. I would just like the record to reflect that.

A quick question about the icebreakers. There was one report recently that, you know, if we bought a group, a standardized design, four or five, we could get the price down after the first one. And then there was a question about militarization.

And I guess my question would be—and I don't know if you are the appropriate person, but it seems to me that, you know, I could envision a point at which—I mean the Navy is not going to be able to get assets up into what is basically going to become a seasonal shipping lane and an area of potential conflict between ourselves and the Russians, given the extraordinary claims they are making in the Arctic.

And, you know, maybe the Navy should be paying for these icebreakers, and you guys operate them. What do you think?

Admiral ZUKUNFT. Well, we already have an integrated program office, stood up with the Navy, and $150 million in the Navy shipbuilding account. That builds 20 percent of an icebreaker. I would like to see 100 percent of the first icebreaker, then look at block buy. And at that point I am agnostic, in terms of source of funding.

Does it support homeland security? Does it support defense? Does it support the United States of America? And, most importantly, it answers that question. We have unique, sovereign interests that other nations are encroaching upon. As you mentioned, Russia is claiming all the way up to the North Pole.

Mr. DEFAZIO. Right.

Admiral ZUKUNFT. We are just sitting there, watching that happen. We need a means to exercise our sovereignty in these high latitudes, and we are severely lacking in that.

We will need that legislative approval to do block buys. But beyond this first icebreaker, we need to look at a block buy of icebreakers and accelerate the buildout of this program.

Mr. DEFAZIO. OK, excellent. Thank you.

On the issue of the security on the Potomac, have there been or could there be discussions with the Secret Service regarding something less than a bank-to-bank, you know, total closure over a couple-of-mile section of the river?

Admiral ZUKUNFT. I happened to fly over that very same stretch of river late yesterday afternoon, over the golf course. As you mentioned, there is no foliage. So it is clearly exposed from the riverfront up to the clubhouse.

We are working with the three canoe groups, the kayak groups, to allow them passage on the Maryland side of the Potomac River. And then, once you get beyond that, you enter class 1 rapids, which you will not take an inner tube down. So we are looking at striking a balance between the two.

So, as you have brought up—and Ranking Member Garamendi, as well, have elevated this issue. We listened, and we are making that accommodation to the public.

Mr. DEFAZIO. OK. For just the organized groups, or would that include individual canoeists? I mean——

Admiral ZUKUNFT. So we have met with the American Canoe Association——

Mr. DEFAZIO. Right.

Admiral ZUKUNFT [continuing]. With the groups that haul out there. And as long as they stay to the Maryland side of the Potomac River, they can pass clearly when the security zone is in effect.

Mr. DEFAZIO. OK. I hadn't seen that notice, or that change in the notice. So that is welcome news.

And would that accommodate the kids in the camp, too?

Admiral ZUKUNFT. It would.

Mr. DEFAZIO. OK. That is very good news, then. OK. Thank you. I will look forward to seeing—now, is that a final disposition? Because you had a pending rule. Is it——

Admiral ZUKUNFT. Well, I read your letters.

Mr. DEFAZIO. Yes.

Admiral ZUKUNFT. And, rather than read it, I have to see it.

Mr. DEFAZIO. OK.

Admiral ZUKUNFT. And I am meeting with our staff, the sector commander. You know, we can make an accommodation here.

Mr. DEFAZIO. OK, excellent. OK. Well, thank you.

Thank you, Mr. Chairman.

Mr. HUNTER. I thank the ranking member of the full committee. I now recognize myself.

We will just start rolling here, Commandant. The UPL [unfunded priorities list] that went to OMB and then finally got to us didn't include six FRCs [Fast Response Cutters] for CENTCOM [U.S. Central Command]. How big of a priority was that for the Coast Guard?

Admiral ZUKUNFT. When the Executive order came out on restoring readiness for our military, as soon as that was released, I sent a memo to the Department of Defense, to the chairman, to the Secretary of Defense, and said we are going to need to recapitalize these six patrol boats that are serving in the Northern Arabian Gulf.

I have also met with the CENTCOM commander, as well. There is an enduring requirement to do so. But to use DoD funding to be able to build those out. So the reason that does not appear in our unfunded priorities list, that could be funded by the overseas contingency operations or some other mechanism, because that will have an exclusive and sole purpose, DoD mission, to——

Mr. HUNTER. Do you think DoD is going to spring for that, then?

Admiral ZUKUNFT. I am hopeful that they will.

Mr. HUNTER. You have a timeline?

Admiral ZUKUNFT. I do not. So they are looking at how long can these 110-foot cutters remain in service. We have only got about maybe 5 years. The good news is we have a hot product line for these Fast Response Cutters, and we are turning these out. As I mentioned, the last five came out with no discrepancies. So we can turn out service-ready platforms——

Mr. HUNTER. So, theoretically, you would just add—tack on these six to the hotline at some point, and get them over there?

Admiral ZUKUNFT. Correct.

Mr. HUNTER. Got it, thank you. I guess we can go to the timing. And this kind of falls into the overarching question of the relation between the shortfall of the acquisition, construction, and improvements, and the planning for that, and your mission capability, because that is what we are looking at, right? That is a—we are saying, in dollars, about $200 million short, at the best. And then, lower than that, much more—the gap is bigger, going through.

[Slide]

Mr. HUNTER. Here is a nice slide. The red line is what we have authorized, the blue line is what has been appropriated, and the green line is what the Coast Guard's budget request has been.

Just above the red line, say an inch, is where your program of record—all your programs of record, let's call them a program of record—that is where those hit, is just above the red line. So your requests never come close. That big spike is, I think, National Security Cutter, right? And then after that, even the appropriated dollars go down until you get another NSC. But those never meet. And that is expressed in dollars.

But what I would like you to do right now is talk about it in terms of capability.

Admiral ZUKUNFT. So, what you are looking at is, you know, life below the floor of the Budget Control Act. When we deal with our fiscal planning guidance, it typically comes in at or below the floor already. And then, with each iteration—over the last several years we have been asked to then identify a 5-percent excursion, in addition to a funding level that is already funded below the BCA floor, which is why I am looking at a 5-percent annualized growth in this account to dig out of what is literally a basement, and we have been handed a shovel.

So, where does that pain get filled? Well, we start deferring maintenance. You defer maintenance, you go down a slippery slope. We have 72-year-old inland construction tenders in service today that enable $4.6 trillion of commerce to take place. And we never stepped out and said, "Well, what are we going to do about investing these?"

So, part of it I bear the responsibility of. We have been a Service that will only build one thing at a time: the National Security Cutter. When we finish that, we will move on to the next. Well, there's five classes of ships that we need to recapitalize today.

And not just the ships, but also the outgoing maintenance to maintain these ships, as well, because too often we just look at the initial acquisition cost and not the outyear expenses for training, for people, for maintenance, and that is where you start running into a train wreck, is when you start deferring maintenance or you start cutting force structure. And that green line has taken us to a place where we cannot continue to navigate into the future.

Mr. HUNTER. OK, but your 20-year plan, which we don't have, I would guess that that would lay those things out.

Admiral ZUKUNFT. It will.

Mr. HUNTER. Right? That would—I mean that is where you would get that information from. So have you submitted the 20-year plan?

Admiral ZUKUNFT. We have not, and I owe that to you.

Mr. HUNTER. So it has not even been submitted to the Department at all?

Admiral ZUKUNFT. It has not.

Mr. HUNTER. OK. I guess, following up with that—and I think we have asked you this every time you have been in front of this subcommittee—why do you think that discrepancy is there? Do you think it is a—the—because DoD doesn't have this problem. DoD is able to be—they are strong enough, they can tell OMB to go pound sand.

You say you are a defense service, a military service, yet your 11 statutory missions fall in line with homeland security. But the Department of Homeland Security is not funding you appropriately. So is it a question of Coast Guard willpower, like the will to get this done? Brain power? What is the problem, do you think?

Admiral ZUKUNFT. Part of it is just the categorization of our appropriation: non-defense discretionary. And so, 96 percent of that—we compete with all other Federal non-discretionary funding. And there are lots of non-discretionary funding needs, and I don't take that away from anybody. But as a military service, you know, I am

competing for every other aspect, and yet only 4 percent of our funding comes from a defense appropriation.

A recategorization of that would allow me to compete better. But when I get fiscal planning guidance, which is focused on that 96 percent, and then how do we divvy up nondefense discretionary, that is how you end up with green lines. That is how you end up with, well, you need to take a 5-percent excursion below the BCA floor because we need even more non-defense discretionary.

The Coast Guard will never bail out our Nation's debt, which is going to approach $830 billion in the year 2026. My budget is under $11 billion. The Coast Guard is not going to pay us out. But we are a great investment. And what we have not done adequately enough is play offense. And this defensive back-and-forth of how do we build out a budget in the outyears, we need to state our need——

Mr. HUNTER. Let me interject. If your—but when you are in the Department of Homeland Security, and you are, let's say, tightly held to that planning—to that financial guidance, how do you expect to break out of this?

Admiral ZUKUNFT. I am seeing very positive signs. We saw that during a passback that went public, the Coast Guard would have seen a 13-percent reduction to its budget. Our Secretary, Secretary Kelly, went to the highest places to ensure that the Coast Guard was fully funded for 2017. And we are.

But we have tremendous support, and we did from Secretary Johnson, as well. But the access that this Secretary has to key leadership within this Government who understands the United States Coast Guard, who understands the military—we have very good alignment with senior leadership today.

Mr. HUNTER. Do you think that your financial guidance is going to change?

Admiral ZUKUNFT. I do.

Mr. HUNTER. Towards that red line?

Admiral ZUKUNFT. I do, Chairman. And I will work to make sure that happens.

Mr. HUNTER. When do you think that—that we will see that reflected?

Admiral ZUKUNFT. I want to see that happen in 2018, 2019, and, again, I want to see—you know, I am serious about this 5 percent annualized growth, $2 billion. And people say, "Well, you are asking for too much." You know, the fact that we can account for our dollars, the fact that we have almost no growth at all in our acquisition budget—and again, when the Coast Guard cutter *Stratton* or the *Hamilton* returns from its maiden voyage with $1 billion of cocaine on it——

Mr. HUNTER. If we could sell that cocaine, we could——

[Laughter]

Admiral ZUKUNFT. Well, we are not there yet. But we are transnational——

Mr. HUNTER. California is going to legalize coke——

[Laughter]

Admiral ZUKUNFT. Where they are most vulnerable, really, is when they are on the water. And their biggest dread is when they see a National Security Cutter. Launching a ship-based unmanned

aerial system—they don't even know they are out there, until we find them. And then that armed helicopter arrives overhead. And if they try to run away, we stop them: 585 smugglers brought to the United States for prosecution, 100 percent of them prosecuted here, in the United States. I think that is a successful mission.

Mr. HUNTER. Last thing, then I am going to pass it on to Ranking Member Garamendi.

We had a debate—not quite a debate, we just did the National Defense Authorization Act, and we talked about icebreakers, and we talked about the fund. I think we lost that amendment, right?

Chairman Thornberry voted against the amendment to allow icebreaker money to go into their account in the Navy. And what I got from that is that the political leadership here, and the Department of Defense, and the Navy, none of them see icebreakers as a national security asset. That is what I took away from it.

Why is that? Do you think that is correct? Do you think it is more of a savings lives, when you start drilling for oil and going after natural resources in the Arctic? Or do you think there is a national security mission, not a search-and-rescue, break-boats-out-of-ice mission.

Admiral ZUKUNFT. Let me answer it this way, Chairman. We have an area the size of the State of Texas that is part of our extended Continental Shelf. And nearly half of the oil and gas reserves are below that sea floor, in our 200-mile limit and our extended Continental Shelf.

China has an icebreaker on its way right now, and they will do scientific research in this extended Continental Shelf. And maybe someday we ratify the Law of the Sea Convention, and we claim was is rightfully ours. China will contest that. And so we have sovereign interests that are up there.

Russia will take delivery of two icebreaking corvettes with cruise missiles on them. They are militarizing search-and-rescue stations. And doesn't this look like a movie we have seen in the East and South China Sea? It is known as area access denial, and we have no means to exert sovereignty.

So, what do you need an icebreaker to do, not just today, but 30 years from now? Reserve space, weight, and power, because you might have to weaponize this icebreaker. It is great we have submarines, but I think it is very difficult to exert sovereignty with a submarine. You have one course of action, and that is to sink an adversary.

Mr. HUNTER. Well, tell me, what is the disconnect, then?

Admiral ZUKUNFT. So the disconnect——

Mr. HUNTER. Because what you are saying makes sense to us, but no one else is buying it. And that was made clear last week.

Admiral ZUKUNFT. Well, I think you answered the question: buying it. Buying it.

Mr. HUNTER. Money.

Admiral ZUKUNFT. This is an issue of national security.

Mr. HUNTER. This is one of those things that everybody says we need, but nobody wants to put the money in.

Admiral ZUKUNFT. Yes, sir.

Mr. HUNTER. All right. Thank you very much.

Ranking Member Garamendi, you are recognized.

Mr. GARAMENDI. In your opening statement you said that the Coast Guard provides Department of Defense services. You mentioned 20 cutters, you mentioned aircraft. What is the total cost of the services that you are currently providing for national defense purposes? Worldwide.

Admiral ZUKUNFT. Congressman, I will break that out and provide you what that breaks out to. And that includes salaries, maintenance, it is a pretty significant number, when you add it all up. It is not just the cost of burning fuel, doing a mission.

[The information from Admiral Zukunft of the U.S. Coast Guard follows. This information is an update to the Coast Guard's fiscal year 2014 report to Congress: "Defense-Related Activities," which is on pages 103–109.]

Introduction

In response to the Coast Guard and Maritime Transportation Subcommittee's July 26, 2017, request to provide "an itemized accounting for Coast Guard support to COCOMs (assets, personnel, operations, etc.)," the Coast Guard submits the below update to its fiscal year 2014 report to Congress, which was titled, "Defense Related Activities."

Since 2001, the Coast Guard has derived $340,000,000 (excluding overseas contingency operations) of its annual Operating Expenses appropriation for defense-related activities. The update below applies the same methodologies used in the 2014 report to provide new estimates using fiscal year 2016 data. Additionally, the Coast Guard conducted further analysis to include pay and allowance costs for Coast Guard members when they conduct defense-related activities.

Operating Expenses

For fiscal year 2016, the Coast Guard's estimated allocation and expenditure of the aforementioned $340,000,000 is estimated to be:

Defense-Related Activity	Fiscal Year 2016 Allocation (BA in millions)	Fiscal Year 2016 Expenditures (BA in millions)
Defense Readiness	$17.172	$16.553
Domestic Support	$193.885	$195.448
Memorandum of Agreement Annexes	$27.757	$24.095
Support to Combatant Commanders	$22.902	$10.245
Subtotal	$261.715	$246.340
Drug Interdiction	$78.285	$93.660
Total	$340.000	$340.000

The Coast Guard's Mission Cost Model estimates of Operating Expenses funding allocations and expenditures for total defense-related activities in fiscal year 2016 are provided below:

Defense-Related Activity	Fiscal Year 2016 Allocation (BA in millions)	Fiscal Year 2016 Expenditures (BA in millions)
Defense Readiness	$79.066	$74.067
Domestic Support	$222.468	$195.448
Memorandum of Agreement Annexes	$115.094	$107.818
Support to Combatant Commanders	$48.937	$45.843
Subtotal	$465.565	$423.176
Drug Interdiction	$447.380	$419.096
Total	$912.945	$842.272

Other Discretionary Appropriations

Programs funded by Acquisition, Construction, and Improvement (AC&I); Reserve Training (RT); and Research, Development, Test, and Evaluation (RDT&E) ensure that the Coast Guard has the necessary assets, and properly trained and equipped force to conduct defense-related activities. The estimates for each of those appropriations in fiscal year 2016 are provided below:

Defense-Related Activity	Fiscal Year 2016 Allocation (BA in millions)
AC&I Defense Readiness	$144.177
AC&I Drug Interdiction	$676.154
RT Defense Readiness	$7.561
RT Drug Interdiction	$14.393
RDT&E Defense Readiness	$0.605
RDT&E Drug Interdiction	$1.716
Total (Other Discretionary)	$844.606

Total of Discretionary Defense-Related Activities: $1,757.551 (in millions)

The Coast Guard's Mission Cost Model estimates of Operating Expenses funding allocations and expenditures for total defense-related activities in fiscal year 2016 to include pay and allowances are provided below:

Defense-Related Activity	Fiscal Year 2016 Allocation (BA in millions)	Fiscal Year 2016 Expenditures (in millions)
Defense Readiness	$162.205	$157.206
Domestic Support	$482.401	$455.381
Memorandum of Agreement Annexes	$236.117	$228.841
Support to Combatant Commanders	$100.396	$97.302
Subtotal	$981.118	$938.729
Drug Interdiction	$917.807	$889.524
Total	$1,898.926	$1,828.253

Total of All Discretionary Appropriations' Defense-Related Activities (including OE pay): $2,743.532 (in millions)

Mr. GARAMENDI. Yes, I would appreciate that information.

When we took this issue up on the floor with an amendment that I proposed last week, the chairman—I think it was the chairman of the Appropriations Committee spoke on the floor and said that the Coast Guard does not provide any national defense services.

In answer to the question that the chairman just posed to you, the problem is ignorance amongst us. And so we have to deal with that. And if you can provide us with the information about the actual cost of the services and all of the equipment, airplanes, cutters, et cetera, it would be helpful in providing a little level of knowledge to keep people here, within this Department.

Also, we might send that information to the Office of Management and Budget, where I think I heard you say—no, you didn't accuse them of the problem, but you did say you were given instructions. And so this sheet of information that you gave us is really a result of the Office of Management and Budget telling you what you must tell us.

Don't respond. I don't want you to get in trouble.

However, I do note that the Office of Management and Budget is willing to spend $1.6 billion on a 40- to 70-mile extension of existing walls, or repair of existing walls on the Mexican border. What could you do with $1.6 billion to really protect the United States from immigrants, drug smugglers, and the like on the southern border?

Admiral ZUKUNFT. If you will allow me, firsthand—where have I been in the last month? Meeting with Presidents in Colombia, in—the Vice President of Ecuador, the President of Panama, and heads of state in Mexico City.

When I was in Ecuador, they have violent crime and they have drug usage because of the rampant growth of cocaine coming out of the country of Colombia. Colombia is besieged with the amount of coke under development.

Mexico is seeing it at their front at the far end of this, but everyone is saying, "We need more United States Coast Guard off our coast." And as successful as we are, it really comes down to sheer numbers.

We don't have enough planes in the air, to include unmanned aerial systems, enough ships on the ocean to leverage all of the information. We have an awareness of over 80 percent of the drug flow that is ultimately destined for our Nation. It doesn't land, you know, just—well, it lands 1,500 miles south of the border. It lands in bulk in 80-pound bails of cocaine. And when it lands, law enforcement will turn their head the other way because, if they don't, they will be killed.

The rule of law goes out the window. That is why we are seeing violent crime. With that violent crime—which is why you are seeing families putting their children in the hands of human smugglers to get them to the United States. The irony is the United States demand is driving this train. And yet they want to get their children here, in the United States.

But to stop this, where this threat is most vulnerable, is actually at sea, where this law enforcement agency will not turn its back. We will seize you and we will prosecute you. That, to me, is a key instrument of regional stability right here in our backyard, where we see some of the worst violent crime in the world—is right here, just to the south, and well south of our border with our trade partner, Mexico.

Mr. GARAMENDI. You gave a very good description of what you are doing. What could you to with $1.6 billion in—these are our choices. We, the representatives of the American people, are making a choice to spend $1.6 billion on a wall, on some 40—maybe 70 miles of wall, instead of spending that money on the U.S. Coast Guard, or on any other thing.

And my question is, if you had $1.6 billion—it is going to be spent in the next year, it is going to be spent in 2018, a budget year, $1.6 billion. Now, we could make the choice to give $1.6 billion of additional money to the Coast Guard. You could build three icebreakers over the next 3 years, 4 years, with $1.6 billion. Is that correct?

Admiral ZUKUNFT. Once——

Mr. GARAMENDI. About 700—well, 2½.

Admiral ZUKUNFT. Yes. But once we award a contract, do a block buy, and then it is a delivery schedule. You know, we build out not four, but six Fast Response Cutters each year. We accelerate the buildout of the Offshore Patrol Cutter. Because these are the assets, especially our Fast Response Cutters, Offshore Patrol Cutters, that we can bring and swing into this part of the world.

Mr. GARAMENDI. And for icebreakers, if you had a block buy, they are $700 to $800 million apiece? I think that is the current estimate.

Admiral ZUKUNFT. That is a ballpark figure.

Mr. GARAMENDI. So, 2½, not three. These are choices. These are choices that we are making.

I listened last night to the—sitting there, listening for hours to the Rules Committee debating whether to—what to do with this $1.6 billion for a wall. I just bring this to the attention of all of us here.

Currently, the plan is three heavies and three lights to deal with the issues—icebreakers, going forward. They are not in your budget, they are not in your 5-year capital investment acquisition, construction, and improvement budget, nor are any of the onshore facilities that are in the document that you gave us of unfunded priorities.

Incidentally, I don't see in this document, either, the two additional heavies or the two—or the three lights. Is that an unfunded priority that is not listed here?

Admiral ZUKUNFT. What you are seeing is just our near-term unfunded priorities list.

Mr. GARAMENDI. OK.

Admiral ZUKUNFT. That doesn't take us out into our 20-year CIP.

Mr. GARAMENDI. I noticed that you are operating—your total budget is somewhere around $10 billion a year—maybe $11 billion, if we——

Admiral ZUKUNFT. A 10.7——

Mr. GARAMENDI [continuing]. Add in the——

Admiral ZUKUNFT [continuing]. Salaries, retirement, that is everything.

Mr. GARAMENDI. I am going to just speak to the chairman here for a moment. There are two of us on this committee that are also on the Armed Services Committee. And over the last week, I know you and I have been trying to leverage into the Department of Defense's $700 billion budget another $1 billion or so for the Coast Guard for the—particularly for the icebreakers. We have been unsuccessful in doing that. And I think we ought to continue to try to do that.

I do not have an explanation for the question you raised, Mr. Chairman, about why the U.S. Navy wants to build 350—or have 355 ships, and not be able to use any of those ships, except for submarines, in the Arctic Ocean. It makes no sense to me at all. They want to build more LCSs [littoral combat ships], which are, by their own estimate, useless in a conflicted environment, but yet they want three more of those, which—those three could fund two of the icebreakers.

I don't understand. I don't understand what the U.S. Navy is thinking here. Nor do I understand what my colleagues on the

House Armed Services Committee are thinking about continuing to build ships that are useless in the Arctic, and we know the Arctic is a contested environment today, and will be more so in the future.

So I guess I am just speaking, I don't know, maybe to myself here. But I want the public to know that there is a serious error being made by the House Armed Services Committee, and specifically by the subcommittee dealing with seapower, in that they are building ships that are not capable in a contested environment, LCSs, that do not perform even the services in an uncontested environment for which they were designed.

At the same time, unwilling to provide the U.S. Coast Guard, which is a defense organization, as well as a civilian organization, with the money it needs not only for icebreakers, but to provide the men equipment necessary for the existing Department of Defense services that they are doing.

So maybe I am preaching to the choir here, but I want it on the record that we are making some serious errors, and we have got to correct these errors.

With that I yield back.

Mr. HUNTER. I thank the ranking member. I think the Coast Guard actually built the best LCS. It is called the NSC. That is what the Navy needs to get on board with.

The former chairman of the committee, whose portrait sits behind you, Commandant, is now recognized.

Mr. Young?

Mr. YOUNG. I thank you, Mr. Chairman.

Mr. HUNTER. And let me introduce his wife; Anne is back there, too. Welcome, Anne.

Mr. YOUNG. I thank you, Mr. Chairman, for having this hearing. And, you know, someone once told me you always pay for the sins that you have sown. And I look at my portrait every day and I think I am paying for my sins right now.

But Admiral, welcome. We appreciate it. How old are you?

Admiral ZUKUNFT. Sixty-two.

Mr. YOUNG. OK. Let's see, 62. You were 14 years old, approximately, when I got elected. So congratulations on your climb to success.

Admiral ZUKUNFT. That makes you a ranking member.

Mr. YOUNG. Yes, thank you. I—you know, we hear a lot about—and I listen to my—the minority leader, vice chairman of the committee, and I appreciate what he is saying. We are actually concentrating on an icebreaker or breakers in the Arctic. And I know we need those, but that is not a defensive weapon.

And I look at the border of Alaska, and especially in the Arctic, with the activity of Russia and China, it is—some—China is building icebreakers, which I don't understand. And so, of course, Russia has got a whole lot more being built.

Have you looked at—Admiral, I know this has been an ongoing battle with me and the Coast Guard over the years—the other possibility of getting an icebreaker into the arena quicker than having one constructed? Like leasing from another outfit? You know I have been talking about this a long time. Have you analyzed this again?

I know the last time we had a study it was 1980. That is a long time ago. So is there a way we can put metal on the water, especially for the new shipping through—and the cruise ships. Because that *Healy* is old. And is—have you looked at that at all?

Admiral ZUKUNFT. We have, in fact. One potential vendor we have had multiple interactions. They have a platform that has yet to complete ice trials. We would not want to lease something that can't demonstrate its ability to actually operate in the ice that *Healy* sees. *Healy* was actually—sat in ice for 36 hours last year. So it is not ice-free up there, and that is a medium icebreaker. This particular platform doesn't have the capability of *Healy*.

But we would at least want to make sure that ice trials were completed, that we could actually be a good steward of taxpayer dollars to lease a platform that would meet our requirements. So we have had multiple interactions. Last one was probably in May. And the issue of ice trials is still on the table right now.

Mr. YOUNG. The vessel itself that you are talking about—and I happen to agree with you, if it doesn't do the job, you don't want to lease it. But, you know, we could probably lease a vessel for a whole lot more for a short period of time than we—because I don't have confidence we are going to get the money to build the icebreaker you need.

For some reason, the Arctic is still not on the forefront of everybody's mind right now. This health bill and tax bill and transportation bill—where is Mr. Shuster? You know, all those things. But they are not thinking about what you need.

And we keep adding on to you, and as the chairman has said, we are not properly funding you. And that concerns me. And I just want you to know that.

I have—I think the last icebreakers were built by Lockheed and they are no longer in operation. Is there a—is there capability with the ship industry to build a good icebreaker?

Admiral ZUKUNFT. I am very confident there is, Congressman. There are five shipyards that we have awarded industry studies to. They have done mockups of ice trials, and they are actually ahead of the power curve, so to say, in terms of their ability to submit a request for proposal, where we could honor and start cutting steel.

What I have in front of me, this is a—about the weight of a gold brick. That is a piece of steel out of the Coast Guard cutter *Polar Star*. We have not build ships like this since Lockheed Martin built the *Polar Sea* and *Polar Star*. They are very confident we can build these here in the United States, built in the U.S., with U.S. workers.

Mr. YOUNG. Well, they will be built in the United States. That I will guarantee you.

Admiral ZUKUNFT. Yes, sir.

Mr. YOUNG. I am not going to—any foreign ship. Now, back to parochial activity. As you know, I like your fast cutters, or Fast Response Cutters. I happen to be privileged to be on one when it first made its maiden voyage. Great ship.

But I am a little concerned, parochially, about one-on-one docking, porting, because it looks like now you are going to have two

in Ketchikan, one in Sitka. Petersburg has been left out, but they had a tender there.

As we build the next one—I think you are building six more?

Admiral ZUKUNFT. Yes, six will be home-ported in Alaska. Sitka, as you mentioned. Seward, Kodiak are other ports of consideration, in addition to where we have two in Ketchikan right——

Mr. YOUNG. But again, I am interested because, if you look at Alaska—come to my office and look at that map—that is a hell of a coast. And we do have problems, you know. I will listen to your testimony on the drug problem, you know, I did—you apprehend, you know, get everything done, and then you say they are prosecuted. But how is the prosecution going? How many—are we doing anything about it after you catch them?

Admiral ZUKUNFT. We are doing phenomenally well here, in the United States, 100 percent prosecution. If they are prosecuted downrange, maybe 5 percent. So extradition, prosecution in the United States. And these aren't wrist-slaps. These are 10-, 12-, 15-year sentences. They might be able to bargain down if they are providing us valuable information about where this activity is leaving. So when we talk about organized crime, it becomes disorganized once they face prosecution.

Mr. YOUNG. Well, I know I shouldn't say this, Mr. Chairman, but I had a bill I have written up that is pretty good. It is called D&D bill. You deal and you are dead. The demand is huge in the United States, I don't understand that, but dealers just absolutely are committing murder. And the prosecution is great, 10 years, 5 years, that doesn't mean anything. If you knew that you were going to be hanging from the yard line, you might think a little differently. Thank you, Mr. Chairman.

Admiral, congratulations again. Good job.

Admiral ZUKUNFT. Thank you, sir. Thank you for your many years of service.

Mr. YOUNG. Yes.

Mr. HUNTER. Thank you, Mr. Young. Mr. Lowenthal is recognized.

By the way, we almost had an all-California up here. Don messed it up.

Dr. LOWENTHAL. Honorary Californian.

Mr. YOUNG. I am from California.

Dr. LOWENTHAL. Good morning, Admiral. Cybersecurity, I am going to focus a little bit on cybersecurity. And first, thank the Coast Guard for really helping our PORTS Caucus when we—in our latest discussions about cybersecurity, and I will ask about that. It is both a critical part and component of our homeland security, and also security for our transportation network.

We all know that an attack upon our critical or crucial infrastructure such as the ports can have a tremendous impact on goods and movement. And in turn, the entire U.S. economy. We—this is a—so the first question is what is the Coast Guard doing to keep our ports safe from cyber attack, and to also safeguard our critical maritime infrastructure?

And then the second question is—and I want to again thank you for your help—what did the Coast Guard learn? What lessons have we learned from the recent attack against Maersk, which, as we

saw, closed down a number of their terminals, the APM Terminals, throughout the Nation?

So, kind of what are you doing, and what have we learned now, using this as a learning experience?

Admiral ZUKUNFT. Great question, Congressman. So, for more than 14 years now we have had Area Maritime Security Committees in 37 of our major ports where we have a captain of the port. Let me take L.A./Long Beach as an example. They also have cyber subcommittees on these Area Maritime Security Committees.

Now, when the committees were first stood up, there were security measures that were put into place: fencing, cameras, lighting, transportation worker identification credentials, and the like. Industry wasn't so pleased with some of these requirements, but it was written into law.

Now we are dealing with a whole new threat called cyber. We were working with the National Institute of Standards and Technology, who actually put out voluntary guidelines to all of industry.

But I use L.A./Long Beach as a great case study. I was out at Long Beach container terminals last year, and they have nearly fully automated that container terminal. Drayage trucks that are moved autonomously, they use batteries, they don't burn fossil fuel——

Dr. LOWENTHAL. We are talking about Long Beach container terminal?

Admiral ZUKUNFT. Yes, sir.

Dr. LOWENTHAL. Right now the——

Admiral ZUKUNFT. So now we have an event with Maersk terminals. In fact, I will be in L.A. on Friday of this week, and I am going to meet with Maersk to say what did they learn from this. What they immediately did was they shut down most of their operations. This particular piece of malware erases all of your data. So they took mostly precautionary measures by doing a shutdown before their data would have been erased, and then to make sure that they could bring those systems back online.

What it does indicate is the lack of resiliency in our entire maritime transportation system if you look at all of maritime shipping, and if there is a cyber event that brings that down.

As you well know, off the coast of California, this is just-in-time inventory. And a billion-dollar-plus of commerce goes through the ports of L.A./Long Beach each and every day. And it doesn't stop there, it goes on a rail system, it goes through the Rust Belt, and it goes to New York, and it goes on to Antwerp, from there. So any disruption along that supply chain has a global consequence. And what that did elevate is we can't take our eye off the maritime domain.

Maersk is doing a great job. Sometimes you are beholding to a subcontractor, someone else that has access to your data, they provide a back door into your systems. And so that is the vulnerability that we need to look at closing, as we start looking at what is cybersecurity.

And the other challenge is how do we hold those accountable who would actually try to disrupt our supply chains, because this is really an attack on our national security, at the end of the day.

Dr. LOWENTHAL. Did you learn anything that you might change some of our procedures or our interactions with other agencies? Out of this, what did we learn? What did the Coast Guard learn, in terms of how effective they were in responding to this, and having responses, coordinated responses, from all the potential agencies that are impacted by a cyber attack?

Admiral ZUKUNFT. Yes. Well, the first thing we learned, Congressman, is we don't have the cyber cavalry, if you will, a cyber protection team that can go out and immediately apply patches to allow an industry to recovery from a cyber attack.

What we also learned, though, is Maersk reported. And sometimes there are disincentives to reporting that your systems may have been compromised, because obviously, you know——

Dr. LOWENTHAL. Right.

Admiral ZUKUNFT [continuing]. In the private sector that could have secondary consequences. But the fact they were forthcoming, so we could look across the entire cyber domain within the maritime transportation system, and ascertain that this was the only one that had been singled out across all the maritime stakeholders, but it allowed us to do a full sweep. Is this part of a concerted attack against multiple domains besides Maersk?

Dr. LOWENTHAL. Well, I am going to yield back. I want to thank you.

I mean I see this as the critical issue, moving forward, is how we implement more cybersecurity, and that we understand just what we are up to, and that the—you know, this is a cooperative venture between the Coast Guard, private industry, our ports. And this could have a devastating impact upon the U.S. economy.

And so, I am just really pleased that you are on it, and that you are working on these issues. Thank you.

Mr. HUNTER. I thank the gentleman. We are going to wrap up here. Mr. Garamendi and I have a couple of last, quick questions, and we will go to the second panel.

Admiral, back to the icebreakers really quick. And the next panel, you are going to have the Assistant Commandant for Acquisition on that one.

Admiral Haycock, you will probably answer some of these, but—Ron O'Rourke can probably a couple of these, too.

But just—what is your take on why you don't want to block buy the first-in-class heavy? Why not start—if you have the design done—and I am sure, with the oversight and the attention that the icebreakers are going to get, everybody is going to make sure that the design is totally done, that lead materials are purchased, that it goes along in that fashion, right, so it is not haphazard. Why not block——

Admiral ZUKUNFT. Well, what we have seen, just in our first ship buys, is that there is a learning curve. And obviously, with a heavy icebreaker, a very steep learning curve. We haven't built a ship of this design in four decades.

So, there is inherent risk doing a block buy, where industry may want to, you know, shed some of that risk. And if we do a block buy of maybe $950 million per copy, well, maybe that second ship we can negotiate down into a more affordable range, and then, recognizing second, third, fourth, and so on, those ships, you know,

you can then get into a more affordable range than we might with a lead ship if we are really trying to get all of our requirements met, but do so at an affordable range.

Mr. HUNTER. So if you—if things go perfectly, when do you think we would start building the first icebreaker, the first heavy?

Admiral ZUKUNFT. We want to award not later than 2019, and have it in the water by 2023, have ice trials done, and, if it meets all those requirements, that is the time to lock in a block buy.

Mr. HUNTER. So how does that match up, then, with the three heavies and three mediums?

Admiral ZUKUNFT. Well, you have probably seen the National Academies of Sciences that said, you know, four heavies.

Mr. HUNTER. Also on the next panel. Their stuff said you could build a fourth heavy for cheaper—for less money than you could build your first-in-class medium.

Admiral ZUKUNFT. I agree with that, the science that comes behind that. Lead ships are typically more expensive. Second ships, you know, you realize some economies of scale. But certainly a fourth heavy would probably come in less expensive than a first medium icebreaker. And it can operate around the globe.

Mr. HUNTER. But right now it is pie in the sky, really, talking about two, three, four——

Admiral ZUKUNFT. It informs another study. So we have the high latitude that said three heavy, three medium. And why six? Well, have you see, whether you are a carrier strike group—but it usually takes three ships to have full-time presence in any given region: one that is there, one that is coming back and will go through a refit, and the other one that is working up and getting ready to go. So that is how you end up with a number of six.

Now, that number four that the National Academies of Sciences released, those are all four heavy icebreakers, but it also includes the *Healy*. So it leaves you with five. So we are still looking at what is the right number. The right number right now is one, and get that first one built, do the block buy, and start building out this program of record.

Mr. HUNTER. Going back to Mr. Young's question, too, about leasing, you said you are waiting for, I am guessing, money for ice trials. That is what you said?

Admiral ZUKUNFT. No real dollars have been negotiated in any of this, so——

Mr. HUNTER. But in real terms, though, you are only paying for gas. I mean what does it cost to do ice trials? It is gas, right? You are not going to hire more coastguardsmen to come in and do it. I mean so that is a—your overhead is fixed. So what does it cost to go do ice trials with the *Aiviq*?

Admiral ZUKUNFT. That would really be for the——

Mr. HUNTER. The—once again, the only existing U.S.-made icebreaker in America.

Admiral ZUKUNFT. So this is a ship that is built with direct drive diesel. Icebreakers are typically diesel-electric, which means the generators push the shaft. And they absorb that shock load every time you collide with ice.

A reduction gear, fixed gear, is going through that—that gear box is going to absorb all that shock. So if you are going to do ice trials,

there is a likelihood you might have to replace a reduction gear. There might be real hidden costs in doing ice trials.

So, if I am a vendor, I might want to protect myself from some of that risk. Now, I am not the vendor, but those may be some of my thoughts of, OK, if you are really serious about this, and I do ice trials, and now I have just caused X number of dollars that I am now going to have to fit—and, oh, by the way, you are not going to lease it because it didn't meet your requirements, I think those are some of the issues that we still have to negotiate.

Mr. HUNTER. And lastly for me, the continuation pay to put you with the other services—and again, this goes back to the Department of Homeland Security versus the Department of Defense versus you as a military service versus you under the Department of Homeland Security with your 11 missions. We got creative, and we were able to do a short-term fix. If you could, just talk a minute about the importance of that, and how you plan on getting in line with the other services when it comes to retirement.

Admiral ZUKUNFT. Yes. Well, Chairman——

Mr. HUNTER. And just about everything else.

Admiral ZUKUNFT. You, you know, Ranking Member Garamendi, your staff behind you, you guys did a lot of heavy lifting to get us through this first wicket. But we can't keep going through these wickets year in and year out. Maybe you don't clear a wicket one year, because this is real money, this continuity pay.

You know, blended retirement was legislatively mandated. And yet this would immediately impact our retirement counts, my operation capability. It is a legislative change, but I just need the mechanisms, so we don't have to go back year in and year out, but a permanent solution.

But I want to thank you for getting us through this first wicket, but there are many more in front of us.

Mr. HUNTER. It is kind of interesting. The blended retirement is probably more important, I would guess, to the other services. They probably have lower retention than the Coast Guard does. You have guys that get in for 10 years, do eight tours, special forces, then you get out and you get nothing. That is why we fix it on the Armed Services Committee. Probably different for the Coast Guard, in terms of your retention and the burden on your servicemembers, too. I mean——

Admiral ZUKUNFT. That is correct, sir. We enjoy the highest retention of any armed service today. I don't know what tomorrow holds in store for us, but certainly today 40 percent of our recruits who leave basic training are on active duty 20 years later. Sixty percent of our officers.

Mr. HUNTER. That is huge.

Admiral ZUKUNFT. Which is a great return on investment.

Mr. HUNTER. Admiral, thank you very much for being here. And I am going to recognize Mr. Garamendi for closing remarks here.

Mr. GARAMENDI. Admiral, a couple of things. We have talked about icebreakers here. We will go into icebreakers a little more with the second panel.

I am concerned about where the National Academies of Sciences is going with regard to four icebreakers—four heavies, and basi-

cally putting aside the issue of the mediums. We will deal with that in more detail, but just note my concern about that.

Also, you and I have had this conversation—I want to get it on the record—with regard to Buy America. The President talks about Made in America; I want to talk about Making it in America, which means that these icebreakers, as—my goal is everything on that icebreaker is American-made. That may or may not be possible. I want to have a very, very tight window here for purchase of those parts of the icebreaker that are not American-made.

I would like to know your attitude on this, and find out where you think this is going to go.

Admiral ZUKUNFT. Now, that is a great point. And, you know, the frustration I have right now with some of our foreign-made parts, they go out of business. Or you find yourself waiting in line. That is holding up our ability to provide spare parts for the C–27J. Now, granted, we acquired these 14 aircraft, 13 are out there on the tarmac right now. But we are dependent upon a foreign supply chain to be able to outfit these to carry out national security missions.

And so, we need to look at the world around us, which is not exactly breaking out in tranquility. And do we want to be attendant upon a foreign source provider to equip our national assets?

And so I am in lock step with you, Congressman, that, yes, these have got to be built in America so we don't find ourselves—we can't get the parts to keep these platforms running.

Mr. GARAMENDI. Good. The support necessary to build these icebreakers and any other thing really will come from the American economy or American manufacturers spread out across this Nation participating in the construction of these icebreakers or any other pieces of equipment that you need.

Just a couple of final comments, then. I appreciate your testimony. In my opening I was concerned about the information that we receive. I understand that you are told what to tell us. We do need to know what you need without being censored by the Office of Management and Budget. So my specific ask is that we get full information about what is required by the Coast Guard.

I also ask for some information with regard to those portions of the Coast Guard operations that are clearly for national defense, the Department of Defense.

So, if you will get that to us as quick as possible, it would be helpful. We will go forward.

Admiral, thank you for your testimony.

Admiral ZUKUNFT. OK, thank you.

Mr. GARAMENDI. I yield back.

Mr. HUNTER. Admiral, thank you very much for being here, thanks for your service.

Admiral ZUKUNFT. Thank you.

Mr. HUNTER. It is good seeing you, and we will get ready for the next panel.

Admiral ZUKUNFT. OK. Thank you, Chairman.

[Pause.]

Mr. HUNTER. Good morning. On panel—we have saved the best for last, by the way, that's how it works. On panel 2, we will hear testimony from Rear Admiral Richard D. West, U.S. Navy, Retired,

chair of the National Academies of Sciences' Committee on Polar Icebreaker Cost Assessment; Rear Admiral Michael J. Haycock, Assistant Commandant for Acquisition and Chief Acquisition Officer of the United States Coast Guard; Ms. Marie Mak, Director of Acquisition and Sourcing Management with the GAO; and Mr. Ronald O'Rourke, specialist in naval affairs with the Congressional Research Service.

With that, Admiral West, you are recognized to give your statement.

TESTIMONY OF REAR ADMIRAL RICHARD D. WEST, U.S. NAVY, RETIRED, CHAIR, COMMITTEE ON POLAR ICEBREAKER COST ASSESSMENT, NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE; REAR ADMIRAL MICHAEL J. HAYCOCK, ASSISTANT COMMANDANT FOR ACQUISITION AND CHIEF ACQUISITION OFFICER, U.S. COAST GUARD; MARIE A. MAK, DIRECTOR OF ACQUISITION AND SOURCING MANAGEMENT, U.S. GOVERNMENT ACCOUNTABILITY OFFICE; AND RONALD O'ROURKE, SPECIALIST IN NAVAL AFFAIRS, CONGRESSIONAL RESEARCH SERVICE

Admiral WEST. Chairman Hunter, Ranking Member Garamendi, and distinguished members of the subcommittee, thank you for the opportunity to discuss the recently released report, "Acquisition and Operation of Polar Icebreakers: Fulfilling the Nation's Needs." I would like this report and my testimony entered into the record.

My name is Dick West. I am a retired U.S. Navy rear admiral and I chaired the study committee that authored the report for the National Academies. Our report was requested by this committee and focuses on strategies to minimize the capital acquisition and operating costs for polar icebreakers capable of meeting the Coast Guard's mission, including breakout of the McMurdo Station.

For more than 30 years, studies have shown the need for polar icebreakers to fulfill the Coast Guard's statutory missions and to meet our national goals. These studies have indicated an ever-widening gap in the Nation's ability to meet these statutory obligations, protect our interest and maintain leadership in the high latitudes of our Earth.

We recommend building four heavy polar icebreakers owned and operated by the Coast Guard and propose an acquisition strategy that could address these anticipated gaps. We examined leasing options and found them to be more expensive for the Federal Government over the life of the assets.

The first three heavy icebreakers could meet the Coast Guard's requirements to provide a continuous presence in the Arctic, while the fourth heavy icebreaker could perform the annual McMurdo breakout. One of the three icebreakers assigned to the Arctic could also be emergency backup for the McMurdo operation, if it is required.

The recommended acquisition strategy employs block-buy contracting with a fixed-price incentive fee for the four ships and a design for a single class of polar icebreakers. By using a single design, we estimate that the fourth heavy icebreaker would cost less than the first of a medium-class icebreaker.

With our recommended strategy, icebreaker design and construction costs can be clearly defined. A fixed-price, incentive-fee construction contract is the most reliable mechanism for controlling costs for this program. Block-buy authority for this program will need to contain specific authorizing language for economic order quantity purchases for materials, advanced design and construction activities.

Such a contracting program, the economic order quantity purchases enables series construction, motivates competitive shipyard bidding, enables shipyard infrastructure investment, and reduces material acquisition costs, allowing for volume purchase and for timely acquisition of material long-lead items. It would enable continuous production, give the program the maximum benefit from the learning curve, and thus reduce labor hours and costs on subsequent vessels.

Technology transfer from icebreaker designers and builders with recent experience is critical for reducing design and construction costs. In addition, the design should maximize the use of commercial off-the-shelf equipment, apply the polar code, and commercial standards and reduce military specifications to the minimum necessary. Reduction of MIL–SPEC [military specifications] requirements could significantly lower the acquisition costs of each ship with no loss of mission capability.

Importantly, the program's schedule must allow for completion of the design and planning before the start of construction. Our recommended acquisition, design, and construction strategies will control possible cost overruns and provide significant savings in the overall life cycles of the polar icebreaking program.

We recommend that the single design for the heavy icebreakers be made science ready and include sufficient space and margins to accommodate future installation of scientific equipment. The additional design cost is minimal, especially when compared to a subsequent retrofit for that vessel.

Recognizing the *Healy* is halfway through its expected service life, the fourth proposed vessel could be made science capable or fully outfitted for science. The *Polar Star* is well beyond her expected service life. We propose an enhanced maintenance program with the intent of keeping the vessel operational through the delivery of at least the first new icebreaker.

Although extending the life of the *Polar Star* will be challenging, the committee recommends against compressing the design and construction schedule of the new icebreakers, as such an approach may lead to cost overruns.

Mr. Chairman, this concludes my statement. Thank you again for the opportunity to reply and I stand by to answer any of your questions.

Mr. HUNTER. Thank you, Admiral.

Admiral Haycock, you're recognized.

Admiral HAYCOCK. Thank you. I have written testimony I would like to submit for the record and a short oral statement to read.

Mr. HUNTER. Without objection.

Admiral HAYCOCK. Chairman Hunter, Ranking Member Garamendi, members of the subcommittee, good morning. Thank you for the opportunity to speak about the Coast Guard's ongoing

activities to recapitalize our surface, aviation, and command and control capabilities. Echoing the sentiments of the Commandant earlier this morning, I thank you for your oversight and your continued support of our Service.

I am honored to represent 800 military and civilian personnel dedicated to delivering the assets and the capabilities to our operational community. Ten years ago this month, the Coast Guard stood up the Acquisition Directorate. In that time, the Service has strengthened its acquisition management and its support functions, and it has invested in recruiting, training and retaining a highly qualified acquisition workforce. Today, we are seeing strong returns on that investment, and I am proud to share with you an update on our efforts.

First, I would like to discuss the Offshore Patrol Cutter, the Coast Guard's highest acquisition priority. This past year, we awarded a contract for detailed design and construction, which will enable us to build up to nine Offshore Patrol Cutters. We are on track to move forward with an order for long lead-time materials for the first cutter before the end of the fiscal year.

Regarding the heavy polar icebreaker, we are working closely with the Navy through an integrated program office to begin acquiring the Nation's first heavy polar icebreakers in more than 40 years. We have adopted some of the Navy's best practices, including the use of industry studies. In fact, we awarded five industry study contracts in February to identify approaches that can further reduce acquisition costs and production timelines. We've also released a draft system specification for industry review and we are developing a contract solicitation for design and construction on the lead heavy icebreaker.

We are also continuing full-rate production on the National Security Cutter and our Fast Response Cutter classes, moving forward with missionization and upgrades to our fixed-wing aviation fleet, and we are deploying enhanced command and control communications systems nationwide.

The men and the women of the Coast Guard Acquisition Directorate have a lot to be proud of and I am committed to continuing the success that we have achieved since our standup 10 years ago. This means employing each and every tool and resource at my disposal to continue to deliver the best products to our operational commanders at the best price to the taxpayer.

To that end, we are looking at contract authorities that are available or may be available, including multiyear procurement, that can help us take advantage of cost and schedule efficiencies and achieve greater affordability. The Coast Guard also recently received findings in the National Academies of Sciences' Transportation Research Board's Polar Icebreaker Acquisition Operations Study, and I plan to use its findings to inform our acquisition approach going forward.

We greatly appreciate the valuable oversight function performed by this subcommittee and the robust independent assessments provided by Ms. Mak's team at the Government Accountability Office, and Mr. O'Rourke and his team at the Congressional Research Service. Your role in Coast Guard acquisitions success, both in the

past and going forward, is a critical one and we thank you for your support.

The Commandant continues to make fleet recapitalization one of the Service's highest priorities and we are proud of the efforts to ensure our Service stays true to its motto, semper paratus, always ready.

Thank you for your support of the Coast Guard's effort to provide our men and women in uniform with the mission capability they need in the 21st century. I appreciate the opportunity to testify and I look forward to your questions. Thank you.

Mr. HUNTER. Thank you, Admiral.

Ms. Mak, you're recognized.

Ms. MAK. Good morning, Chairman Hunter, Ranking Member Garamendi, and members of the subcommittee. Thank you for inviting me here today to continue our discussion on GAO's body of work on the Coast Guard's recapitalization effort. We value the excellent working relations we have with the Coast Guard, and it is important for me to note that the Coast Guard, for the last few years, has been making progress in addressing GAO's concerns regarding its acquisition portfolio.

However, as the Coast Guard moves forward in managing its multibillion-dollar acquisition portfolio to modernize its aging and maintenance-intensive assets, the Coast Guard is facing several key acquisition planning challenges.

The two areas that I would like to highlight today are, first, the importance of well-formulated planning tools for the Coast Guard to manage its overall affordability of its acquisition portfolio. And, second, the acquisition risks related to the heavy polar icebreaker.

With regard to planning tools, for the past several years, the Coast Guard has submitted to Congress its 5-year Capital Investment Plan, or CIP, intended to provide insight into the proposed budget for that particular fiscal year and the following 4 years. We found that the 5-year CIPs report the assets' total cost and schedule per the acquisition program baseline, however does not account for tradeoffs made in previous annual budget cycles. Furthermore, we have found that the projected funding levels far exceed the amount that the Coast Guard traditionally requests in its annual budget.

In 2014, we recommended that the Coast Guard develop a 20-year fleet modernization plan, which is intended to identify all acquisitions necessary for maintaining at least its current level of service and the fiscal resources to build these assets. The Coast Guard reports that efforts are underway to develop this long-term plan, which the Coast Guard is calling a 20-year CIP. But to date, it is unclear when this plan will be completed and what level of detail it will contain.

However, in line with the Office of Management and Budget's capital planning guidance, we would expect this 20-year CIP to include, among other things, a review of the portfolio of assets already owned by the Coast Guard and those that are in procurement, the capabilities necessary to bridge the old and new assets, and the justification for new acquisitions proposed for funding. The most recent unfunded priorities list that you referred to earlier is a good start at identifying more of the Coast Guard's needs that

have been delayed, and we hope to see those and more in the 20-year plan.

A long-term plan that also includes acquisition implications, such as sustainment costs, support infrastructure and personnel needs would further enable tradeoffs to be identified and addressed prior to making irreversible commitments, and ensures the maintainability of these assets.

Second, while the Coast Guard has made progress in advancing the acquisition for three heavy polar icebreakers, the accelerated schedule it is pursuing poses risk. To meet this schedule, the Coast Guard is partnering with the Navy to leverage its expertise and reduce costs. This acquisition, according to Coast Guard officials, is considered one of its high-priority programs. However, such an acquisition would be difficult to afford while it builds the Offshore Patrol Cutter, which would take anywhere from one-half to two-thirds of the Coast Guard's acquisition budget starting in 2018. If funds come primarily from Navy appropriations, as was being considered, additional risk and concerns associated with the actual contracting process exist, with the Navy using the Department of Homeland Security's acquisition process. But as this committee mentioned earlier, if this is off the table, the Coast Guard's affordability concerns just multiplied significantly, if funding stays where it historically has been the last several years.

The Coast Guard faces some difficult and complex decisions with potentially significant cost and mission implications. Without completing this 20-year plan, the Coast Guard will continue, as it has in recent years, to plan its future acquisitions through the annual budgeting process, a process that has led to delayed capabilities. A comprehensive, long-term strategic plan would provide timely information to decision makers on how best to allocate resources in a constrained budget environment to build and maintain a modern, capable Coast Guard fleet.

Chairman Hunter, Ranking Member Garamendi, members of the subcommittee, this completes my prepared statement. I would be pleased to respond to any questions you may have.

Mr. HUNTER. Thank you, Ms. Mak.

Mr. O'Rourke, good to see you. You're recognized.

Mr. O'ROURKE. Chairman Hunter, Ranking Member Garamendi, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss Coast Guard's sea, air, and land capabilities. As requested, my testimony focuses on Coast Guard ship acquisition.

Mr. Chairman, with your permission, I would like to submit my statement for the record and summarize it here briefly.

Mr. HUNTER. Without objection.

Mr. O'ROURKE. Coast Guard officials have begun stating regularly that executing their acquisition programs fully and on a timely basis will require an AC&I [acquisition, construction, and improvement] account of about $2 billion a year. Past Coast Guard statements have sometimes put the figure as high as $2½ billion. That would represent a big increase over recently requested levels. It can be noted, however, that the requested funding levels for the Navy's shipbuilding account have increased by about $6.8 billion

per year, or by about 50 percent, during the period of the Budget Control Act.

A common practice is to assume or predict that an agency's funding levels in coming years will likely be close to where they have been in previous years. For the Coast Guard, which goes through periods with less acquisition of major platforms followed by periods with more acquisition of major platforms, this might not always be the best approach, at least for the AC&I account.

Moreover, in relation to maintaining Congress' status as a coequal branch of Government, an analysis that assumes or predicts that future funding levels will resemble past funding levels can encourage an artificially narrow view of congressional options regarding future funding levels, depriving Congress of agency in the exercise of its constitutional power to set funding levels and determine the composition of Federal spending.

The Navy in recent years has used multiyear procurement and block-buy contracting to procure more than two-thirds of all the ships shown in the Navy's 5-year shipbuilding plans in recent years, saving billions of dollars in the process. In contrast, the Coast Guard has made zero use of multiyear contracting for its shipbuilding programs.

Using multiyear contracting might reduce the OPC program's cost by about $1 billion, which is roughly the cost of a polar icebreaker or a 35-ship inland waterway tender program. This potential savings of $1 billion represents a once-in-a-generation opportunity for using multiyear contracting to reduce the cost of an individual Coast Guard acquisition program by such an amount.

The Coast Guard currently is using a contract with options for acquiring the first nine ships in the OPC program. A contract with options is not an example of multiyear contracting. Contracts with options operate more like annual contracting and they don't achieve the savings that can be achieved through multiyear contracting. Acquiring the first nine ships in the OPC program under the current contract with options could forgo roughly $350 million of the $1 billion in potential savings.

One option for the subcommittee would be to look into the possibility of having the Coast Guard replace the current OPC contract at an early juncture with a block-buy contract.

The planned OPC procurement rate of two ships per year would deliver OPCs many years after the end of the originally planned service lives of the existing Medium Endurance Cutters. The Coast Guard has said it plans to extend the service lives of the Medium Endurance Cutters to bridge the gap. A possible alternative would be to increase the OPC procurement rate to 3 or 4 ships per year, which could reduce their cost and accelerate the delivery of the 25th OPC by 4 to 6 years. There are various potential options for increasing its procurement rate to three or four per year.

Using a block-buy contract could reduce the cost of a three-ship polar icebreaker procurement by upwards of $200 million. The savings on the four-ship acquisition recommended in the National Academies' report would be greater. And the savings on a five- or six-ship procurement would be greater still and could exceed $400 million.

And Mr. Chairman, you brought up the issue of whether the lead ship should be under that contract. I would be happy to talk with you about that during the Q&A, if you would like.

The Coast Guard has testified that the new inland waterway tenders might cost about $25 million each. Using that figure, a 35-unit replacement program might cost roughly $875 million. That cost, too, might be reduced through multiyear contracting. Numerous U.S. shipyards, including yards not capable of building the Coast Guard's bigger and more complex cutters, might be interested in bidding for this program.

Mr. Chairman, this concludes my remarks. Thank you again for the opportunity to testify and I look forward to the subcommittee's questions.

Mr. HUNTER. Thank you, Mr. O'Rourke.

Let's start. We gave the Coast Guard block-buy authority last year, I think. Right? Was it last year, Admiral Haycock? Last year, I think?

Admiral HAYCOCK. I believe that is accurate, yes.

Mr. HUNTER. So would you speak to what Mr. O'Rourke just said of why you didn't do a block buy for the OPCs?

Admiral HAYCOCK. For the OPCs or the FRCs?

Mr. HUNTER. OPCs.

Admiral HAYCOCK. OPCs. The——

Mr. HUNTER. That is what you referred to, right, Mr. O'Rourke?

Mr. O'ROURKE. That's right.

Admiral HAYCOCK. The OPC contract we awarded last September. That contract is well on its way in terms of all the preparations and things. Making changes that late in the contract would probably have been detrimental to getting it awarded. So we didn't do it on the OPC.

There are opportunities in the future, as Mr. O'Rourke has indicated, to actually block buy on the OPC and we are look at——

Mr. HUNTER. How much money would you save if you would have done a block buy with those? The first nine, you say? You bought nine, right?

Admiral HAYCOCK. Yes, sir.

Mr. HUNTER. Starting with nine, how much money would you have saved if you had done a block buy?

Mr. O'ROURKE. My estimate is that there is more than $300 million of savings over those nine ships that the Coast Guard is currently on a track toward forgoing. You could recapture much of that savings by putting most of those first nine ships under a block-buy contract, rather than simply waiting for that contract to be fully implemented over several years and then starting with ship 10.

Mr. HUNTER. Let's just stay on this. Why would you not do that? I think this is kind of indicative of what happens with the Coast Guard in general, and why we put these authorities in there, for you to have the authority to purchase ships like the Navy does. This is why we put it in there. And so your argument was—not yours, but the Coast Guard's argument was 4 years ago or 3 years ago, we don't have the authority, we don't have the authority. So we have to spend money that we don't have, basically, and not save.

So we gave Coast Guard the authority. So they are just like the Navy now. And then once they had the authority, you chose to not use it. I mean, $300 million is, for the Coast Guard, a lot of money.

Admiral HAYCOCK. Yes, sir. It is not that we are choosing not to use it. The Coast Guard, we want to save money, Mr. Chairman. And we consider ourselves to be good stewards of the taxpayers' dollars. The issue is that it is a very attractive opportunity, but it also underplays some of the risks involved. So the Coast Guard is open to any techniques and tools out there. Multiyear, block buy, we are considering all those tools. And we haven't necessarily ruled any of them out. It is not that we are intentionally not using them. We want to make sure that we don't get ourselves in a situation where the risks outweigh the benefits.

No one wants an acquisition to go south. It is a——

Mr. HUNTER. Would you explain how the risks outweigh the benefits?

Admiral HAYCOCK. So some of the risks that we see is you are essentially—you are all in, is what it comes down to. You are basically saying, I want a block buy for, say, for OPC, nine hulls, nine cutters. And then if things aren't going well, you are kind of stuck, you are committed.

Mr. HUNTER. What do you mean, if things aren't going well?

Admiral HAYCOCK. As you know, every acquisition has challenges. There are challenges in design, there are challenges in production. There are things that you can kind of foresee coming and there are things that you can't foresee coming. And that is why you have acquisition professionals, highly trained people executing the acquisitions.

So there are things that you just don't see, especially on a first in class. And I know Mr. O'Rourke's position is it is a good tool for first in class. We are not necessarily saying that that is not the case. But our experience with first in class is, the first in class oftentimes doesn't look like the rest of the fleet.

Mr. HUNTER. I would offer, too, that the Coast Guard's shipbuilding hasn't been stellar. So what you see as first in class not being right and what the Navy does are two different things, we are trying to—what is different with the way you build ships and the way that the Navy builds ships? Is there special Coast Guard sauce or something? I mean, what is the difference between the Navy building ships and the Coast Guard building ships?

Admiral HAYCOCK. Not an awful lot, sir.

Mr. HUNTER. Then why not do what the Navy does?

Admiral HAYCOCK. We are looking at that.

Mr. HUNTER. OK, if you are looking at it, you are not doing it. Right? I mean, 300 million bucks, again, is a lot of money. That is going to lead into—do you know what the numbers are for your backlog on shore improvements and maintenance, right, and upkeep? What is that? It is a total of like $1.4 billion, $1.6 billion? It is like $700 million and then another $800 million or something like that?

Admiral HAYCOCK. It is big, yes, sir.

Mr. HUNTER. OK. So let's switch really quick. I don't want to monopolize just on the one ship, on the OPC. What do you plan on doing with that? How do you plan on paying that?

Admiral HAYCOCK. For?

Mr. HUNTER. How do you plan on paying the backlog and doing your shore facility upkeep, along with all the acquisitions?

And you can't see this chart, but it basically shows which lines of ships are going to be completed when. And as you can see, the dotted line there, the gray goes up above that. Again, that is where you don't have the money to do what you say you are going to do.

Admiral HAYCOCK. As I think this subcommittee has recognized, Mr. Chairman, is the budgets that we get for OE and for acquisition are not what they need to be. As the Commandant has previously testified, we need an annualized 5-percent increase in our OE maintenance accounts, we need $2 billion in acquisition accounts to do all the things we need to do.

We don't have the funding, so we have to prioritize. So that is what we do. We go through and prioritize, look at the things that impact missions most and try to get those accomplished first. So that is the process we use and we will continue to use.

Mr. HUNTER. So lastly, before I go to Mr. Garamendi, and Ms. Mak, I would like you to answer this, too. At what point do you realize that you have to plan for real life, as opposed to planning for non-real life? Because when you gave your fleet mix analysis, I think, 2 or 3 years ago, it was great. That is what we would like to see, is what you want, without it being screened or changed by anybody. That is what we would like to see, so we know at least what do you need to accomplish the mission, if you got 100 percent of what you wanted, right? Then you come back and say, we are not able to do that because this gets scrubbed, and here is the reality of the budget and here is what we are going to get.

At what point do these charts start matching? Meaning, at what point do you start planning for what you actually get? Right now, are you planning for what is unattainable, because there is no money for it. But that is your plan. Your plan is to do something that is not possible. So at what point does the Coast Guard put its hands in the air and start planning to what the actual monies you get? Does that make sense?

Admiral HAYCOCK. It does. And, Mr. Hunter, that is what we are doing now. Under our current Commandant, he has asked us to be bold and look at what we really need to do the job and ask for it. And that's what we're doing.

Mr. HUNTER. But your 5-year plan is short. Meaning, you don't have enough funds for your 5-year plan, let alone your 20-year plan. Is your 20-year plan going to fall within real life budgets, or is it going to go way up while your money stays straight?

Admiral HAYCOCK. I am not certain, because the plan is not complete. We are still working that.

Mr. HUNTER. Is the 5-year plan indicative of what the 20-year plan is going to look like? Because the 5-year plan is unattainable, too.

Admiral HAYCOCK. The 5-year plan is the—it is the 2018 budget, essentially. And it is, it is constrained. Those are essentially the rules that we work under, sir.

Mr. HUNTER. OK. Mr. Garamendi, you are recognized.

Mr. GARAMENDI. Mr. O'Rourke, you argued strongly for a block buy. Ms. Mak, your opinion of block buy, working off Mr. O'Rourke's testimony?

Ms. MAK. Thank you. We don't believe it is wise to use block buy for the icebreaker, let me clarify. Block buy is an effective contracting mechanism in certain circumstances. In this particular case, we don't agree that this approach is valid for the same reason using multiyear is not allowed for lead ships.

When you use multiyear, the statutory criteria include stable requirements, for example, design maturity and also proof of substantial savings. None of those have been proven especially with this first polar icebreaker being built in the U.S., a ship that has not been built in over 30 years. There are a lot of things at risk that has to be worked through with the design and build of the first heavy icebreaker until the design is stabilized.

Based on our shipbuilding work, it generally takes three to four ships before the requirements in design get stabilized. Given that the number of heavy icebreakers is only expected to be three at this point, we are not advocates of using block buy for this particular acquisition.

Mr. GARAMENDI. Is there another option, besides block buy, as a way of moving towards three or four ships?

Ms. MAK. Annual contracts with options will work, and can produce savings. We have just shown that in the FRCs as well, and it also gives you more congressional oversight. Once a contract is let, every year, if you have the options, if things go wrong, you can always pull back. Whereas, with a block buy, you can't pull it back once it is paid for. Ordering long-lead materials ahead of time locks the Coast Guard in.

Mr. GARAMENDI. Mr. O'Rourke, counter?

Mr. O'ROURKE. Yeah. There are arguments on both sides of this. The admirals and now Ms. Mak have presented the arguments for being cautious about using block buy, especially with a lead ship. Let me present the arguments on the other side, so that you can have a balanced presentation.

The first is that block buy was invented precisely so that you could use it on the lead ship in a program and the earliest ships in a program. The second argument is that the Navy, in fact, has done this with its own shipbuilding programs. They did it with the *Virginia*-class submarine, which is a ship that, with all due respect to the Coast Guard, is a lot more complex than an icebreaker, and the Navy is expected to even do this on its *Columbia*-class ballistic missile submarine, which again is a very complex ship and also a ship of a type that we have not built in decades.

Thirdly, the shipyards in this country that are working toward this program are also working with the Europeans to import their design know-how, and that will mitigate the design risk on this.

Fourth, as the GAO itself has testified in the past, it is a best practice in shipbuilding to bring the design of the ship to a high stage of completion before you start building it. In fact, if you have not done that, you probably shouldn't be building the ship under any contracting arrangement at all. So if the ship has been brought to a high stage of design completion, you have mitigated the risk associated with the lead ship. In other words, the idea that lead

ships present this kind of design risk is a lesson learned from the past that reflects earlier, not current, best shipbuilding practices.

Three more arguments. If you do a block-buy contract, it can be, and the National Academies' report recommends, that it be a fixed-price incentive contract. That is protecting the Government against the risk of cost growth.

Secondly, if there is a need to make changes in the design of the lead ship, you would then want to measure the cost of making those changes, which should be relatively minor if you have developed the design to a high stage of completion, against the savings that you are forgoing by not having that ship under a block-buy contract.

And then seventh and lastly, it is not correct that you can't stop a block-buy contract. You can, and the cancellation penalties that the Government would need to pay under that contract are less than they are under a multiyear procurement contract.

So again, there are two sides of this. And the admirals and Ms. Mak have done a good job, I think, of presenting the arguments on that side. So for the sake of balance, I've given you seven arguments on the other side.

Mr. GARAMENDI. Well, I guess we are going to get to decide.

Admiral West, could you opine on this question?

Admiral WEST. Yes, sir. I have to add that we had five members of our committee with extensive marine architecture and marine shipbuilding experience, you know, generations of expertise. And they are convinced the block buy is the way to go with the ice-breaker. We also heard from retired shipbuilders and shipyard owners who also agreed with us.

Because we haven't built one in a long time, but the design is fixed if you have the design. It is not a complicated mission. They are doing it internationally now. The designs are out there. We are not going to add anything later. There is no R&D involved with the design, and we think it fits the block-buy concept.

Mr. GARAMENDI. I appreciate that.

I think there is another factor involved in this, and that is from the point of view of—I will speak for the Coast Guard here—they have absolutely no idea what Congress is going to give them year to year. And therefore, the block buy is a concern.

Ms. Mak, you are nodding your head as if that might be correct. Is that correct? Is that a factor here?

Ms. MAK. Absolutely. Because if you pay the money to purchase other components earlier and the other ships are already in construction, you are locked into using those components unless, like Mr. O'Rourke mentioned, if the contract gets canceled, you have to pay a cancellation fee at some point.

Also, I would like to note that it is a bit early to discuss what contracting type the Coast Guard is going to use, when they haven't finished all the acquisition paperwork. I think more is at risk in the detailed design, cost estimates, all of those documents that are required to be done before a contract is awarded. And some documentation is required to be done by the end of this fiscal year, to be able to award the contract in fiscal year 2019.

Mr. GARAMENDI. I suppose it is time for me to opine, also, if I might. First of all, I like the idea of a block buy because it does

commit the Congress to the future. And if we need three or four icebreakers, then we need to be committed. And if we can do that. Now, the next question really has to do with the nature of the contract itself, how you write into that contract the possibility of design changes. I suspect that there are designs and designs. There is the basic design, what this thing is going to look like, the hull and the rest, and then there are other things that will probably change over time. For example, there may be engine issues or the like, and those can be written into the contract. So my opinion, block buy.

Now, the question is three or four?

I'm out of time——

Mr. HUNTER. Keep going. There's no objection——

Mr. GARAMENDI. There being no objection, I will continue on.

The National Academies recommended four rather than what we were looking at before, three heavies and three mediums. Can you get into this in a little more detail, Admiral West, and what happens to the other two ships? Can we get by with four or do we actually need six?

Admiral WEST. We came up with four for two reasons. One is the acquisition strategy, making it more robust, and there are all sorts of reasons why you will get shipyards more engaged if they know they are going to build more than one.

The second was we looked at the mission, the High Latitude Study and the operational requirement the Coast Guard had come up with and we saw the presence, the one hull presence in the Arctic and we saw the McMurdo breakout and we said, you need four ships to do that. And that is the minimum we recommend.

You can go on from there. At some point, your learning curve that each ship is cheaper will level off at some point, four, five, six down the way. You may want to change at that point. But clearly, we thought that the four large were the best investment of public money for the mission right now.

Mr. GARAMENDI. So it kind of comes down to, if you're going to build an icebreaker, build a heavy because it can do the job of the medium as well?

Admiral WEST. Build an icebreaker to go break ice. Yes, sir.

Mr. GARAMENDI. You also spoke to the operational costs, that the operational costs of a new icebreaker are significantly less than the existing icebreakers. But the difference between the operational cost of a heavy icebreaker and a medium icebreaker, did you take that into account.

Admiral WEST. We did. And I don't have the exact figures, but there is not much difference. I mean, the *Healy* is a very large ship. In fact, it is a little bit bigger than the *Polar Star*. So it all depends on how much mission you put on that ship and how many people you put on it and who you embark. But the operating costs are not that much different.

Mr. GARAMENDI. And am I correct, you also recommended that all of the ships be designed for scientific purposes, but that not every ship be equipped for scientific purposes?

Admiral WEST. We decided that if a ship was going to go where no other ship can go, and to regions where we don't know a heck of a lot about the oceans, that it ought to have a science capability.

So in the original design, there should be a science capability designed into it for weight and space moment, and then—which turned out to be relatively cheap, we were surprised, as we costed that out, if it is in the original design. Rather than trying to retrofit something later on. And then if you want to outfit it, then you add the equipment later on.

Mr. GARAMENDI. It seems to me that the scientific—that if we designed the ship for scientific purposes, that the scientific equipment ought to be paid by the scientific organizations.

Admiral WEST. Our option allows that. A science-ready ship is roughly $10 to $20 million in the design itself. Putting the equipment on board is an additional cost, obviously, and can be charged to whoever.

Mr. GARAMENDI. Whoever wants to do that.

Admiral Haycock, what do you opine on the issues of block buy and this scientific—four versus six?

Admiral HAYCOCK. Thank you. First on the block buy, as Mr. O'Rourke had indicated that Ms. Mak and I had mounted a defense, my intention is not to mount a defense against block buy. That is not my intent.

The subcommittee asked me why we seemed reticent. I just want to throw out there, if we have some reticence, it is because we want to make sure we have covered all the risks. It is clear that Mr. O'Rourke and this subcommittee are trying to avail the tools, such as block buy for the Coast Guard's use, and we are excited and we appreciate that. And we are open to that and we are looking at that.

So we owe you a report in December on block buy and we will get that to you on time and that will help explain some of those things. But we are open to using block buy multiyear and we are excited about those opportunities.

Regarding science, one of the things that we have been trying to do for the last 9 months, since we teamed up with the Navy with our Integrated Program Office, is make the icebreaker affordable. So we have taken a hard look at all the things that the icebreaker is supposed to do and all the equipment and structure and stuff that needs to be put in place to do that. And so we have worked hard to reduce the cost of the icebreaker.

I think the initial cost estimates were a little over $1 billion. And our efforts within the Coast Guard, with CG–4, our tech authority for ship design and engineering and production, we have been able to reduce the cost of the icebreaker by about $200 million so far, and we are still working on that. And our industry studies, as we work with industry and learn more, we are optimistic we can bring that cost down further.

One of the things that we have done is we have looked at things like science. And so the icebreaker, as currently designed from the Government's indicative design perspective, has space, weight and power reserved for changes that might occur in the future for the Coast Guard's icebreaker mission. That might be science, it might be a weapons system. Might be whatever the Nation needs the icebreaker to adapt to, that is the secret behind our getting ships to last 50 years is we build them flexibly, or we build flexibility into the design.

Mr. GARAMENDI. And you expect this detail to be available the last half of this year?

Admiral HAYCOCK. I am not following you, sir.

Mr. GARAMENDI. The actual design of the icebreaker, power, equipment, science equipment, all of that, or science space, and you expect all of that to be designed and prepared for review by the end of this year?

Admiral HAYCOCK. We have an internal design we are working that enables us to determine whether we can meet requirements and to help us estimate costs and such. The intent is not to release that to industry, because we want industry to come forward with creative and innovative solutions in their designs. I don't know if that answers your——

Mr. GARAMENDI. I am really getting to the point, when do we get to see what you want to do and when can we review that?

Admiral HAYCOCK. I am going to take that back and figure that one out, sir. You know, the design continues to mature and we are still——

Mr. GARAMENDI. I was looking at your schedules and it looks to me like by the end of this year, you would expect to have the design completed and ready to go to contracts early next year?

Admiral HAYCOCK. I understand. So what you are asking is, at what point in time will we be ready to go on contract for the detailed design and production? So the design the Government is working, the indicative design is more of an estimating tool and the ability to put reasonableness into our requirements and verify the requirements are correct and that sort of thing.

What we intend to do is get a request for proposals out later next fiscal year, toward the middle of the fiscal year. That will be a sign to industry that we need them to submit proposals. With those proposals, we anticipate there would be designs. And then we would award a contract and then industry—the team that wins would actually go through and actually formalize that design, make it final and make it ready for production.

[The information from Rear Admiral Haycock of the U.S. Coast Guard follows:]

> In FY18, the Coast Guard will release the Request for Proposal (RFP) which contains the requirements that will drive the detail design for the Heavy Polar Icebreaker. The Coast Guard will then review the design submissions submitted by industry in response to the RFP. In FY19, through a full and open competitive process, the Coast Guard will award the Detail Design and Construction contract to the industry team that will complete the design. The Heavy Polar Icebreaker design will be shared with CG&MT, NAS, GAO, and CRS once the Detail Design and Construction contract has been awarded.

Mr. GARAMENDI. Mr. Chairman, thank you so very much for the additional time. Just a final comment.

A couple of decisions are going to have to be made by us, as I look at this. That is, are we going to go to four heavy icebreakers or three and three. Right now, I think, presently, we are looking at three and three, so this will be a change, as I understand where we are.

Secondly, there is the final—I am not sure of the word "final," but the design of the icebreaker itself should be available sometime in the next 6 months, correct? And if that is the case, then I would

think that Ms. Mak and Mr. O'Rourke and Rear Admiral West would like to take a look at that and give us their opinion as to whether this is the proper design, and then we would authorize either a block buy or some other mechanism for the ships.

So this is kind of, looking at our own work schedule out ahead, the kind of things, the decisions that we are going to have to make.

And then there is this issue, much larger issue that we are going to have to deal with, and that is the overall budget for the Coast Guard, both for its acquisitions as well as for operations.

With that, Mr. Chairman, thank you so very much for the additional time.

Mr. HUNTER. Thank you, sir.

Mr. DeFazio is recognized.

Mr. DEFAZIO. Thank you, Mr. Chairman.

Admiral Haycock, you know, I just want to follow up on something you said. You're saying the first in class, you know, might meet specs but often what comes after that is not so great. I mean, don't we write contracts well enough that if they don't meet the specifications on the second ship that they don't get paid? What kind of contracts does the Government write here? I know the 110 contracts, boy, that was pretty poorly written. I don't know why the Government can't protect the taxpayers better.

So why would you say well, gee, we are concerned because the first in class might meet specs and be great but after that they are going to create some crap and we're going to have to pay for it?

Admiral HAYCOCK. I think my comments may have caused you to misunderstand.

Mr. DEFAZIO. OK.

Admiral HAYCOCK. It is not that the first in class is good and everything that follows is not. It is actually, it is the opposite. The first in class is a challenge, because it is the first one you have built——

Mr. DEFAZIO. Right.

Admiral HAYCOCK [continuing]. There is a lot of learning that goes into it.

Mr. DEFAZIO. Yeah, but if it comes out well in the end?

Admiral HAYCOCK. We almost always find ways to improve it and to make it more effective and more efficient and usually affordable. So the follow-on ships become better and better as they go along. Usually the first in class——

Mr. DEFAZIO. But couldn't the contract allow for design changes that are within certain parameters? I mean, you are not totally redesigning the ship between 1 and 2.

Admiral HAYCOCK. That is accurate, sir. Yes. The contracts are written to provide that sort of flexibility. We don't completely redesign or rewrite things.

Mr. DEFAZIO. Yeah. But, I mean, you could anticipate that?

Admiral HAYCOCK. Absolutely.

Mr. DEFAZIO. Now, Admiral West, apparently Admiral Zukunft did answer a question I had, which is are the Russians militarizing some of their icebreakers. And the answer was yes. And my question is, I saw that analysis where you could save a lot of money, but it is an irrevocable decision. I mean, once you have not milita-

rized the icebreakers, then you are out of luck unless you want to build a different ship or a pretty much dramatically changed ship.

Don't you believe that at least some of these icebreakers should be militarized? I mean, given the potential for conflict in the Arctic?

Admiral WEST. I am not sure, sir, to be honest with you. I know in the operational requirements that I saw, the Coast Guard's 2015 ORD, there was some small armament there, the ability to ward off ships and take on small ships. I think you have a whole different design if you want to make it a warship and not an icebreaker. So I am not sure——

Mr. DEFAZIO. I am not necessarily talking about a warship that is designed for warfighting, but something that is robust enough and has defensive capabilities. You know, in World War II, we were dumping, you know, mines off the backs of, you know, ships that weren't armed or were lightly armed, to try and get the German U-boats. I mean, some sort of capability. I mean, if we are having to lead a convoy or something through the Arctic, you know, escort ships would have to be provided. They are going to have to follow. And then if they get the icebreaker which is, you know, whatever, lightly armed or doesn't have defensive capabilities, then they are in a tough spot.

Admiral WEST. I think the operational concept for an icebreaker in a wartime environment is an interesting study that should be done.

Mr. DEFAZIO. OK.

Admiral WEST. But right now, the ships that are being designed do not have that capability.

Mr. DEFAZIO. OK, all right. Study that needs to be done. All right, that is something to take under consideration. Thank you. Appreciate it.

Mr. HUNTER. I thank the gentleman.

Let's stay on this. Again, DoD has made it clear that there is no national security, national defense requirement for an icebreaker. So why would you militarize it? I understand what the ranking member's point is. But the Department of Defense, General Dunford, I have asked him this. And he said there is no requirement in any operational plan anywhere in the world for an icebreaker.

Go ahead. Please, comment, opine.

Admiral WEST. I can't add to that, sir.

Mr. HUNTER. Admiral Haycock?

Admiral HAYCOCK. Mr. Chairman, I don't know that I can state it any better than the Commandant did in the first testimony. I don't understand why people don't see it that way. The Coast Guard has been doing defensive or national defense-related missions since 1790, as the Commandant has indicated.

[The information from Rear Admiral Haycock of the U.S. Coast Guard follows:]

The U.S. Coast Guard does not typically charge the Department of Defense (DoD) for "Defense Operations" missions (i.e., RIMPAC deployment of WMSL is not reimbursed). Over the past 5 years, the Coast Guard Icebreaker *Polar Star* has supported the DoD "Joint Task Force-Support Forces Antarctica" as part of Operation DEEP FREEZE.

Upon crossing 60 degrees South Latitude, Polar Icebreakers enter the Antarctic treaty zone. At that time, Polar Icebreakers shift tactical control to PACOM, specifically Joint Task Force (JTF)-Support Forces Antarctica. Below is a table of total days each year (previous 5 years) the Polar Icebreakers shifted tactical control (TACON) to PACOM.

Year	2013	2014	2015	2016	2017	Avg	Total
Days	0	31	45	41	35	38	152

In the Arctic, the Coast Guard Icebreaker *Healy* has conducted missions to support Naval Research Labs and other defense science and technology research. These deployments are classified as "Ice Operation" missions, although they are in support of DoD. In 2016, *Healy* conducted 33 days of these operations, while in 2017 she conducted 50 days.

Mr. HUNTER. And I am saying, according to the Department of Defense and the Chairman of the Joint Chiefs of Staff and the U.S. Navy, there is no military requirement right now for an icebreaker. That is just for an icebreaker by itself, let alone a militarized icebreaker.

Admiral HAYCOCK. I don't know what else to tell you, sir. The Commandant made his comments earlier. I don't know why the Department of Defense doesn't see it that way.

Mr. HUNTER. Admiral West, let's go back to what you said about military design. Specifically, what things would you have that is more militarized than what would be commercial? What would you pull out of the MIL–SPEC requirements?

Admiral WEST. I think you have to first start—what is the threat you expect up there? I mean, it is just like we do with our warships. What do you want? Is it antisubmarine warfare, is it AA warfare? What is the threat? And then you have to build in that capability into the ship.

I think that is an interesting study. What is the threat up there?

I know the Russians are building ice-hardened combatants. I think the Canadians are building a *Harry DeWolf*-class ice-hardened combatant of some type. So there are people who are looking at combatants in the Arctic region, and we certainly should look at that.

I don't think we did look at it when we designed the current icebreaker. But I think it is a good study to look at.

Mr. HUNTER. Would you think, I mean, is that the Coast Guard's role to look at that or the Navy's role to look at that?

Admiral WEST. I think it has to be both. I mean, usually the comms suite, the weapons suite that are provided to cutters as warships come from DoD, so it is a common—an issue that they should do together.

Mr. HUNTER. But that study, that would be done by the Navy?

Admiral WEST. I think it ought to be done by both of them.

Mr. HUNTER. Ms. Mak, I want to come back to you. Ms. Mak, I asked you earlier at what point, and I forgot to get your answer, at what point does the Coast Guard start planning for real life to meet their actual budgets? As opposed to asking for everything under the sun and then having graphs like this where there is never enough money to meet their acquisition timeline and schedule.

Ms. MAK. I believe a 20-year plan hopefully will start addressing that, because that forces the Coast Guard to lay out more than the assets that are needed and are shown in the 5-year plan. For instance, the 5-year plan doesn't cover quite a few other assets. And when you go further out with strategic planning, it has to cover more assets and be able to lay out those tradeoffs that have to occur if we don't have the funding to procure certain assets. And that is why we have been advocating for a 20-year plan. Because that forces the Coast Guard to lay out all the assets that are needed, all the resources that are needed, and then lay out tradeoffs.

I know the Commandant said earlier that DHS and OMB make certain cuts. And agreed, they have to prioritize. But we have spoken to DHS and OMB since the last hearing and they also acknowledge as long as the Coast Guard lays out this 20-year plan within the budget constraints, then the Coast Guard can say, if we stay at $1.2 billion for acquisitions, this is what doesn't get done. DHS and OMB agreed to that. They don't have a problem with listing out all their needs. Whether they get funded or not is a different issue, and that's the Department's call and OMB's call.

Mr. HUNTER. Let's go back, really quick, Mr. O'Rourke, about block buy on the icebreaker. Let's go through it slowly. Because we have arguments on each side of this.

The icebreaker is not a complicated ship. I think that is—I do my little hand movements of what an icebreaker does. It hits stuff, then it goes down, then it backs up, then it hits stuff, then it goes down and it backs up and it hits stuff, so on and so on, ad nauseam. That is what an icebreaker does.

To me, it is almost besides the technical aspects of bending really thick steel and the way that the boat is designed. Beyond that, it is a very untechnical ship. So could you speak to that? If you were to do a block buy, starting with the first ship, whether it is going to be partially militarized or not, and that is decided upon beforehand, can you go through the risks associated with it if you don't start, as we are all saying, until you have 100 percent design and you have all of the materials, at least for the first couple ships, and if this can save you $1 billion by block buying the three, what are the risks associated with that?

Mr. O'ROURKE. Right, there is some complexity in the icebreaker. It is more complex than something like a sealift, a military sealift ship that would be similar to a commercial cargo ship. But it is not a highly complex ship. We are not talking about, you know, a submarine that goes down to a pressure depth and has a nuclear reactor on board and also a lot of weapons and complex electronics. So it is not a highly complex ship.

Furthermore, there is a lot of design know-how available on icebreakers. Even though they have not been built in this country in some time, a lot of other people have been building them all along and they have accumulated quite a lot of design know-how. And the shipyards in this country that are interested in this program have access to that and they can choose to partner——

Mr. HUNTER. They would partner with——

Mr. O'ROURKE [continuing]. With these, and some of them already have. You can import that design know-how into it to mitigate the risk.

But lastly——

Mr. HUNTER. Stop there, though. Your point there, I think, needs to be made. It is really not a first-in-class ship. It might be for us, but it's really not.

Mr. O'ROURKE. Not for——

Mr. HUNTER. If you bring over the Norwegians and they are in your yard with you and they look at everything, it is really not a first-in-class ship, it is number 27; it is just being built in a U.S. yard, as opposed to a Norwegian yard.

Mr. O'ROURKE. To the extent that you follow a foreign design, yeah, that becomes more and more true. It depends on exactly how much of the foreign design is incorporated into the U.S. design.

But as a matter of philosophy, if you think there is risk in the design of that ship, you shouldn't be building it anyway. Best practices are to develop the design to a high state of completion and confidence in that design before you start bending metal. This is one of the major lessons of shipbuilding, and it is not a new one; it goes back some number of years.

So if you think there is risk in that design, then why are you contemplating even starting the construction of that ship under any circumstances?

But lastly, let's say you need to make some changes in the design as you work your way through the construction process. What is the cost of making those changes and how does that compare to the savings of having put that ship under the block-buy contract? That is what you need to weigh. There may be some changes you want to put onto that first ship and that may cost you some amount of money. But that cost could be a lot less than the savings that you will give up by not putting that ship under the block-buy contract in the first place. And I think that needs to be weighed in the balance.

If you build the first ship outside the block-buy contract and then wait until it is complete, you will not only—before committing to a block buy for the follow ships, you will not only forgo the savings on the first ship, you will then put an interval between that first ship and the second ship that will give you a loss of learning and a poorer production learning curve, and you will lose savings moving from ship number 1 to ship number 2, as well.

Mr. HUNTER. What I am kind of seeing here, and this is just me being a conspiracy theorist, but after watching the Coast Guard for a couple of years, if you do a block buy or a multiyear contract, basically you are—and it is approved, the Coast Guard is getting a long-term commitment by the Government, by OMB, by the Department of Homeland Security and by the appropriators, by this Congress. That is what a block-buy contract signals, number one. Not only is it just good fiscally, but it signals a long-term funding commitment to you guys.

I think that is why you didn't use it for the OPCs. I think that's why. I don't think that OMB wants you to have a long-term show of faith from the Government. Because if you do that, then they are going to be 100 percent committed. Because that is what a block buy is, right?

Would you like to speak to that, Admiral Haycock?

Admiral HAYCOCK. Yes, sir. The thought of having a commitment to building three or four or six or however many icebreakers is exciting and, you know, we are looking forward to that. I think the thing that we need to keep in mind is it is not just the OMB or the Department that has signed up for the commitment, it is also Congress, as well. And one of the things that we learn early on is you want to be careful about tying the hands of future Congresses. And so we are trying to be respectful of the way business is done.

So we are excited about making this a priority in the commitment upfront and in the commitment, it shows to industry that this is real and that the Nation is going to build multiple icebreakers. They can get their arms around that and that makes them serious, that makes them competitive, and it spurs innovation, so we are going to get unique designs that are going to be able to meet our needs, and hopefully affordable.

If I could just take a second, sir, to clear up a misconception, however. I have heard a number of people, and I have been dealing with this for about 9 months now. There is a misconception, sir, that an icebreaker, it is really simple and it is not complex. And I would agree, in general, it is not rocket science. OK. We are not building a submarine, OK, by any means.

But I think people need to understand that we don't need an icebreaker. We need a Coast Guard cutter that can break ice so it can get to the places it has missions. It doesn't make sense to go up to the Arctic and just break ice. In fact, you know, some people might not like that, environmentalists, that sort of thing, OK?

We need the icebreaker because there is a mission to perform somewhere in the high latitudes. Maybe it is responding to a search and rescue case because of increased tourism. Maybe it is responding to an environmental spill of some sort because of oil exploration or mineral exploration on the seabed. You know, maybe it is a national defense mission of some sort, OK? Maybe it is mapping the seabed and preparing—making sovereignty claims and that sort of thing.

The point is, there is a mission that we need to accomplish and the ice is in the way, so we need to break the ice to get to where we need to conduct our missions. Just breaking ice for the sake of breaking ice may occur domestically, because we need to clear ports and keep them free for commerce. But in the high latitudes, it is generally because we have a mission we have to accomplish someplace and we need the icebreaker to do it.

And so that is why it is not just a simple icebreaker. It is a Coast Guard cutter that has the ability to break ice. So it won't be a complex cutter like a National Security Cutter, likely it will be something less. But the Coast Guard missions that we need to accomplish in terms of communications with other authorities, State, local, Tribal, et cetera, all those things need to be rolled into the icebreaker.

Mr. HUNTER. We are not saying we are not going to have comms on the icebreaker, or a skiff or something. That is not what we are saying, right? We are talking about the complexity that you choose to build for departments that are not the Coast Guard. Whether it is science stuff or militarization. As you know, the Coast Guard is a jack of all trades, master of some. But if you want to make the

icebreaker everything to everybody, it will be master of none, and it will be massively expensive.

If you added all those things with the possible missions that coincide with your 11 statutory missions and you try to put those all in an icebreaker, your costs are going to go up massively. I don't even know what those numbers would be, but I am sure you guys have taken a look, that if you got everything that you wanted on an icebreaker, what it would cost. It would be over $1 billion, right?

Admiral HAYCOCK. We concur, sir. That has been our effort over the last 9 months, is bringing that cost down.

Mr. HUNTER. So you are saying, here is all the stuff we wanted. Now we are going to cut it down to what we can afford?

Admiral HAYCOCK. We are trying to cut out the things that do not have major mission impact. That is really what we are going after.

Some of the cost savings that we have identified is also from the maturation of the actual cost model itself. So as all those things mature, we get more confident in the number and the number goes down.

Mr. HUNTER. And you told Mr. Garamendi you are going to have the design by the end of the year or the next 6 months or year, right? That was——

Admiral HAYCOCK. I think that also is a misunderstanding. So we will get the designs when the industry teams submit their proposals for the detailed design and construction. I don't know if that makes sense——

Mr. HUNTER. Because what I would like to get before that are your requirements. Because you said we got the—here is a $1.5 billion ship, we have to whittle that down. When will you have your requirements to give the subcommittee, what you have whittled it down to?

Admiral HAYCOCK. So we had an operational requirements document that was signed, I think, a year—or this past January, I believe. And so we are going to do a revision to that document.

Some of the changes that have been made to our internal indicative design, most of them are, you know, kind of buried in the engineering requirements, as opposed to the top-level operational requirements. So I think you are going to find that the icebreaker will meet virtually all the needs we need to meet. But the savings and stuff are some of the details.

Like Admiral West was talking about using commercial versus military specifications. We have gone through and that has been part of the calculus that has got us to our $200 million savings so far, is looking at those requirements and saying, which ones do we really have to have as a military specification and which ones can we go commercial?

Mr. HUNTER. But if you build block buy into your planning, you could add some of those requirements back, because of the money that you save. Or you could use the money to go onto the next ship, too. Are you, in your planning for your design, are you building the block buy? Are you assuming a block buy in your calculations? Because that either saves you money or not, right?

Admiral HAYCOCK. Yes, sir, that is part of the calculus. Through the foresight of this subcommittee, we had the Navy on our team in our Integrated Program Office. The Navy, as Mr. O'Rourke has indicated, has done this many times. And so we are listening to their counsel and taking things into consideration, some of the best practices they've put into place.

I think one of the things we haven't talked about is, you know, some of the acquisition processes that we've borrowed from the Navy that we are folding into our process. So we are learning from our engagement with the Navy. And block buy is certainly one of those.

Mr. HUNTER. That is all I have.

Mr. Garamendi, any closing thoughts?

Mr. GARAMENDI. I think I just heard you say closing thoughts, which gives me some indication that we are about to wrap up here.

Within the next 6 months, this committee and Congress are going to have to make some final decisions about the icebreakers. I think, Mr. Chairman, a closing thought is one that came up in the discussion a few, well, maybe 20 minutes ago. And that is, we should, since both of us are on the Seapower and Projection Forces Subcommittee, we should ask that subcommittee to ask the U.S. Navy, are there any military requirements for the U.S. Navy in the Arctic. It will be interesting to see what they have to say as to that. So I am going to carry that forward.

I want to thank the National Academies of Sciences for a very detailed study here that provides direction on most of the questions that we've asked. So over the next several months, probably the next 6 months, we are going to be moving toward the finalization of an icebreaker strategy for the United States. We are almost there. The question of three, three—three heavies and three lights, or four heavies, remains to be decided, and it is a critical question that we are going to have to answer here. The arguments made by the National Science Foundation are important and perhaps provide us with the final answer.

Ms. Mak, we are going to have to take a look at the question of block buy. I think the answer to that is going to lie in the nature of the contract itself and the design going into a block buy.

Also, I think, Mr. O'Rourke, you came up with this issue of the first one hits the waves and gets into the water will be tested and then the second, third or maybe fourth one will then be modified based upon the testing. Sea trials, is that the word?

Mr. O'ROURKE. Acceptance trials, yes, testing.

Mr. GARAMENDI. Or ice trials, or whatever.

Mr. O'ROURKE. There are lots of phases of that. They go by different names.

I just wanted to add one small point to what I said earlier. It was pointed out that under a block buy you might make a commitment to get components upfront for all the ships covered under the block buy, and that this could pose a risk if you decide to change the design or not get the follow ships. But that is only true if your block-buy contract is using EOQ purchases and buying those things upfront.

You can still do the block buy without that. It doesn't save as much as a block buy that does use EOQ purchases, but it still

saves. So if you are concerned about the risk of buying components and materials that may not work out for follow ships, you can get rid of that risk and still do the block-buy contract and still save money.

Mr. GARAMENDI. Well, once again, it depends on what those specific items are. Some are very, very well known and very low risk. Others are unique and would have a high risk. And so again, that goes to the contract itself and the sufficiency of the contract.

My final point is to Admiral Haycock. You have been unable to deliver to us a viable 5-year plan, noting what was given to us late last night, which really does not meet what we are already committed to build, for example, icebreakers.

I want to believe that the Coast Guard actually knows what it needs to do over the next 5 and 20 years, but that you have been prohibited from giving us that information by the Office of Management and Budget. That is a problem that I cannot accept, and it is one that I am going to, with hopefully—well, I am sure with the support of the chairman, try to see if there is some way for us to get information on what is a real 5-year and 20-year program for the Coast Guard on the acquisition, as well as for the operational.

Presumably, these new icebreakers will need personnel and fuel and we will have to build that into the operating budgets going forward.

So, Admiral Haycock, I for one will be pressing hard for a 20-year budget. It can be informal. It can be handed to us over the transom late at night. Or any other mechanism that might be used.

I will note that the U.S. Navy uses an informal mechanism to deliver information to us in a variety of ways, as does the Air Force.

I will let it go at that, Mr. Chairman. A very, very helpful and useful meeting. Thank you very much for structuring it. Thank you.

Mr. HUNTER. I thank the ranking member. This has been a fun 2½ hours.

I would like to thank the few Members that came and participated and you, the panel. Thank you very much. Appreciate it.

And with that, we are adjourned.

[Whereupon, at 12:27 p.m., the subcommittee was adjourned.]

MEMO

115th Congress

DATE:	July 25, 2017
TO:	DY
FROM:	Ross Dietrich
RE:	"Building a 21st Century Infrastructure for America: Coast Guard Sea, Land and Air Capabilities, Part II

- Mr. Chairman thank you for holding this hearing and thank you Admiral Zukunft and the other witnesses for being here today.

- Admiral Zukunft, the Fast Response Cutter Bailey Barco has recently been homeported in Ketchikan, Alaska, joining the state's first - and only- other Fast Response Cutter, John McCormick. I have heard from multiple communities and constituents in Alaska advocating for additional Fast Response Cutters to be home-ported in Alaska. In your testimony it states that production of six new Fast Response Cutters, hulls 39-44, has begun; while only 24 have been homeported to date, I would ask you seriously consider homeporting a few more Fast Response Cutters in Alaska.

- I want you to know that the current plan to replace cutters currently ported in Alaska, at a less than a 1-to-1 ratio, is a great concern to me and my constituents. Again, I understand that Fast Response Cutters are faster than their predecessor, but my concern is a reduction in coverage and decreased response times with fewer assets in such a vast area.

- Moving to the need to more heavy ice breakers, I have long been on record that the Coast Guard should review and analyze as many different financing ideas for as many icebreakers as possible. Alaska is the only Arctic state in the United States; let me reiterate that as previously frozen navigable waters open up – it is crucial to have the Coast Guard to provide adequate asset coverage and ice breaking capabilities for commerce, national defense, and economic prosperity.

- Admiral Zukunft, since we are discussing icebreaking and the Arctic, I want to make a point that the Department of Homeland Security Authorization, H.R. 2825, recently passed by the House, that addressed some Coast Guard issues in Alaska. One of those issues important to Alaska was in Section 5509. That section requires a report to Congress on oil spill and response capabilities for the Captain of the Port Zone that includes the Arctic. I understand that the Senate is considering a similar measure. I urge you not to take any administrative regulatory action on oil spill policy that affects Western Alaska, including the Arctic, until Congress concludes it's deliberations. It would be confusing and disruptive for you to take administrative regulatory action affecting Western Alaska and the Arctic and then have to change it to reflect congressional action.

Questions:

- Admiral Zukunft, please describe all the financing abilities currently available to the Coast Guard to procure icebreakers. What can we do through legislation to speed up the acquisition process even more? Has the private industry provided any interesting ideas?

- The shipyard, Lockheed Shipbuilding, which built the last U.S. icebreaker is no longer in operation, raising concern regarding the ability of U.S. shipyards to construct a quality icebreaker. Is there a capability to build the next generation of Coast Guard icebreakers in the US?

- What are Coast Guard cutters seeing in the Arctic that supports the operational need for these new assets? Does the Coast Guard plan to invest in any shore side infrastructure – or is there a need to us to invest in shore side infrastructure to assist in Coast Guard operations in Alaska and the Arctic?

- We've heard you speak about the need to grow the Coast Guard. What do you mean by that? Any plans for growth in Alaska?

STATEMENT OF
THE HONORABLE JOHN GARAMENDI
SUBCOMMITTEE ON COAST GUARD AND MARITIME TRANSPORTATION
HEARING ON
"BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA: COAST GUARD SEA, LAND AND AIR CAPABILITIES, PART II"
JUNE 7, 2017

Thank you, Mr. Chairman, and good morning. I look forward to renewing our oversight of the Coast Guard's major system acquisition programs.

I felt that our prior hearing on this topic in early June laid the groundwork for future substantive discussion, and it was my expectation that would happen today. Now, I am not so sure.

It is manifestly frustrating, again, to not have the Coast Guard provide to the committee the capital planning and budget information that the Coast Guard is required, by statute, to provide to this committee.

And make no mistake about it: this committee is deprived of critical information when both the Five-Year and Twenty-Year Capital Investment Plans are not forthcoming.

The absence of these documents makes it difficult, if not impossible, to understand and appreciate the budget trade-offs among acquisition programs.

Moreover, this gap in information compromises our ability to flag programs that have gone off-budget, or to ensure that the taxpayers' dollars are invested as wisely as possible to maintain Coast Guard mission readiness and capability.

As I mentioned in my remarks at the June 3 hearing, the Coast Guard has an enduring role in protecting our shores and in facilitating our maritime commerce. When we talk about ensuring the future prosperity and security of the Nation, few things are as important as providing the Coast Guard with the equipment it needs.

When this subcommittee is not provided essential information to fully understand the complexities of these expensive and important procurements, however, it makes it that much more difficult for the members of this subcommittee to advocate and build greater support in the Congress for the Coast Guard's budget.

And so, I am somewhat resigned to have to lower my expectations for what we might learn this morning – and that is a

missed opportunity as many decisions will likely be made soon about the Federal budget for Fiscal Year 2018.

Nevertheless, here we are, and I intend to get as much out of this hearing as possible.

To the extent that Admiral Zukunft or Rear Admiral Haycock can fill in the blanks, I would appreciate hearing each of their insights. And as to our other witnesses, welcome, and I look forward to your testimony on this important subject. Thank you.

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TESTIMONY OF
ADMIRAL PAUL F. ZUKUNFT
COMMANDANT

ON
BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA:
COAST GUARD SEA, LAND, AND AIR CAPABILITIES – PART II

BEFORE THE
HOUSE TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEE ON COAST GUARD AND MARITIME TRANSPORTATION

JULY 25, 2017

Good morning, Chairman Hunter, Ranking Member Garamendi, and distinguished members of the subcommittee. I appreciate the opportunity to testify today and thank you for your enduring support of the United States Coast Guard.

As the world's premier, multi-mission, maritime service, the Coast Guard offers a unique and enduring value to the Nation. The only branch of the U.S. Armed Forces within the Department of Homeland Security (DHS), a federal law enforcement agency, a regulatory body, a first responder, and a member of the U.S. Intelligence Community – the Coast Guard is uniquely positioned to help secure the maritime border, combat transnational criminal organizations (TCO), and safeguard commerce on America's waterways.

Coast Guard authorities bridge gaps and create opportunities. The Coast Guard is first and foremost an armed service that advances national security objectives in ways no other armed service can. Our combination of broad authorities and complementary capabilities squarely align with the President's national security and economic prosperity priorities. Appropriately positioned in DHS, the Coast Guard is also an important part of the modern Joint Force.[1] The Coast Guard offers trusted access to advance mutual interests, preserve U.S. security and prosperity, and serve as a force multiplier for the Department of Defense (DoD). I am proud of our enduring defense contributions to Combatant Commanders around the globe and of the return on investment your Coast Guard delivers on an annual basis.

I also appreciate the unwavering support of this Subcommittee to address our most pressing needs. I will continue working with the Administration and this Congress to preserve momentum for our existing acquisition programs and employ risk-based decisions to balance readiness, modernization, and force structure with the evolving demands of the 21st century.

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[1] In addition to the Coast Guard's status as an Armed Force (10 U.S.C. § 101), see also Memorandum of Agreement Between the Department of Defense and the Department of Homeland Security on the Use of Coast Guard Capabilities and Resources in Support of the National Military Strategy, 02 May 2008, as amended 18 May 2010.

Secretary Kelly leads the Department's efforts to secure our borders, and the Administration's strategy "to deploy all lawful means to secure the Nation's southern border"[2] relies on the Coast Guard supporting this comprehensive security strategy. The Coast Guard protects the U.S. maritime border – not just by operating in U.S. territorial waters, but also by conducting operations off the coasts of South and Central America. As Secretary Kelly has stated, "the defense of the southwest border really starts about 1,500 miles south."[3]

It begins with broad Coast Guard authorities, over 40 bilateral agreements to enable partner-nation interdictions and prosecutions and engage threats as far from U.S. shores as possible. The Coast Guard is best positioned to disrupt the large volumes of illicit drugs transiting by sea. We employ a robust interdiction package consisting of assets, specialized personnel and broad authorities to seize multi-ton loads of drugs at sea before they can be broken down into small quantities ashore.

In 2016, Coast Guard and partner agencies interdicted more cocaine at sea than was seized at the land border and across the entire Nation by all federal, state and local law enforcement agencies combined. A service-record 201.3 metric tons of cocaine[4] (7.1% of estimated flow)[5] was removed from the western transit zone and 585 smugglers were detained for further prosecution.

Coast Guard readiness relies on the ability to simultaneously execute our full suite of missions and sustain support to Combatant Commanders, while also being ready to respond to contingencies. Your Coast Guard prides itself on being *Semper Paratus* – Always Ready – and predictable and sufficient funding is necessary to maintain this readiness in the future. Prudence demands that we continue investing in a modernized Coast Guard. Indeed, recapitalization remains our highest priority, and today's efforts will shape your Coast Guard and impact national security for decades. Your support has helped us make tremendous progress, and it is critical we build upon our successes to field assets that meet cost, performance, and schedule milestones. I am encouraged by our progress to date.

In 2016, we awarded a contract to complete build out of our fleet of 58 Fast Response Cutters (FRC) at an affordable price, and just last month we exercised an option to begin production of six FRCs (hulls 39-44). In September, we awarded a contract for Detail Design and Construction of the Offshore Patrol Cutter (OPC).

These cutters will eventually comprise 70 percent of Coast Guard surface presence in the offshore zone. OPCs will provide the tools to enforce federal laws more effectively, secure our maritime borders by interdicting threats before they arrive on our shores, disrupt TCOs, and respond to 21st century threats. We will order long-lead-time material for the first OPC later this year, and plan for its delivery in 2021.

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[2] Executive Order No. 13767 on Border Security and Immigration Enforcement Improvements, 25 January 2017.
[3] Secretary Kelly Hearing Testimony, "Ending the Crisis: America's Borders and the Path to Security" before the House Homeland Security Full Committee and Subcommittee on Border and Maritime Security Joint Hearing on America's Borders, Panel 1, 07 February 2017.
[4] US Department of Homeland Security, Office of Inspector General, *Review of U.S. Coast Guard's Fiscal Year 2016 Drug Control Performance Summary,* OIG Report, OIG-17-33, February 1, 2017.
[5] [US Department of Homeland Security, Office of Inspector General, *Review of U.S. Coast Guard's Fiscal Year 2016 Drug Control Performance Summary,* OIG Report, OIG-17-33, February 1, 2017.]

We are making progress toward building new polar icebreakers. Last July, we partnered with the Navy to establish an Integrated Program Office to acquire new heavy icebreakers. This approach leverages the expertise of both organizations and is delivering results. The recent award of multiple Industry Studies contracts – a concept the Navy has utilized in previous shipbuilding acquisitions to drive affordability and reduce schedule and technical risk – is an example of the positive results of this partnership. We will refine the system specification and release a request for proposal for Detail Design and Construction in FY 2018.

In 2018, we will also evaluate materiel and non-materiel options to replace the capabilities provided by the current fleet of inland tenders and barges commissioned between 1944 and 1990. Given the age and functionality of this fleet, requested funding supports initial Program Management Office exploratory activities to replace this vital capability, including the potential for commercial services and alternative crewing options, as well as recapitalization alternatives.

We are also making progress with unmanned aerial systems. A recent small Unmanned Aerial System (sUAS) proof of concept aboard an NSC conducted actual interdiction operations, which enhanced the overall effectiveness of the cutter. In its inaugural deployment, Coast Guard Cutter STRATTON's sUAS logged 280 flight hours, providing real-time surveillance and detection imagery for the cutter, and assisted the embarked helicopter and law enforcement teams with the interdiction or disruption of four go-fast vessels carrying more than 5,000 pounds of contraband. In addition, we are exploring options to build a land-based UAS program that will improve domain awareness and increase cued intelligence that our surface assets rely on to close illicit pathways in the maritime transit zone. While long-term requirements are being finalized, we are moving quickly to field this much-needed capability.

In concert with efforts to acquire new assets, we are also focused on improving the existing fleet of cutters and aircraft through sustainment programs. The current work being conducted at the Coast Guard Yard in Curtis Bay, Maryland, includes a Service Life Extension Project (SLEP) to enhance mission readiness and extend the service life of the 140-foot icebreaking tug class by approximately 15 years. Also, last year, the Coast Guard initiated a Midlife Maintenance Availability on 225-foot sea-going buoy tenders that will address obsolescence of critical ship components and engineering systems. The work on these two platforms is vital to sustaining current mission performance and essential to maritime commerce. Additionally, the Aviation Logistics Center in Elizabeth City, North Carolina, conducts centralized, world-class depot maintenance activities to enhance mission performance of our rotary and fixed-wing aviation assets.

In addition to the focus on recapitalizing our surface and aviation fleets, we are also mindful of the condition of our shore infrastructure. Investments in shore infrastructure are also critical to modernizing the Coast Guard and equipping our workforce with the facilities they require to meet mission.

While readiness and modernization investments improve current mission performance, the right force is central to success. I am incredibly proud of our 88,000 active duty, reserve, civil service, and auxiliary members. I am working aggressively to validate a transparent and repeatable model to identify the appropriate force structure required for the Coast Guard to respond simultaneously to global, national, and regional events.

Funding 21st century Coast Guard platforms and people is a smart investment, even in this challenging fiscal environment. Modern assets bring exceptional capability, but our greatest strength will always be our people. Coast Guard operations require a capable, proficient, and resilient workforce that draws upon the broad range of skills, talents, and experiences found in the American population. Together, modern platforms and a strong, resilient workforce will maximize the Coast Guard's capacity to meet future challenges.

History has proven that a responsive, capable, and agile Coast Guard is an indispensable instrument of national security. With the continued support of the Administration and Congress, the Coast Guard will continue to live up to our motto. We will be *Semper Paratus* – Always Ready. Thank you for the opportunity to testify before you today and for all you do for the men and women of the Coast Guard. I look forward to your questions.

ACQUISITION AND OPERATION OF POLAR ICEBREAKERS: FULFILLING THE NATION'S NEEDS

Statement of
Rear Admiral Richard D. West (U.S. Navy, Retired)

Chair
Committee on Polar Icebreaker Cost Assessment
Division on Earth and Life Studies
and
Transportation Research Board of the
The National Academies of Sciences, Engineering, and Medicine

before the

Subcommittee on Coast Guard and Maritime Transportation
Committee on Transportation and Infrastructure
U.S. House of Representatives

Hearing on

Building a 21st Century Infrastructure for America: Coast Guard Sea, Land, and Air Capabilities, Part II

July 25, 2017

Chairman Hunter, Ranking Member Garamendi, and distinguished members of the subcommittee, thank you for the opportunity to discuss the recently released report '*Acquisition and Operation of Polar Icebreakers: Fulfilling the Nation's Needs*,' which I would also like to enter into the record.

My name is Dick West. I am a retired U.S. Navy Rear Admiral, and I chaired the study committee that authored the report for The National Academies. Our report was requested by this subcommittee, and focuses on strategies to minimize capital acquisition and operating costs for polar icebreakers capable of meeting the Coast Guard's mission requirements, including breaking out McMurdo station.

For more than 30 years, studies have shown the need for polar icebreakers to fulfill the Coast Guard's statutory missions and to meet other national goals. These studies have indicated ever-widening gaps in the nation's ability to meet its statutory obligations, protect its interests, and maintain leadership in the high latitude regions of the Earth.

We recommend building four heavy polar icebreakers—owned and operated by the Coast Guard— and propose an acquisition strategy that could address these anticipated gaps. We examined leasing options and found them to be more expensive for the federal government over the life of the assets. The first three heavy icebreakers would meet the Coast Guard's need to provide a continuous presence in the Arctic, while the fourth heavy icebreaker could perform the annual McMurdo breakout, with one of the first three icebreakers assigned to the Arctic providing emergency backup, if needed.

The recommended acquisition strategy employs block buy contracting with a fixed price incentive fee for the four ships and a design for a single class of heavy polar icebreakers. By using a single design, we estimate that the fourth heavy icebreaker would cost less than a first medium icebreaker. With our recommended strategy, icebreaker design and construction costs can be clearly defined. A fixed price incentive fee construction contract is the most reliable mechanism for controlling costs for this program. Block buy authority for this program will need to contain specific authorizing language for economic order quantity purchases for materials, advanced design, and construction activities.

Such a contracting program with economic order quantity purchases enables series construction, motivates competitive shipyard bidding, enables shipyard infrastructure investment, and reduces material acquisition costs—allowing for volume purchase and for the timely acquisition of material with long lead times. It would enable continuous production, give the program the maximum benefit from the learning curve, and thus reduce labor hours and costs on subsequent vessels.

Technology transfer from icebreaker designers and builders with recent experience is critical for reducing design and construction costs. In addition, the design should maximize the use of commercial off-the-shelf (COTS) equipment, apply the Polar Code and commercial standards, and reduce military specifications (MIL-SPEC) to the minimum amount necessary. Reduction of MIL-SPEC requirements could significantly lower the acquisition cost of each ship with no loss of mission capability. Importantly, the program schedule must allow for completion of design

and planning before the start of construction. Our recommended acquisition, design, and construction strategies will control possible cost overruns and provide significant savings in overall life-cycle costs for the polar icebreaking program.

We recommend that the single design for the heavy icebreakers is made "science ready" and include sufficient space and margins to accommodate the needs for future scientific installation. The additional design cost is minimal, especially compared to a subsequent retrofit. Recognizing that the *Healy* is halfway through its expected service life, the fourth proposed vessel could be made "science capable," or fully outfitted for science.

The *Polar Star* is well beyond her expected service life. We propose an enhanced maintenance program with the intent of keeping the vessel operational through the delivery of at least the first new icebreaker. Although extending the life of the *Polar Star* will be challenging, the committee recommends against compressing the design and construction schedule of the new icebreakers, as such an approach may lead to cost overruns.

Mr. Chairman, this concludes my statement. Thank you again for the opportunity to testify, and I will be pleased to respond to any questions the subcommittee may have.

Building a 21st Century Infrastructure for America: Coast Guard Sea, Land, and Air Capabilities, Part II

Questions for the Record
Submitted on behalf of Ranking Member John Garamendi (D-CA)

Response by
Rear Admiral Richard D. West (U.S. Navy, Retired)

Chair
Committee on Polar Icebreaker Cost Assessment
Division on Earth and Life Studies
and
Transportation Research Board of the
The National Academies of Sciences, Engineering, and Medicine

1. **How confident are you about the cost estimates in your report? Do you really expect that the Coast Guard will adopt the recommendation to minimize military specifications?**

Cost Estimates
Please see page 101 of our letter report, which discusses the committee's rough order of magnitude (ROM):

> Committee members independently developed cost estimating models as a means of assessing the likely cost of both the heavy and the medium icebreakers. Results were compared, analyzed, adjusted, and then summarized. The committee reached a consensus on the results before including them in this report. Comparison was then made with the overall cost estimate publicly available from USCG. The committee's cost estimating methods and results are believed to be consistent with those of the Naval Sea Systems Command (NAVSEA) and USCG. The committee's ROM estimates for design and construction of a series of up to four heavy icebreakers are summarized in Table D-6.

TABLE D-6 Committee Independent Cost Estimate: U.S. Design and Construction of a Heavy Polar Icebreaker

Cost Category	Ship 1	Ship 2	Ship 3	Ship 4
Engineering, detail design, and planning	128	19	6	3
Materials and equipment	318	310	319	327
Production labor and overhead	255	221	208	169
Profit, risk margin, and facilities capital cost of money	120	93	82	78

Total, shipyard contract	821	643	614	577
GFM and GFE	22	22	22	22
Change orders	78	30	29	29
Other government expenses	62	63	65	65
Total, government program expenses	162	115	116	116
Grand total per vessel	983	759	729	692

Overall program costs	
Total program budget, four ships	3,163
Average price, each of two	871
Average price, each of three	824
Average price, each of four	791

NOTE: Costs are in millions of U.S. dollars, 2019.
SOURCE: Generated by the committee.

Also, please see the committee's report beginning on page 123, the section titled:
Range of Uncertainty:

> The committee has provided ROM cost estimates. They were produced in a manner consistent with widely accepted shipyard practices and similar to the government's internal procedures. However, the degree to which the estimates will correspond to the eventual costs of the ships that are built can be difficult to establish. During preparation of bids for shipbuilding contracts, uncertainty is sometimes assessed through Monte Carlo simulations. Hundreds of runs with sophisticated software unavailable to the committee are made to determine likely outcomes. To identify possible sources of cost variability, the committee analyzed key assumptions in the following areas:
>
> - Basic work scope;
> - Engineering, detail design, and planning;
> - Material and equipment cost;
> - Production labor and productivity;
> - Risk margin applied by the shipyard;
> - Learning rate assumed by the shipyard; and
> - Profit margin assumed by the shipyard.

The committee discusses possible sources of cost variability in great detail on pages 123 – 131. Overall, the committee notes:

> *Total Shipyard Contract Cost Variance*
>
> The variances of the different assumptions listed above are presented individually. Occurrence of all the extremes is unlikely. On the basis of its experience and judgment, the committee considers the range of uncertainty for the baseline cost estimates as ±15 percent for the medium icebreakers and ±10 percent for the heavy icebreakers. These uncertainties are intended to represent a range of plus-or-minus one standard deviation, similar to the practices of major U.S. shipbuilding corporations. Table D-16 shows how these variances may accrue to the committee's estimates for total program cost.

TABLE D-16 Total Program Cost with Uncertainties

	Heavy Icebreakers				Medium Icebreakers			
	Baseline	**Var.**	**Low**	**High**	**Baseline**	**Var.**	**Low**	**High**
Ship 1	983	82	901	1,065	786	96	690	882
Ship 2	759	64	695	823	582	71	511	653
Ship 3	729	61	668	790	554	67	487	621
Ship 4	692	61	631	753	549	66	483	615

NOTE: The assumed range of uncertainty is ±10 percent of the total shipyard contract for heavy icebreakers and ±15 percent of the total shipyard contract for medium icebreakers. Figures are in millions of U.S. dollars.

Even with these uncertainties, the committee believes that its recommendation to design and build four heavy icebreakers of one design versus three heavy icebreakers and one medium icebreaker or three heavy and three medium icebreakers is still valid.

Military Specifications (MIL-SPEC)

Please see page 113: *Definition of MIL-SPEC*

The committee notes that MIL-SPEC is a broader term than "militarization." However, the committee is unable to predict what MIL-SPEC requirements the USCG will adopt.

MIL-SPEC is similar to MIL-STD (short for defense or military standards). Both establish uniform engineering and technical requirements for processes, procedures, practices, and methods unique to the military. Five types of MIL-STD exist. They cover interfaces, design, manufacturing, standard practices, and testing. US Navy applies many MIL-SPEC and MIL-STD to the design, manufacture, and testing of equipment installed in USN ships. They are based on the need for specialized features and capabilities that enable the vessels to operate effectively in the often harsh environment faced by combatant vessels. While the USCG believes that its cutters may face some of the same risks as military vessels, the committee believes that the polar icebreakers will not require the same specialized features as most military vessels.

To reduce the overall acquisition costs of the new icebreakers, the committee recommends that the new polar icebreakers incorporate a design that maximizes use of commercial off-the-shelf (COTS) equipment, applies Polar Codes and updated commercial standards, and only applies military specifications (MIL-SPEC) to the (minimum) armament, aviation, communications, and navigation equipment.

Since much of the intended service of polar icebreakers is largely outside military functions, the committee believes, in general, that the new icebreakers can be built to commercial standards without reference to military specifications (MIL-SPEC), except when such equipment may be warranted (see above). International Maritime Organization (IMO) and class standards for vessels intended for polar service are high, and ships built to these standards will be well suited for the primary mission requirements of icebreaking and supporting missions in polar waters.

The use of COTS technology and the minimization of MIL-SPEC, as recommended, will also reduce long-term maintenance costs, since use of customized equipment to meet MIL-SPEC requirements can reduce reliability and increase costs.

2. Your report calls for four polar icebreakers as opposed to the six icebreakers (three heavy, three medium) as identified in the High Latitude Region Mission Analysis. Why?

The committee was asked to suggest strategies for minimizing life-cycle costs of polar icebreaker acquisition and operations. The committee recommends a single class of polar icebreaker with heavy icebreaking capability. Proceeding with a single class means that only one design will be needed, which will provide cost savings. The committee has found that the fourth heavy icebreaker could be built for a lower cost than the lead ship of a medium icebreaker class (see Table D-10, page 111).

The committee's analysis indicated that four heavy icebreakers will meet the statutory mission needs gap identified by DHS for the lowest cost. The USCG still has the services of the Healy, which would provide the USCG a fifth icebreaker until at least 2035. While the Mission Need Statement indicates that "**a fleet of up to six**" polar icebreakers (three heavy and three medium) **may be required**, the committee suggests that four heavy icebreakers will meet the current capacity and capability gaps identified in the Mission Need Statement. The first three heavy icebreakers would meet USCG's need for its statutory missions and a continuous presence in the Arctic, and the fourth heavy icebreaker could perform the annual McMurdo breakout. The DHS Mission Need Statement, based on modeling from the High Latitude Analysis Report, maintains that the USCG will only "**potentially**" require **"a fleet of up to six icebreakers**," not that it requires exactly six.

If the single vessel dedicated to the Antarctic is rendered inoperable, USCG could redirect an icebreaker from the Arctic, or it could rely on support from other nations. The committee considers both options to be viable and believes it difficult to justify a standby (fifth or sixth) vessel for the Antarctic mission when the total acquisition and lifetime operating costs of a single icebreaker are projected to exceed $1.6 billion. Once the four new icebreakers are operational, USCG can reasonably be expected to plan for more distant time horizons. USCG could assess the performance of the early ships once they are operational and determine whether additional capacity is needed.

3. If the Coast Guard does agree to minimize Military Specifications on new icebreakers, what would be the trade-offs in capability and mission readiness for these new icebreakers?

Members of the Committee do not anticipate significant trade-offs in capability and mission readiness if commercial standards are adopted for these new icebreakers, instead of Mil-Spec. This assessment is based on long personal experience with both commercial and naval shipbuilding. Further, members of the shipbuilding industry who briefed the NAS Committee in Seattle provided a similar assessment. Rather, procurement of equipment and design to Mil-Specs will likely restrict access to the best new equipment and add expense of testing to certification to Mil-Specs. We note in the committee's report on page 88 that foreign icebreakers (M/V Oden and M/V M/V Vladimir Ignatyuk) successfully performed the breakout of McMurdo Station during the most recent overhaul of the USCGC Polar Star. The lack of Mil-Spec

compliance on these foreign ships did not compromise their capability or mission readiness during these operations.

4. The NAS assessment recommends the Coast Guard acquire new icebreakers as opposed to leasing icebreakers because it is less costly to the federal government. Could you please detail the factors that contributed to this recommendation?

For a detailed explanation of factors that contributed to the committee's recommendation, please see Appendix C of the report, pages 45-61. The committee's cash flow analysis worksheet is available here: http://onlinepubs.trb.org/onlinepubs/sp/IcebreakerLeaseBuycalculation2.xlsx.

The net present value of the cost to the government of leasing a $791 million asset (the committee's estimated average price, each of four icebreakers) with a 30-year life (through use of a capital lease that is based on the committee's assumptions and analysis, including tax payments by the lessor to the U.S. Treasury, and OMB's 2.8 percent discount rate) would be $939 million. The $939 million is $148 million, or 19 percent, more than the $791 million direct purchase cost.

On the basis of the committee's calculations, an increase in the weighted average cost of capital (WACC) applied to the analysis (after tax) to 6 percent would raise the cost of leasing to 35 percent more than the cost of buying. Historically, the WACC (after tax) for leasing firms has been on the order of 10 to 15 percent higher than the current WACC for maritime assets. The committee would expect the cost of leasing to increase with higher WACC assumptions and thus make the leasing option even less attractive for the federal government. At a 35 percent corporate tax rate, the leasing cost is 19 percent higher than the cost of direct purchase. A reduction in the corporate tax rate from 35 percent to 0 percent would result in the cost of the lease being approximately 24 percent higher than the cost of direct purchase.

The following are among the reasons for the higher cost of leasing as opposed to buying:

- The U.S. government is considered the lowest-risk borrower (U.S. government securities are considered "risk free"). Therefore, it can borrow funds at a lower cost than any other organization. The 30-year high quality market corporate bond spot rate in March 2017 was 4.68 percent (Federal Reserve Bank of Saint Louis 2017).
- Leasing companies require a return on equity (the current equity risk premium over the risk-free rate is on the order of 7.8 percent) that would meet the profit expectations of the lessor on the transaction.

Leasing costs the government more than buying because the rate that leasing firms pay to borrow funds exceeds the rate at which the government can borrow (GAO 2016). In addition, leasing firms use equity (which costs more than debt) and require a return (profit) on the equity used (GAO 2016). This analysis does not consider the "transaction" costs inherent in a leveraged lease transaction (leveraged lease transaction costs involve legal and financial adviser fees that significantly increase the cost to the government).

The conclusion that purchasing a USCG cutter for icebreaking is less costly to the government than leasing would also apply to a non-USCG option. Such an option would be to lease a U.S.-owned heavy icebreaker solely for breaking out McMurdo and supporting other

scientific missions in the Antarctic. For the federal government, regardless of an asset's use, buying is less expensive than leasing for a long-term asset life of 30 years for the two reasons described above.

Under the *Palmer–Gould* model of a shorter-term service contract, the lease would be an operating lease as long as it met the OMB-defined requirements (OMB 2016a). The lease would be for a maximum of 5 years unless a longer term was written into the appropriation (OMB 2016a). A polar icebreaker is more of a specialty vessel than the *Palmer* or the *Gould*. Thus, there may not be as high a demand for its use, and attracting a private company with a 5-year (perhaps longer) lease term for an expensive vessel may be more difficult.

Federal Reserve Bank of Saint Louis. 2017. 30-Year High Quality Market (HQM) Corporate Bond Spot Rate (HQMCB30YR). https://fred.stlouisfed.org/series/HQMCB30YR. Accessed April 21, 2017.

GAO. 2016. Coast Guard: Arctic Strategy Is Underway, but Agency Could Better Assess How Its Actions Mitigate Known Arctic Capability Gaps. GAO-16-453. Washington, D.C.

OMB. 2016a. Circular A-11 Capital Programming Guide, Version 3.0. Washington, D.C.

5. The NAS recommends pushing back the delivery date of the first icebreaker to ensure stable requirements for detail design. Are there factors or flaws you identified in the operation of the joint Coast Guard/Navy Integrated Heavy Icebreaker Program that should be, or could be, addressed to maintain the accelerated timetable?

The committee's report provides an extensive schedule analysis with supporting rationale on pages 74 – 86. This discussion reflects the experience of committee members and US shipyard executives, who briefed the committee. As shown in Figure D-1, this results in Delivery of the first ship in Month 50 (after Contract Award) and predicted commissioning of the first ship 4 months later at Month 54.

In contrast to Asian shipyards best practices, European shipyards have applied concurrent engineering methods in the past to achieve shorter overall program schedules. Concurrent engineering allows start of construction on the ship when the detail design is partially complete, while the best current Asian practices do not release the detail design and production planning for construction until the detail design, bills of material, and planning information are complete for the entire ship; our Committee has applied the Asian best practice to our schedule analysis. While it may be possible to apply concurrent engineering practices to the first-of-class U.S. polar icebreaker, the committee does not believe this would accelerate the overall program schedule by more than 3 or 4 months (see pages 74-80).

Another feature of the NAS Committee's schedule analysis is to test the ability of the shipyard to build to the developing detail design in the specific shipyard through construction of several pilot blocks. This has proven to be a prudent and diligent approach to reduce risk of cost overruns and construction delays. A further schedule acceleration of another 2 months may be possible if the USCG and the shipyard

foregoes the pilot block construction and demonstration. However, this approach increases risk for the entire program as the opportunity to learn of necessary corrections to design, procurement and planning information is eliminated.

Each individual shipyard competing for this contract will apply their standard durations and margins in developing schedules that suit their specific practices and facilities. If the USCG desires a shorter schedule, they must clearly state these expectations and incentivize performance to attain accelerated schedules. Either way, this will increase costs, either through risk of delay and disruption, or through acceleration.

6. The NAS assessment reports that operational costs for these new icebreakers will be considerably less. Can you please explain why?

Operational costs consist of several cost components that are incurred on an ongoing basis as a ship remains in service. These are usually annualized to prepare an annual operating budget for a ship. Several of the largest cost components are listed below. The USCG has its own methods of breaking down costs and preparing budgets, but it is expected they would follow somewhat similar categories[1]. Cost components not mentioned are usually less than the ones listed.

1. Manpower Related Costs
2. Unit Operations including Fuel
3. System Maintenance
4. System Improvements

As stated in the NAS Report, Appendix D, Section on Operating and Maintenance Costs (page 119) "the committee expects the operating costs for the new heavy polar icebreakers to be less than those of the *Polar Star*". The report discusses the reasons for this conclusion, which can be broken down according to the above key cost components.

Manpower Related Costs

Regarding manpower, the NAS report states on page 119, "the committee notes that the projected crew size for the polar icebreaker replacement could be similar to that of other USCG cutters, 120 to 126 berths. Whether this number includes the crewing for any mission or scientific support detachments is unclear. USCG was unable to provide estimates for the operating costs of the polar icebreaker replacement because the design and the crewing requirements have not been finalized." However, the committee does believe crew size will likely be similar to the existing heavy icebreaker *Polar Star* and because of availability of automation technology the possibility exists to reduce crew size or free them for other duties onboard (page 120). Since manpower costs are normally related to crew size, having similar sized or smaller crew on the new icebreakers should keep manpower costs similar or reduced from current projections for the existing icebreakers. It should be noted that manpower costs rise over time, however, these cost increases are not related to the age of the vessel, but to other factors and would be incurred even if the existing icebreakers continued in service.

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[1] USCGC POLAR STAR, Business Case Analysis, 2013 Report to Congress, Nov. 7, 2013, US Coast Guard, Section VI, Life Cycle Cost Estimate

Unit Operations Including Fuel Cost
Unit Operating Costs are heavily dependent on the operating profile of the vessel, including its destinations, voyage length, days at sea, transit speed, and others. The largest operations cost component when a ship is at sea is normally fuel cost. As stated on page119 of the report "in general, the engines and hull designs of new ships are more efficient than those of the vessels that they replace, so fuel consumption—usually one of the largest cost components of annual operating cost—is generally lower for new ships." The substantial increase in fuel efficiency of new diesel engines compared to the 40 year old diesel engines in the *Polar Star*, plus the use of diesel engines for icebreaking rather than gas turbines as used on the *Polar Star*, both contribute to this expected greater fuel efficiency of a new icebreaker.
Other aspects of Unit Operations costs should likely be similar for the new icebreakers and the *Polar Star* and will be influenced by the mission, number of days at sea and operating profile during the mission. If the new icebreakers spend more days at sea than the current icebreakers, this could lead to an overall high operating budget for the vessel, even though there is less operating cost on a daily basis.

System Maintenance
The committee directly addresses this issue on page 119 of the report as follows, "furthermore, newer ships, particularly in the first 10 years of life, will have fewer repairs and little wastage or deterioration. Major overhaul and repair costs, including dry dock costs, will be significantly lower than those of an old vessel requiring expensive repairs and more frequent maintenance because of hull corrosion and deteriorating machinery. The improved sensors and data tracking provided by modern technology permit greater use of planned and condition-based maintenance. The result is less frequent maintenance, which reduces annual cost. Modern machinery also is more reliable and allows greater time between overhauls. For these reasons, the committee believes that operating costs for the new icebreakers could be less than those of the *Polar Star* and the *Healy*."

System Improvements
A new ship should have little need for improvements or equipment replacement in the first 10 years of operation as mentioned in the report (page 119), so there should be little need for System Improvements in the early years of life. This is one of the benefits of operating new ships.

Conclusion
As described above, for three of the four major cost components of operating icebreakers, it is expected the new icebreakers, on a per vessel per day basis, will be lower in cost than the *Polar Star*, the vessel they replace. In some aspects, they may even be lower in cost than the *Healy*, which does have a smaller crew and similar propulsion plant, but is getting on in age so its System Maintenance and System Improvement costs will likely be higher than for a new icebreaker. For Manpower costs, based on the assumed similar crew sizes for the new icebreakers and the existing icebreakers, there should not be much difference in operating cost, which will rise over time, independent of whether new icebreakers are constructed. The other point to consider is the impact of the operating profile of the new icebreakers, such as days at sea and transit distances. If these are significantly longer for new icebreakers compared to the existing icebreakers, then operating budgets can go up, even though the cost per day is less. The

other point to consider is the committee does recommend four new icebreakers in place of the current two, so overall icebreaker operating budgets will go up based on the increased number of vessels in service.

7. **The NAS assessment recommends weakening or waiving Buy America requirements to bring down costs. Can you please explain how you reached that finding? If Buy America requirements did apply, what would be the incremental cost increase per vessel?**

The NAS Committee has substantial experience procuring equipment sourced from abroad in Asia and Europe, as well as from domestic sources in the United States. High quality foreign equipment and material can often be procured at a reduction in delivered cost. Examples include motor operated valves from Europe or Asia and electrical cable procured to International Electrical Code (IEC) regulations from Korea.

Icebreaker steel for the hull is likely to be a special run at U.S. mills, with high-tensile properties, high notch toughness and high quality control requirements to ensure no delamination of thick plate. Mills in Europe and in Asia may be able to offer a lower delivered price for this steel, with tests and certifications that demonstrate that the required properties of the steel are attained.

In some cases, the U.S. industrial base may not be able to offer equipment that meets the design specifications for a polar icebreaker. For example, U.S. Original Equipment Manufacturers (OEMs) may not be able to provide standard off-the-shelf diesel generators of sufficient capacity and capability for main propulsion of icebreakers. Similarly, it may not be possible to procure azimuthing thrusters from any U.S. domestic source. Electrical power conditioning equipment (transformers, medium voltage switchgear, and machinery control systems) may require custom design and manufacture if procured domestically. A Buy-American requirement for this equipment may force a sub-optimal tradeoff to more and smaller units available in the US market, which increases shipyard labor and first cost and lifecycle cost for USCG.

A good compromise approach is to apply Buy American requirements similar to Military Sealift Command (MSC) contracts for auxiliary ships. Please refer this question to MSC for a more concise definition of the scope and MSC experience with Buy American requirements.

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TESTIMONY OF
REAR ADMIRAL MICHAEL J. HAYCOCK
ASSISTANT COMMANDANT FOR ACQUISITION AND CHIEF ACQUISITION OFFICER

ON
BUILDING A 21ST CENTURY INFRASTRUCTURE FOR AMERICA:
COAST GUARD SEA, LAND, AND AIR CAPABILITIES – PART II

BEFORE THE
HOUSE TRANSPORTATION AND INFRASTRUCTURE
SUBCOMMITTEE ON COAST GUARD AND MARITIME TRANSPORTATION

JULY 25, 2017

Good morning Mr. Chairman and distinguished members of the Subcommittee. I appreciate the opportunity to testify today, and thank you for your enduring support of the United States Coast Guard.

As the service's Chief Acquisition Officer, I especially appreciate the unwavering support of this Subcommittee to address our most pressing recapitalization needs. The Coast Guard is working closely with the Department of Homeland Security (DHS) and Congress to efficiently and effectively execute our existing acquisition programs and is employing risk-informed decisions to balance readiness, modernization, and force structure with the evolving demands of the 21st century.

Coast Guard personnel and assets must be ready to simultaneously execute our full suite of missions, sustain requested support to Combatant Commanders, and respond to contingencies when they arise. Your Coast Guard prides itself on being *Semper Paratus* – Always Ready. Prudence demands that we continue investing in a modernized Coast Guard. Indeed, recapitalization remains our highest priority, and today's efforts will shape the Coast Guard and impact national security for decades. Your support has helped us make tremendous progress, and it is critical we build upon our successes to field assets that meet cost, performance, and schedule milestones. I am excited and encouraged by our progress to date.

The Coast Guard is in the midst of recapitalizing the service's surface, aviation and command and control capabilities through more than 20 major and non-major acquisition programs. These efforts are supported by a framework of governance and policies developed by DHS and the Coast Guard; are in line with best practices identified by our federal partners, including the Department of Defense and the U.S. Navy; and are constantly evolving based upon lessons learned.

Over the past year, we have made great progress in delivering enhanced capabilities to operational commanders in the field. In 2016, we awarded a contract to complete build out of our fleet of 58 Fast Response Cutters (FRC) at an affordable price, and just last month we exercised an option to begin production of six FRCs (Sentinel class hulls 39-44). We recently commissioned the 23rd FRC on July 4th and appreciate this Subcommittee's continued support for the program.

In September, we reached a major milestone with the award of a Detail Design and Construction contract for the Offshore Patrol Cutter (OPC). These cutters will eventually comprise 70 percent of Coast Guard surface presence in the offshore zone. OPCs will provide the tools to enforce federal laws more effectively, secure our maritime borders by interdicting threats before they arrive on our shores, disrupt transnational criminal organizations, and respond to 21st-century threats. We will be ordering long lead time material for the first OPC in the next few months to support delivery of the lead hull in 2021.

We have also generated momentum to build new polar icebreakers. A little over one year ago, we made the commitment to partner with the Navy to establish an Integrated Program Office to acquire new heavy polar icebreakers. This approach leverages the expertise of both organizations and is delivering results. The benefits of this partnership were evident in the decision to award multiple Industry Studies contracts, a concept the Navy has utilized in previous shipbuilding acquisitions to drive affordability and reduce schedule and technical risk. We are receiving deliverables from Industry Study teams, which will help us to refine the specification to support delivery of the first heavy icebreaker in late fiscal year 2023. I am happy to report we remain on schedule to release a request for proposal for Detail Design and Construction in fiscal year 2018.

In 2018, we also will evaluate materiel and non-materiel options to replace the capabilities provided by the current fleet of inland tenders and barges commissioned between 1944 and 1990. Given the age and functionality of this fleet, requested funding supports initial Program Management Office exploratory activities to replace this vital capability, including the potential for commercial services and alternative crewing options, as well as recapitalization alternatives.

We are also making progress with unmanned aerial systems. A recent small Unmanned Aircraft System (sUAS) proof of concept aboard a National Security Cutter (NSC) conducted actual interdiction operations, which enhanced the overall effectiveness of the cutter. In its inaugural deployment, the sUAS operated from Coast Guard Cutter STRATTON logged 280 flight hours, provided real-time surveillance and detection imagery for the cutter, and assisted the embarked helicopter and law enforcement teams with the interdiction or disruption of four go-fast vessels carrying more than 5,000 pounds of contraband. A second deployment is currently underway and will provide invaluable information on sensor capabilities and impacts to the host cutter's operational capabilities as we develop a request for proposal for sUAS capabilities across the entire NSC fleet. This cutter-based system will be a tactical game changer for the Coast Guard, complementing our embarked helicopters and cutter boats by equipping our cutters with additional intelligence, surveillance and reconnaissance capabilities.

On the aviation side, we are nearing completion of the C-27J reactivation process and are expecting acceptance of the 14th and final C-27J from the Air Force next month. We are also moving forward with development of mission system suites that integrate command and control and sensor information for HC-130J, HC-144 and C-27J operators.

The enhancements will be based on the Minotaur mission system architecture currently being used by the Department of Defense and DHS and will greatly improve our ability to maintain maritime domain awareness and process/distribute data in real time.

As vigilant stewards of the taxpayers' investment, the Coast Guard is maximizing the capability of our existing fleet of cutters and aircraft through a series of sustainment and enhancement programs. The current work being conducted at the Coast Guard Yard in Curtis Bay, Maryland, includes a Service Life Extension Project to enhance mission readiness and extend the service life of the 140-foot icebreaking tug class by approximately 15 years. These multi-mission assets are key components of the service's efforts to mitigate wintertime flooding and facilitate safe navigation for critical cargos on the Great Lakes and several rivers and harbors in the Northeast. Also, last year, the Coast Guard initiated a Midlife Maintenance Availability on 225-foot sea-going buoy tenders that will address obsolescence of critical ship components and engineering systems. The work on these two platforms is vital to sustaining current mission performance in support of maritime commerce. Similarly in the aviation domain, we are continuing efforts to extend the service life and improve the operational effectiveness of our rotary-wing and fixed-wing aircraft at the Coast Guard's world class depot maintenance facility, the Aviation Logistics Center, located in Elizabeth City, North Carolina.

The Coast Guard is continuing deployment of new and updated C4ISR systems on our assets and at our shore facilities around the country. Rescue 21 and Nationwide Automatic Identification System capabilities are deployed in coastal areas nationwide, and work to expand these systems along the Western Rivers and Alaska are nearing completion. These systems are critical to the Coast Guard's efforts to save lives and enhance maritime awareness in our ports and on inland and coastal waterways. We are also proceeding with installation of enhanced C4ISR systems on board our surface and aviation assets, including deployment of the Sea Commander suite on our NSCs and SeaWatch on our FRCs. This equipment and software provide situational awareness, data processing and information awareness tools required to modernize and recapitalize our shore sites, surface and aviation assets.

While my focus is on executing our acquisition programs, the service is also mindful of our collective need to ensure that the facilities that receive these new assets and the people that will operate and maintain them are properly equipped and trained to meet mission demands. While readiness and modernization investments improve current mission performance, the right force is central to success. The service is incredibly proud of its 88,000 active duty, reserve, civil service, and auxiliary members. Funding 21st-century Coast Guard platforms, infrastructure, and personnel is a smart investment, even in this challenging fiscal environment. Investments in Coast Guard personnel are especially important, as our greatest strength will always be our people. Coast Guard operations require a capable, proficient, and resilient workforce that draws upon the broad range of skills, talents, and experiences found in the American population. Together, modern platforms and a strong, resilient workforce will maximize the Coast Guard's capacity to meet future challenges.

History has proven that a responsive, capable, and agile Coast Guard is an indispensable instrument of national security. Your continued oversight and direction have been critical to our success and with your continued support, we – your Coast Guard – will continue to live up to our motto. We will be *Semper Paratus* – Always Ready. Thank you for the opportunity to testify before you today and for all you do for the men and women of the Coast Guard. I look forward to your questions.

United States Government Accountability Office

GAO

Testimony

Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

For Release on Delivery
Expected at 10:00 a.m. ET
Tuesday, July 25, 2017

COAST GUARD ACQUISITIONS

Limited Strategic Planning Efforts Pose Risk for Future Acquisitions

Statement of Marie A. Mak, Director,
Acquisition and Sourcing Management

GAO Highlights

Highlights of GAO-17-747T, a testimony before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

In order to meet its missions of maritime safety, security, and environmental stewardship, the Coast Guard, a component within the Department of Homeland Security (DHS), employs a variety of assets, several of which are approaching the end of their intended service lives. As part of its efforts to modernize its surface and air assets (known as recapitalization), the Coast Guard has begun acquiring new vessels and air assets. Concerns surrounding the affordability of this effort remain as the Coast Guard continues to pursue new acquisitions such as the polar icebreaker, while also acquiring the Offshore Patrol Cutter—which is estimated to cost $12.1 billion through 2032.

This statement addresses the (1) extent that the Coast Guard develops planning tools to guide its acquisition portfolio, and (2) potential risks the Coast Guard faces in its polar icebreaker acquisition. This statement is based on GAO's extensive body of published and ongoing work examining the Coast Guard's acquisition efforts over several years.

What GAO Recommends

GAO is not making recommendations in this statement but has made them to the Coast Guard and DHS in the past regarding recapitalization, including that the Coast Guard develop a 20-year fleet modernization plan that identifies all acquisitions and the fiscal resources needed to acquire them. DHS agreed with this recommendation.

View GAO-17-747T. For more information, contact Marie Mak at (202) 512-4841 or makm@gao.gov.

July 2017

COAST GUARD ACQUISITIONS

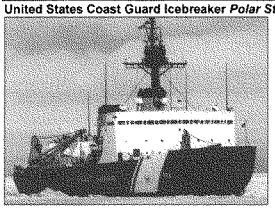
Limited Strategic Planning Efforts Pose Risk for Future Acquisitions

What GAO Found

In June 2014, GAO found that the Coast Guard lacked long-term planning to guide the affordability of its acquisition portfolio and recommended the development of a 20-year fleet modernization plan to identify all acquisitions necessary for maintaining at least its current level of service and the fiscal resources necessary to build and modernize its planned surface and aviation assets. Coast Guard officials stated that they are developing a 20-year Capital Investment Plan (CIP), but the timeframe for completion is unknown. The Coast Guard does, however, submit a 5-year CIP annually to Congress that projects acquisition funding needs for the upcoming 5 years. GAO found the CIPs do not match budget realities in that tradeoffs are not included. In the 20-year CIP, GAO would expect to see all acquisitions needed to maintain current service levels and the fiscal resources to build the identified assets as well as tradeoffs in light of funding constraints.

As GAO reported in June 2016, the Coast Guard's heavy icebreaker fleet was operating at a reduced capacity with only one heavy polar icebreaker in service, resulting in limited access to both the Arctic and Antarctic regions year-round. The Coast Guard's only active heavy icebreaker, the *Polar Star*, is approaching the end of its expected service life, and the Coast Guard plans to implement a limited service life extension to keep it operational until the new icebreaker is available. An official cost estimate has not been completed, but the Coast Guard estimates this extension will cost roughly $75 million.

United States Coast Guard Icebreaker *Polar Star*



Source: U.S. Coast Guard. | GAO-17-747T

Consequently, the Coast Guard expedited its acquisition of new heavy icebreakers with delivery of the first polar icebreaker scheduled in 2023. This delivery schedule poses potential risk as the required acquisition documents may not be completed in time to award the contract in 2019, as currently scheduled. Further, in order to meet this accelerated schedule, the first polar icebreaker would need to be fully funded in fiscal year 2019 with a preliminary cost estimate of $1.15 billion, alongside the Offshore Patrol Cutter acquisition. The Coast Guard has not articulated how it will prioritize its acquisition needs given its Offshore Patrol Cutter is expected to absorb half to two-thirds of its annual acquisition funding requests—based on recent funding history—starting in 2018.

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee:

I am pleased to be here today to discuss key acquisition planning challenges the U.S. Coast Guard—within the Department of Homeland Security (DHS)—faces as it acquires new assets, a set of surface and aviation programs collectively referred to as Coast Guard recapitalization. For example, the Coast Guard's ability to accomplish its recapitalization within its planned budget is not known because the Coast Guard has yet to provide a long-term plan to manage the affordability of its acquisition portfolio. Without understanding the full cost implications of each of its assets—including acquisition costs, sustainment costs, support infrastructure, and personnel needs—the Coast Guard risks experiencing capability gaps if funding levels remain constant. One particular mission that has encountered capability gaps in the past, polar icebreaking, is at risk of undergoing future gaps because the Coast Guard's only operational heavy icebreaker—the *Polar Star*—is approaching the end of its expected service life and, at times, has been unable to provide this capability due to equipment failures.

My statement today will address (1) the extent that the Coast Guard develops planning tools to guide its acquisition portfolio, and (2) potential risks the Coast Guard faces in its polar icebreaker acquisition. This statement is based largely on our extensive body of work examining the Coast Guard's acquisition efforts spanning the past several years but also updated information based on our ongoing work.[1] For the reports cited in this statement, among other methodologies, we analyzed Coast Guard guidance, data, and documentation, and interviewed Coast Guard officials at its headquarters and field units to determine how the Coast Guard allocated its assets, how data are used to make annual asset allocation decisions, and how the Coast Guard determines future resource needs. Each of the reports cited in this statement provide further detailed information on our scope and methodology. For the purposes of

[1]For examples of past work see: GAO, *Coast Guard Cutters: Depot Maintenance Is Affecting Operational Availability and Cost Estimates Should Reflect Actual Expenditures*, GAO-17-218 (Washington, D.C.: Mar. 2, 2017); *National Security Cutter: Enhanced Oversight Needed to Ensure Problems Discovered during Testing and Operations Are Addressed*, GAO-16-148 (Washington, D.C.: Jan. 12, 2016); *Coast Guard Aircraft: Transfer of Fixed-Wing C-27J Aircraft is Complex and Further Fleet Purchases Should Coincide with Study Results*, GAO-15-325 (Washington, D.C.: Mar. 26, 2015); and *Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls*, GAO-14-450 (Washington, D.C.: June 5, 2014).

this hearing, we also analyzed the Coast Guard's annual 5-year Capital Investment Plans (CIPs), from 2013 through 2017, to determine what are included in the plans and how the plans' projections compared to requested and appropriated funds annually. For our ongoing work on the polar icebreaker, we assessed the status of the Coast Guard's efforts to recapitalize its heavy polar icebreaking fleet, and how the Coast Guard is addressing challenges it has identified in implementing this effort. We obtained and analyzed DHS and Coast Guard documentation for the acquisition program, such as acquisition decision memoranda, supporting acquisition planning documents, and cost and schedule information. We also interviewed Coast Guard and Navy officials representing the heavy polar icebreaker project's Integrated Program Office.

We conducted the work on which this statement is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The Coast Guard Develops Annual 5-year CIPs but Needs to Complete Long-Term Planning Document

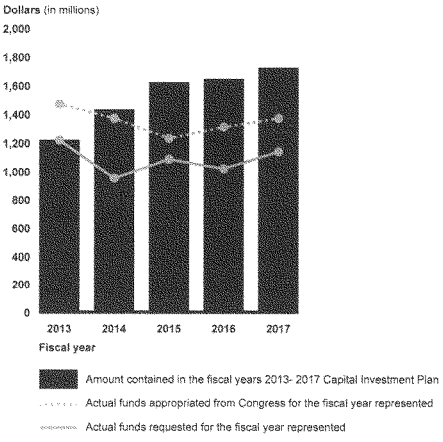
Previous 5-year CIPs' Funding Projections Have Not Matched Annual Budget Requests

Since 2012, the Coast Guard has been legislatively required to submit a CIP annually to certain Congressional committees, alongside its budget proposal, that includes, among other things, projected funding for capital assets in such areas as acquisition, construction, and improvements needed for the upcoming 5 fiscal years.[2] Specifically, this 5-year CIP is intended to provide insight into the proposed budget for the upcoming

[2]14 U.S.C. § 2902. The Capital Investment Plan is approved by the Department of Homeland Security and the Office of Management and Budget.

fiscal year and the following 4 years. The 5-year CIP reports the assets' cost and schedule per the acquisition program baseline; however, we found that it does not consistently reflect current total cost estimates or the effects of tradeoffs that are made as part of the annual budget cycle. For example, in 2014 we reported that in the Fiscal Year 2014 CIP, the Coast Guard proposed decreasing the number of Fast Response Cutters procured per year to two, as opposed to three to six as previously planned for, without altering the total cost estimate in the CIP.[3] Figure 1 highlights the differences using historical estimates depicted in the Coast Guard's Fiscal Year 2013 CIP, which projects acquisition funding from fiscal years 2013 through 2017, as compared to its requested and appropriated funds during this same time period.

Figure 1: Coast Guard's Fiscal Year 2013 through 2017 Capital Investment Plan (CIP) Projections Compared to its Budget Requests and Appropriated Funds



Source: GAO analysis of Coast Guard data. | GAO-17-747T

Note: For fiscal year 2016, Congress directed that of the funds provided by the Consolidated Appropriations Act, 2016, not less than $640 million be immediately available and allotted to contract

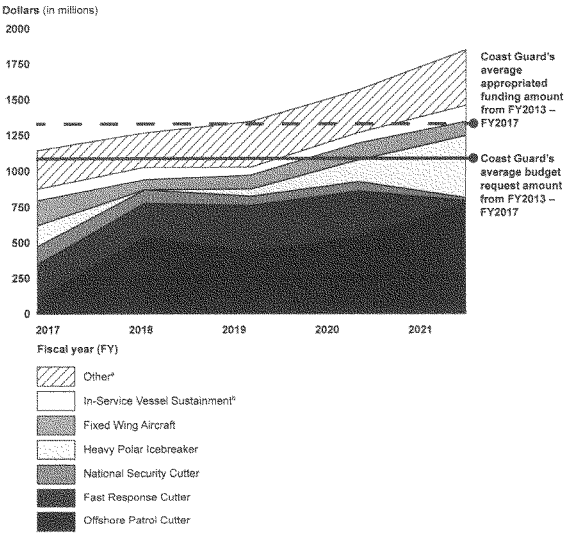
[3]GAO 14-450.

for the production of a 9th National Security Cutter. This amount has been removed from the appropriated total depicted in the graphic since it was not requested by the Coast Guard. All funds in the 5-year CIP are presented in base year dollars.

Moreover, the 5-year CIP does not prioritize acquisition programs in its out year projections which, in part, has led to the Coast Guard's acquisition funding projections frequently exceeding both the requested and appropriated funding amounts. Furthermore, this document does not display tradeoffs or priorities and limits the Coast Guard's ability to manage affordability of its acquisition portfolio, including accurately forecasting its total cost projections.

Furthering the affordability concern, the Offshore Patrol Cutter procurement, for which planned acquisition costs are estimated at $12.1 billion through final delivery in 2034—making it the most expensive Coast Guard acquisition program in its recapitalization effort—will create additional strain on the Coast Guard's acquisition budget. According to the Commandant of the Coast Guard, the Offshore Patrol Cutter is its top priority. As such, the Coast Guard will prioritize its budget requests for the Offshore Patrol Cutter before other assets potentially limiting funds requested for other acquisition programs. Figure 2 provides the Coast Guard's acquisition funding projections from its fiscal year 2017 CIP, for fiscal years 2017 through 2021.

Figure 2: Coast Guard Acquisition, Construction, and Improvement Funding Projections as Depicted in its Fiscal Year 2017 Capital Investment Plan for Fiscal Years 2017 through 2021, by Program



Source: GAO analysis of Coast Guard data. | GAO-17-747T

[a]The "other" category depicted in the graphic contains funding projections for software systems, acquisition personnel, and shore infrastructure, among others.

[b]In-service vessel sustainment represents necessary extensive maintenance and repairs, such as service life extension projects to sustain its legacy vessels.

Note: For fiscal year 2016, Congress directed that of the funds provided by the Consolidated Appropriations Act, 2016, not less than $640 million be immediately available and allotted to contract for the production of a 9th National Security Cutter. This amount has been removed from the appropriated total depicted in the graphic since it was not requested by the Coast Guard. All funds in the 5-year CIP are presented in base year dollars.

As depicted in figure 2, for fiscal years 2017 through 2021, the Coast Guard's projected acquisition funding levels for its major programs exceeds its average budget request of roughly $1.1 billion from 2013 to 2017. Beginning around 2019, these projected acquisition funding levels

exceed the average appropriated funding amount of roughly $1.3 billion that the Coast Guard has received from 2013 to 2017, and which is greater than the Coast Guard's average annual requests. This disconnect highlights that the 5-year CIP does not account for the reality of the constrained budget environment the Coast Guard faces. From our analysis of this CIP, we concluded that in order for the Coast Guard to acquire many of its needed assets over the next 5 years, it will need significantly more appropriated funds than what the Coast Guard typically requests.[4]

Beginning in September 2018, the Offshore Patrol Cutter will absorb roughly one half to about two-thirds of the Coast Guard's annual acquisition funding requests until 2032 if historic funding request levels over the past 4 years continue to remain about the same. Any remaining Coast Guard acquisition programs will have to compete for acquisition funds not requested for the Offshore Patrol Cutter. For instance, the Coast Guard must also recapitalize other assets such as the polar icebreakers—to alleviate an expected capability gap—and refurbish other legacy vessels, such as its fleet of river buoy tenders, as these assets continue to age beyond their expected service lives and, in some cases, have been removed from service without a replacement.

Over the last year, in public hearings before Congress, senior Coast Guard officials have stated a need for over $2 billion per year for acquisitions. However, in the President's Budget, the Coast Guard requested $1.1 billion for fiscal year 2017 and $1.2 billion for fiscal year 2018. As we previously reported, in an effort to address the funding constraints it has faced annually, the Coast Guard has been in a reactive mode, delaying and reducing its capabilities through the annual budget process by moving planned acquisitions into future years, and does not have a plan to realistically set forth affordable priorities.[5] The Coast Guard currently has no method in place to capture the effects of these deferred acquisitions on its future portfolio, which will result in significant capability gaps if funding does not materialize and a "bow wave" of near-

[4]For the purposes of this hearing, we analyzed the Coast Guard's annual 5-year CIPs, from 2013 through 2017, to determine what are included in the plans and how the plans' projections compared to requested and appropriated funds annually.

[5]GAO, *Coast Guard Recapitalization: Matching Needs and Resources Continue to Strain Acquisition Efforts*, GAO-17-654T (Washington, D.C.:June 7, 2017).

term unfunded requirements will be created, negatively affecting future acquisition efforts.[6]

The Coast Guard is Developing a Long-Term Acquisition Planning Document, but Its Completion Date and Contents are Unknown

In 2014, we recommended that the Coast Guard develop a 20-year fleet modernization plan that would identify all acquisitions necessary for maintaining at least its current level of service and the fiscal resources necessary to build these assets.[7] DHS concurred with this recommendation and the Coast Guard is in the process of developing this document to guide and manage the affordability of its acquisition portfolio. Such an analysis would facilitate a full understanding of the affordability challenges facing the Coast Guard while it builds the Offshore Patrol Cutter, among other major acquisitions. Coast Guard officials report an ongoing effort to produce a 20-year plan—which the Coast Guard refers to as a 20-year CIP—but has not articulated a timeframe for when this plan will be completed or what information it will include. As we stated in our 2014 report, in line with the Office of Management and Budget's capital planning guidance referenced by the Coast Guard's Major Systems Acquisition Manual, we would expect the 20-year CIP to include, among other things:

- an analysis of the portfolio of assets already owned by the agency and in procurement,
- the performance gap and capability necessary to bridge the old and new assets, and
- a justification for new acquisitions proposed for funding.[8]

[6]According to GAO's schedule assessment guide and cost estimating and assessment guide, bow wave refers to large amount of funding that will be required in the future to complete an acquisition due to deferred or delayed work. Often the funding required at the peak of a bow wave is unrealistic. See GAO, *Schedule Assessment Guide: Best Practices for Project Schedules*, GAO-12-12OG (Washington, D.C.: May 2012) and *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: March 2009).

[7]GAO-14-450.

[8]Capital Programming Guide, ver 3.0, Supplement to Office of Management and Budget Circular A-11: Planning, Budgeting, and Acquisition of Capital Assets, 2016. The Major Systems Acquisition Manual defines the policy and process for the Coast Guard's major systems acquisition programs. Detailed procedures are provided for applying a uniform and disciplined approach to acquisition planning and program management from mission analysis and requirements generation through design, development, production, and deployment.

As we have noted in our past work, a long-term plan that also includes acquisition implications, such as sustainment costs, and support infrastructure and personnel needs, would enable tradeoffs to be identified and addressed in advance, leading to better informed choices and making debate possible before irreversible commitments are made to individual programs. Without this type of plan, decision makers do not have the information they need to better understand and address the Coast Guard's long-term outlook.[9]

Potential Risks Exist in the Coast Guard's Accelerated Acquisition Schedule for Heavy Icebreakers and Coast Guard Plans to Mitigate Potential Icebreaking Capability Gap

Coast Guard Has Initiated a New Acquisition for Heavy Icebreakers, but Accelerated Acquisition Schedule Poses Potential Risk

The Coast Guard initiated the acquisition of a new fleet of heavy polar icebreakers in 2013, but now faces potential schedule and cost risks in implementing an accelerated acquisition approach.[10] In June 2016, we reported that the Coast Guard's heavy icebreaking fleet had been operating at a reduced capacity after one of its ships, the *Polar Sea*, suffered a catastrophic engine failure in 2010, rendering it inactive.[11] As a result, the Coast Guard reports that it has not been able to provide year-round access to both the Arctic and Antarctic regions. Specifically, from 2010 to 2013, the Coast Guard was unable to fulfill the National Science Foundation's request for the annual resupply of its McMurdo Station

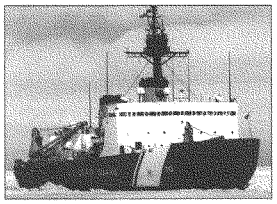
[9]GAO-14-450.

[10]The Coast Guard currently plans to acquire three heavy icebreakers and three medium icebreakers.

[11]GAO, *Coast Guard: Arctic Strategy Is Underway, but Agency Could Better Assess How Its Actions Mitigate Known Arctic Capability Gaps*, GAO-16-453 (Washington, D.C.: June 15, 2016).

research center in Antarctica as both of its heavy polar icebreakers were inactive due to maintenance needs. The Coast Guard resumed this annual mission in 2014 following the reactivation of its other heavy icebreaker, the *Polar Star*, which is shown in figure 3.

Figure 3: United States Coast Guard Icebreaker *Polar Star*



Source: U.S. Coast Guard. | GAO-17-747T

In order to provide continued access to the Arctic and Antarctic regions, the Coast Guard initiated a program in 2013 to acquire a fleet of three new heavy polar icebreakers.[12] The Coast Guard is currently planning for the first new heavy polar icebreaker to be delivered in fiscal year 2023, which has been accelerated from a previous estimate of 2026. The accelerated schedule was implemented at the direction of the last Administration, and confirmed by the current Administration. To meet its goal of delivering the first icebreaker in fiscal year 2023, the Coast Guard has partnered with the Navy to leverage the Navy's shipbuilding expertise. These agencies established an integrated program office, which was formalized in January 2017, to collaborate on developing and implementing an acquisition approach.

The Coast Guard has made progress in advancing through the acquisition process for the new heavy polar icebreaker by completing certain efforts, such as establishing requirements and engaging the shipbuilding industry, but the accelerated schedule it is pursuing poses potential risk. Specifically, there is a risk that the acquisition planning documents required to receive DHS approval to begin development

[12]ABS Consulting, *United States Coast Guard High Latitude Region Mission Analysis Capstone Summary*, prepared for the United States Coast Guard, (July 2010). This study concluded that a fleet of three heavy and three medium icebreakers would be required to fulfill all of the Coast Guard's statutory missions.

efforts—and which are necessary under DHS acquisition policy for the anticipated contract award in fiscal year 2019—might not be completed on schedule. The Coast Guard acknowledged this in its 2017 annual program review and stated that should the acquisition planning documents not be completed and approved by the end of fiscal year 2017, the program may be unable to meet its schedule for entering the obtain phase in early fiscal year 2018.[13] Should this happen, officials reported they may be unable to release the request for proposals for detailed design and construction—a key step in the acquisition process—as scheduled in mid-fiscal year 2018, which could delay the contract award scheduled in fiscal year 2019 and extend the proposed delivery date.

Further, the Navy and Coast Guard have established a preliminary cost estimate of $1.15 billion for the lead heavy polar icebreaker, though they are working to reduce this estimate. For example, Coast Guard officials stated that they have identified $97 million in potential savings, which is based partially on reduced power requirements, since modern icebreaker designs are more efficient than the Coast Guard's existing heavy icebreaker. To meet its accelerated schedule, the program will need to be fully funded in fiscal year 2019. In fiscal year 2017, Congress appropriated a total of $150 million to the Navy for the polar icebreaker's advanced procurement and the explanatory statement of the DHS Appropriations Act, 2017 reflected $25 million for the Coast Guard acquisition of a polar icebreaker.[14]

Another potential challenge is that the Coast Guard may be executing the polar icebreaker acquisition with Navy funding. For example, $150 million in polar icebreaker funding was provided to the Navy. While this approach alleviates some of the affordability issues within the Coast Guard's budget, it is unclear exactly what roles the Navy and Coast Guard will have if this funding arrangement continues. For instance, if the Navy receives the funding then it would be responsible for contracting for the icebreakers, but the program would follow DHS's acquisition guidance.

[13]The obtain phase in DHS's acquisition process requires the program manager to develop, test, and evaluate the selected option. This phase occurs once a need has been identified and alternative approaches to meeting the need have been fully examined. The obtain phase is the last phase before DHS pursues production and delivers the new capability to its operators to support the capability until it is retired.

[14]Explanatory Statement on Department of Homeland Security Appropriations Act, 2017, contained in Division F of the Consolidated Appropriations Act, 2017, Pub. L. No. 115-31.

This would be an unusual relationship and it is unclear how potential conflicts would be resolved. This is an issue we will pursue in our ongoing work on the acquisition of the polar icebreaker.

Coast Guard Plans to Extend *Polar Star*'s Service Life to Reduce Capability Gap, but Estimated Cost of Service Life Extension May Be Unrealistic

As noted, the Coast Guard currently has only one operational heavy icebreaker, the *Polar Star*. We reported in June 2016 that, following its reactivation in 2013, the *Polar Star's* end of service life is projected to be between fiscal years 2020 and 2023.[15] As the new heavy polar icebreaker is not expected to be delivered until at least 2023, there could be a gap in the Coast Guard's heavy icebreaking capability. To ensure that the Coast Guard retains a heavy icebreaking capability until a new heavy icebreaker is operational, the Coast Guard completed a study in January 2017 to determine the cost of reactivating *Polar Sea* and extending the life of the *Polar Star* for 7 to 10 years as potential "bridging" strategies.[16] Table 1 shows the results of the study, reported in January 2017.

Table 1: Estimated Costs to Reactivate *Polar Sea* and Extend *Polar Star* to Bridge a Potential Heavy Icebreaking Capability Gap (in millions)

	Reactivate *Polar Sea* for 7-10 years	Reactivate *Polar Sea* for 10-15 years	Reactivate *Polar Sea* for 15-20 years	Extend *Polar Star* for 7-10 years
Estimated total acquisition cost	$489	$551	$641	$426
Estimated lifecycle cost	$984	$1,347	$1,729	$934
Project duration	8 years	8.5 years	9 years	7.5 years

Source: GAO presentation of Coast Guard data from *Polar Sea* Assessment study. | GAO-17-747T

The Coast Guard is not currently planning to pursue any of these four options identified in the January 2017 study as they were deemed too expensive, among other reasons. Instead, Coast Guard officials stated they are planning to conduct a limited service life extension of the *Polar Star* to address key components and keep it operational until fiscal year 2025, when a second new heavy polar icebreaker is expected to be delivered. According to officials, the Coast Guard is currently conducting an assessment of the *Polar Star* to determine what systems would need to be overhauled and replaced to meet this goal. An official cost estimate

[15]GAO-16-453.

[16]United Stated Coast Guard, *Polar Sea Assessment: Report to Congress*, January 23, 2017.

for this effort has not been completed yet, but the fiscal year 2017 CIP includes a total of roughly $75 million towards this effort in fiscal years 2019 through 2021. However, the $75 million estimate may be unrealistic based on the assumptions the Coast Guard used, such as continuing to use parts from the *Polar Sea* as has been done in previous maintenance events. As a result of the finite parts available from the *Polar Sea*, the Coast Guard may have to acquire new parts for the *Polar Star* that could increase the $75 million estimate.

In conclusion, as the Coast Guard continues its recapitalization effort, it is important that it plans for the affordability of its future portfolio so that it can minimize the capability gaps that can occur when legacy assets reach the end of their service lives before new assets become operational. We have made several recommendations in recent years intended to help the Coast Guard plan for these future acquisitions and the difficult tradeoff decisions that it will likely face.[17] If the Coast Guard fully implements these recommendations, it could provide decision makers with critical knowledge needed to prioritize its constrained acquisition funding. Without these efforts, the Coast Guard will continue, as it has in recent years, to plan its future acquisitions through the annual budgeting process, a process that has led to delayed and reduced capabilities. A thorough plan regarding the affordability of its future acquisitions would provide timely information to decision makers on how to spend scarce taxpayer dollars in support of a modern, capable Coast Guard fleet.

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to respond to any questions.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this statement, please contact Marie A. Mak, (202) 512-4841 or makm@gao.gov. In addition, contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Individuals who made key contributions to this testimony include Jennifer Grover, Director; Richard A. Cederholm, Assistant Director; Dawn Hoff, Assistant

[17]For a list of the recent recommendations related to acquisitions planning we have made, please see Appendix I.

Director; Peter W. Anderson; Jason Berman; Erin Butkowski; John Crawford; Laurier Fish; Camille Henley; Hugh Paquette; and Roxanna T. Sun.

Appendix I: List of GAO Recommendations Related to the Coast Guard's Planning Efforts for Future Acquisitions

GAO has made several recommendations in recent years related to the Coast Guard's efforts to conduct long-term planning. Table 2 contains a selected list of the recommendations, whether DHS or the Coast Guard concurred or not, and the status of its implementation.

Table 2: GAO Recommendations Related to the Coast Guard's Strategic Planning Efforts

Report	Recommendation	Concur or non-concur	Status of implementation
GAO-12-833	We recommend that the Secretary of the Department of Homeland Security prioritize major acquisition programs department wide and ensure that the department's acquisition portfolio is consistent with DHS's anticipated resource constraints	Concur	Open – Not Implemented
GAO-12-918	We recommend that the Commandant of the Coast Guard conduct a comprehensive portfolio review to develop revised baselines that reflect acquisition priorities as well as realistic funding scenarios.	Concur	Open – Not Implemented
GAO-14-450	We recommend that the Commandant of the Coast Guard develop a 20-year fleet modernization plan that identifies all acquisitions needed to maintain the current level of service and the fiscal resources necessary to build the identified assets. The plan should also consider trade-offs if the fiscal resources needed to execute the plan are not consistent with annual budgets.	Concur	Open – Not Implemented

Source: Presentation of selected GAO recommendations. | GAO-17-747T

Note: GAO, *Homeland Security: DHS Requires More Disciplined Investment Management to Help Meet Mission Needs*, GAO-12-833 (Washington, D.C.: Sept. 18, 2012); *Coast Guard: Portfolio Management Approach Needed to Improve Major Acquisition Outcomes*, GAO-12-918 (Washington, D.C.: Sept. 20, 2012); and *Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls*, GAO-14-450 (Washington, D.C.: June 5, 2014).

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TESTIMONY

Statement of

Ronald O'Rourke
Specialist in Naval Affairs

Before

House Transportation and Infrastructure Committee
Coast Guard and Maritime Transportation Subcommittee

Hearing on

Building a 21st Century Infrastructure for America: Coast Guard Sea, Air, and Land Capabilities: Part II

July 25, 2017

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CRS TESTIMONY
Prepared for Congress

Chairman Hunter, Ranking Member Garamendi, distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss building a 21st century infrastructure for America: Coast Guard sea, air, and land capabilities.

As requested, my testimony focuses on Coast Guard ship acquisition. I have been working on military ship acquisition issues for Congress for 33 years, including Coast Guard ship acquisition issues for almost 20 years.[1] I currently maintain CRS reports for Congress on cutter acquisition and the polar icebreaker program.[2] For additional reference, this statement includes a summary of acquisition lessons learned for Navy shipbuilding in **Appendix A**, and some considerations on the use of warranties in shipbuilding contracts in **Appendix B**.

Funding Level for Coast Guard's Acquisition (AC&I) Account

Coast Guard Officials Now Regularly Mention a Figure of $2 Billion per Year

Much of the discussion in recent years about Coast Guard acquisition has focused on past, current, and potential future funding levels for the Coast Guard's Acquisition, Construction, and Improvements (AC&I) account. Coast Guard officials this year have begun stating regularly what they stated only infrequently in previous years: that executing the Coast Guard's various acquisition programs fully and on a timely basis will require the AC&I account to be funded in coming years at a level of about $2 billion per year. Statements from Coast Guard officials on this issue in past years have sometimes put this figure as high as about $2.5 billion per year.[3]

Navy Shipbuilding Funding Requests Have Increased Substantially During the Years of the BCA

An annual AC&I funding level of $2 billion or $2.5 billion per year would represent something like a 100% increase over requested amounts for the AC&I account in recent years. That may make the achievement of a funding level of $2 billion or $2.5 billion per year look daunting.

By way of comparison, however, it can be noted that Navy in recent years has testified to a need for substantially increasing the size of the Navy's shipbuilding account—known formally as the Shipbuilding and Conversion, Navy, or SCN, account—and that requested funding levels for this account have increased substantially in recent years, notwithstanding the caps on defense spending under the Budget Control Act (BCA). The Navy's FY2013 budget—the first budget submitted after enactment of the BCA in 2011—requested a total of $13.58 billion for the SCN account. Five years later, with the BCA, as amended, still in place, the Navy's FY2018 budget, as amended on June 29, 2017, requests a total $20.40

[1] See, for example, CRS Report 98-830 F, *Coast Guard Integrated Deepwater System: Background and Issues for Congress*, October 5, 1998, by Ronald O'Rourke.

[2] CRS Report R42567, *Coast Guard Cutter Procurement: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL34391, *Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress*, by Ronald O'Rourke.

[3] See, for example, the spoken testimony of Admiral Robert Papp, then-Commandant of the Coast Guard, before this subcommittee on October 4, 2011, and remarks by Coast Guard Rear Admiral Mark Butt at the 2012 Navy League Sea Air Space conference, as quoted in David Perera, "The Coast Guard Is Shrinking," *FierceHomelandSecurity.com*, April 18, 2012.

billion for the SCN account—an increase of about $6.8 billion, or about 50%, over the FY2013 requested figure.

A 50% increase over the amount requested for the AC&I account for FY2013 ($1.217 billion) or the amount requested for the AC&I account FY2018 ($1.204 billion) would equate to an AC&I funding level of about $1.8 billion, which is fairly close to the figure of $2 billion being mentioned this year by Coast Guard officials. Under the Coast Guard's FY2013 budget submission, the AC&I account was projected to increase to $1.722 billion by FY2017; under the service's FY2017 budget submission, it was projected to increase to $1.841 billion by FY2021.

Using Past AC&I Funding Levels as a Guide for Future AC&I Funding Levels Poses Issues

In assessing future funding levels for executive branch agencies, a common practice is to assume or predict that the figure in coming years will likely be close to where it has been in previous years. While this method can be of analytical and planning value, for an agency like the Coast Guard, which goes through periods with less acquisition of major platforms and periods with more acquisition of major platforms, this approach might not always be the best approach, at least for the AC&I account.

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

Planned Force-Level Goals for New Cutters Have Remained Unchanged Since to 2004

As I have noted in previous testimony and reports, the Coast Guard's program of record for National Security Cutters (NSCs), Offshore patrol Cutters (OPCs), and Fast Response Cutters (FRCs) includes only about 61% as many cutters as the Coast Guard calculated in 2009 would be needed to fully perform its projected future missions.[4] The Coast Guard's planned force levels for NSCs, OPCs, and FRCs have remained unchanged since 2004. In contrast, the Navy since 2004 has adjusted its ship force-level goals eight times in response to changing strategic and budgetary circumstances.[5]

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

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[4] See Appendix A of CRS Report R42567, *Coast Guard Cutter Procurement: Background and Issues for Congress*, by Ronald O'Rourke.

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

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

Funding Coast Guard Ships Through Navy's Shipbuilding Account

As a supplemental means of funding the acquisition of Coast Guard ships, Congress has the option of providing funding for the acquisition of Coast Guard ships through the SCN account. Although this approach creates some complexity in tracking and executing funding for Coast Guard ship acquisition, it has been used in the past. The Coast Guard's medium polar icebreaker, *Healy*, was funded largely through the SCN account,[6] and the FY2017 Department of Defense appropriations act (Division C of H.R. 244/P.L. 115-31 of May 5, 2017) provided $150 million for the current polar icebreaker program.

On three occasions in recent years—in 2002, 2006, and 2013—Navy and Coast Guard leaders have signed a joint National Fleet Policy Statement to provide (as stated in the 2013 edition) "direction and guidance for our Services to achieve commonality and interoperability for 21st century maritime and naval operations." The document states that "This Policy is particularly important in light of: significantly constrained fiscal resources; the growing costs of acquiring, training, and maintaining technologically advanced forces; and the complexity and lethality of national security threats and challenges confronting the Nation in and from the maritime domain." It states further that "This Policy enables Navy and Coast Guard forces to effectively and efficiently support each other while identifying specific methods and measurements, avoid redundancies and achieve economies of scale to maximize our Nation's investment of increasingly scarce resources."[7]

[6] The somewhat complicated funding history for the ship is as follows: The Coast Guard's proposed FY1990 budget requested $244 million for the acquisition of an icebreaker. The FY1990 DOD appropriations act (H.R. 3072/P.L. 101-165 of November 21, 1989) provided $329 million for the ship in the SCN account. (See pages 77 and 78 of H.Rept. 101-345 of November 13, 1989.) This figure was then reduced by $4.2 million by a sequester carried out under the Balanced Budget And Emergency Deficit Control Act of 1985, also known as the Gramm-Rudman-Hollings Act (H.J.Res. 372/P.L. 99-177 of December 12, 1985). Another $50 million was rescinded by the Dire Emergency Supplemental Appropriations for Disaster Assistance, Food Stamps, Unemployment Compensation Administration, and Other Urgent Needs, and Transfers, and Reducing Funds Budgeted for Military Spending Act of 1990 (H.R. 4404/P.L. 101-302 of May 25, 1990). An additional $59 million for the ship was then appropriated in the FY1992 DOD Appropriations Act (H.R. 2521/P.L. 102-172 of November 26, 1991). Also, an additional $40.4 million in acquisition funding for the ship was provided through a series of annual appropriations in the Coast Guard's AC&I account from FY1988 through FY2001. The resulting net funding for the ship was thus $374.2 million, of which $333.8 million, or 89.2%, was DOD funding, and $40.4 million, or 10.8%, was Coast Guard acquisition funding. (Source: Undated Coast Guard information paper provided to CRS by Coast Guard legislative liaison office, March 3, 2016.)

[7] *The National Fleet, A Joint Untied States Navy and United States Coast Guard Policy Statement*, undated but issued in 2013. Accessed July 17, 2017, at: https://www.uscg.mil/seniorleadership/DOCS/National%20Fleet%20Policy%20-%20signed%2025Jun13.pdf.

OPC Program: Option for Reducing Cost Through Multiyear Contracting

As I have testified previously to this subcommittee,[8] the Navy in recent years, with congressional approval, has made significant use of multiyear contracting (i.e., multiyear procurement [MYP] and block buy contracting) in its shipbuilding and aircraft acquisition programs.[9] Among other things, the Navy in recent years has used multiyear contracting for all three of its year-to-year shipbuilding programs—the Virginia-class attack submarine program, the DDG-51 destroyer program, and the Littoral Combat Ship (LCS) program. These three programs account for more than two-thirds of all the ships in the Navy's five-year shipbuilding plans in recent years. Savings from the use of MYP recently have, among other things, helped Congress and the Navy to convert a nine-ship buy of DDG-51 class destroyers in FY2013-FY2017 into a 10-ship buy, and a nine-ship buy of Virginia-class attack submarines in FY2014-FY2018 into a 10-ship buy. The Navy is also now using block buy contracting in the John Lewis (TAO-205) class oiler program.[10] In contrast, the Coast Guard to date has not used multiyear contracting for its shipbuilding or other acquisition programs.

As I have testified previously to this subcommittee, using multiyear contracting in the 25-ship OPC program—specifically, block buy contracting with economic order quantity (EOQ) authority for the initial ships in the program,[11] followed by either block buy contracting with EOQ authority or multiyear procurement (MYP) contracting for later ships in the program—rather than annual contracting might reduce the total acquisition cost of the program by about $1 billion,[12] a savings (which would accumulate over time) equivalent to or a bit greater than the acquisition cost of either a polar icebreaker or a 35-ship program to replace Coast Guard's current 35-ship inland waterways fleet.

This potential savings of $1 billion represents a once-in-a-generation opportunity for using multiyear contracting to reduce the cost of an individual Coast Guard acquisition program by such an amount. The $1 billion in potential savings is considerably greater than the savings (discussed later in this statement) that might be achieved by using multiyear contracting in the polar icebreaker acquisition program.

The Coast Guard is currently using a contract with options for acquiring the first nine ships in the OPC program. Although a contract with options may look like a form of multiyear contracting, it is not an

[8] See, for example, Statement of Ronald O'Rourke, Specialist in Naval Affairs, Before [the] House Transportation and Infrastructure Committee, Coast Guard and Maritime Transportation Subcommittee Hearing on The Status of Coast Guard Cutter Acquisition Programs, February 3, 2016, p. 5.

[9] As I have testified previously, from a congressional perspective, tradeoffs in making greater use of multiyear contracting include the following: reduced congressional control over year-to-year spending, and tying the hands of future Congresses; reduced flexibility for making changes in acquisition programs in response to unforeseen changes in strategic or budgetary circumstances (which can cause any needed funding reductions to fall more heavily on acquisition programs not covered by multiyear contracts); a potential need to shift funding from later fiscal years to earlier fiscal years to fund EOQ purchases of components; the risk of having to make penalty payments to shipbuilders if multiyear contracts need to be terminated due to unavailability of funds needed for the continuation of the contracts; and the risk that materials and components purchased for ships to be procured in future years might go to waste if those ships are not eventually procured. Congress has considered these tradeoffs in deciding whether to grant the Navy authority for using multiyear contracting in the service's shipbuilding and other acquisition programs.

[10] For additional discussion of multiyear 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.

[11] EOQ authority is authority to make up-front batch purchases of selected components of all the end items (in this case, ships) that are to be acquired under the contract.

[12] See, for example, Statement of Ronald O'Rourke, Specialist in Naval Affairs, Before [the] House Transportation and Infrastructure Committee, Coast Guard and Maritime Transportation Subcommittee Hearing on The Status of Coast Guard Cutter Acquisition Programs, February 3, 2016, p. 5.

example of multiyear contracting. Contracts with options operate more like annual contracting, and they do not achieve the savings that can be achieved through multiyear contracting. Acquiring the first nine ships in the OPC program under the current contract with options could forego roughly $350 million of the $1 billion in potential savings.

One option for the subcommittee would be to look into the possibility of having the Coast Guard either convert the current OPC contract at an early juncture into a block buy contract with EOQ authority, or if conversion is not possible, replace the current contract at an early juncture with a block buy contract with EOQ authority.[13] Replacing the current contract with a block buy contract might require re-competing the program, which would require effort on the Coast Guard's part and could create business risk for Eastern Shipbuilding Group, the shipbuilder that holds the current contract. On the other hand, the cost to the Coast Guard of re-competing the program would arguably be small relative to a potential additional savings of perhaps $300 million, and Eastern arguably would have a learning curve advantage in any new competition by virtue of its experience in building the first OPC.

OPC Program: Option for Increasing Procurement Rate to Complete Program Sooner

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

One possible option for addressing this situation would be to increase the maximum annual OPC procurement rate from the currently planned two ships per year to three or four ships per year. Doing this could result in the 25th OPC being delivered about four years or six years sooner, respectively, than under the currently planned maximum rate. Increasing the OPC procurement rate to three or four ships per year would require a substantial increase to the Coast Guard's AC&I account, which gets back to the issue discussed earlier of future funding levels for that account and Congress's agency in setting funding levels and determining the composition of federal spending.

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

- increasing the production rate to three or four ships per year at Eastern Shipbuilding—an option that would depend on Eastern Shipbuilding's production capacity;
- introducing a second shipyard to build Eastern's design for the OPC;

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

- introducing a second shipyard (such as one of the other two OPC program finalists) to build its own design for the OPC—an option that would result in two OPC classes; or
- building additional NSCs in the place of some of the OPCs—an option that might include de-scoping equipment on those NSCs where possible to reduce their acquisition cost and make their capabilities more like that of the OPC. Such an approach would be broadly similar to how the Navy is planning to use a de-scoped version of the San Antonio (LPD-17) class amphibious ship as the basis for its planned LX(R) class amphibious ships.[14]

Polar Icebreakers: Option for Reducing Cost Through Block Buy Contracting

In previous testimony and reports, I have provided estimates of the savings that might be achieved by using block buy contracting rather than annual contracting for acquiring polar icebreakers. Most recently, in my CRS report on the polar icebreaker program, I have estimated that using a block buy contract that included EOQ purchases would reduce the combined acquisition cost of three heavy polar icebreakers by upwards of 7%, which could equate to a savings of upwards of $200 million.

The new report on polar icebreaker acquisition from the National Academies of Sciences, Engineering, and Medicine (NASEM) recommends acquiring four science-ready heavy polar icebreakers built in series to a common design as the most cost-effective approach for meeting U.S. needs for both heavy and medium polar icebreakers.[15] The savings from using a block buy contract with EOQ purchases on such a four-ship acquisition would be greater than the savings on a three-ship heavy polar icebreaker acquisition.

If policymakers decide to procure five or six science-ready heavy polar icebreakers built in series to a common design, the savings of using block buy contracting with EOQ purchases could be greater still—in a six-ship program, I estimate, the savings could exceed $400 million. The NASEM report notes that its recommended approach would additionally avoid incurring the design and engineering costs (estimated in the report at $126 million) for a separate class of medium polar icebreakers.

Inland Waterways Fleet

The Coast Guard is in the early stages of analysis for an anticipated recapitalization of the service's inland waterways fleet of river tenders, construction tenders, and inland buoy tenders. The Coast Guard has testified that replacements for these tenders might cost about $25 million each.[16]

It is not clear yet whether the 35 existing tenders will need to be replaced on a strict one-for-one basis—the Coast Guard is now examining that issue—but using the figure of $25 million, the total acquisition cost of a 35-unit replacement program might be roughly $875 million, although this figure might be reduced through use of multiyear contracting. Numerous U.S. shipyards—including shipyards that are not capable of building the Coast Guard's larger and more complex cutters—might be interested in bidding for this program.

[14] For additional discussion, see CRS Report R43546, *Navy John Lewis (TAO-205) Class Oiler Shipbuilding Program: Background and Issues for Congress*, by Ronald O'Rourke.

[15] Division on Earth and Life Studies and Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine, *Acquisition and Operation of Polar Icebreakers: Fulfilling the Nation's Needs, Letter Report*, cover letter dated July 11, 2017, 147 pp.

[16] Spoken testimony of Vice Admiral Sandra Stosz, Deputy Coast Guard Commandant, Mission Support, at a June 7, 2017, hearing on Coast Guard Sea, Land and Air Capabilities before this subcommittee, as reflected in transcript of hearing.

Mr. Chairman, this concludes my statement. Thank you again for the opportunity to testify, and I will be pleased to respond to any questions the subcommittee may have.

Appendix A. A Summary of Some Acquisition Lessons Learned for Navy Shipbuilding

A general summary of lessons learned in Navy shipbuilding, reflecting comments made repeatedly by various sources over the years, includes the following:

- **At the outset, get the operational requirements for the program right.** Properly identify the program's operational requirements at the outset. Manage risk by not trying to do too much in terms of the program's operational requirements, and perhaps seek a so-called 70%-to-80% solution (i.e., a design that is intended to provide 70%-80% of desired or ideal capabilities). Achieve a realistic balance up front between operational requirements, risks, and estimated costs.
- **Impose cost discipline up front.** Use realistic price estimates, and consider not only development and procurement costs, but life-cycle operation and support (O&S) costs.
- **Employ competition** where possible in the awarding of design and construction contracts.
- **Use a contract type that is appropriate for the amount of risk involved**, and structure its terms to align incentives with desired outcomes.
- **Minimize design/construction concurrency** by developing the design to a high level of completion before starting construction and by resisting changes in requirements (and consequent design changes) during construction.
- **Properly supervise construction work.** Maintain an adequate number of properly trained Supervisor of Shipbuilding (SUPSHIP) personnel.
- **Provide stability for industry**, in part by using, where possible, multiyear procurement (MYP) or block buy contracting.
- **Maintain a capable government acquisition workforce** that understands what it is buying, as well as the above points.

Identifying these lessons is not the hard part—most if not all these points have been cited for years. The hard part is living up to them without letting circumstances lead program-execution efforts away from these.

Appendix B. Some Considerations Relating to Warranties in Shipbuilding and Other Defense Acquisition

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

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

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

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

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

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

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

maintainability, supportability, availability, and life-cycle costs. Decision factors that must be evaluated include the state of the weapon system technology, the size of the warranted population, the likelihood that field performance requirements can be achieved, and the warranty period of performance.[17]

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

Table 1: FY 2018 – FY 2020 Five Year Capital Investment Plan - Summary

FY 2018 - FY 2022 Five Year Capital Investment Plan
Acquisition, Construction & Improvements

(Thousands of dollars, budget year dollars)	FY 2018 PRESBUD	FY 2019	FY 2020	FY 2021	FY 2022
Vessels	**$877,100**	**$939,750**	**$1,110,250**	**$1,307,750**	**$1,178,100**
Survey and Design - Vessels and Boats	$1,500	$1,000	$1,000	$2,000	$4,500
In-Service Vessel Sustainment	$60,500	$63,750	$80,250	$82,600	$93,500
National Security Cutter (NSC)	$54,000	$65,000	$65,000	$21,000	$6,600
Offshore Patrol Cutter (OPC)	$500,000	$400,000	$457,000	$716,000	$700,000
Fast Response Cutter (FRC)	$240,000	$335,000	$335,000	$26,000	$18,000
Cutter Boats	$1,000	$5,000	$2,000	$3,150	$2,500
Inland Waterways and Western Rivers Tender	$1,100	$5,000	$5,000	$12,000	$38,000
Polar Icebreaker	$19,000	$50,000	$150,000	$430,000	$300,000
Polar Sustainment	$0	$15,000	$15,000	$15,000	$15,000
Aircraft	**$82,600**	**$150,000**	**$222,000**	**$180,000**	**$225,000**
HC-144A Conversion/Sustainment	$0	$17,000	$45,000	$0	$0
HC-27J Conversion/Sustainment	$52,000	$80,000	$100,000	$100,000	$40,000
HH-65 Conversion/Sustainment	$22,000	$47,000	$52,000	$50,000	$50,000
MH-60T Sustainment	$2,500	$0	$1,000	$5,000	$35,000
HC-130J Acquisition/Conversion/Sustainment	$5,600	$0	$18,000	$0	$100,000
Small Unmanned Aircraft System (sUAS)	$500	$6,000	$6,000	$25,000	$0
Other	**$50,800**	**$59,000**	**$37,200**	**$35,900**	**$30,000**
Program Oversight and Management	$15,000	$20,000	$20,000	$20,000	$20,000
C4ISR	$22,000	$22,300	$7,300	$7,300	$7,000
CG-LIMS	$9,800	$13,200	$6,400	$5,100	$0
Other Equipment and Systems	$4,000	$3,500	$3,500	$3,500	$3,000
Shore and ATON	**$75,000**	**$96,500**	**$116,500**	**$169,000**	**$134,500**
Major Shore, Housing, AtoN and S&D	$10,000	$30,000	$38,000	$85,000	$40,000
Major Acquisition Systems Infrastructure	$60,000	$61,500	$73,500	$79,000	$89,500
Minor Shore	$5,000	$5,000	$5,000	$5,000	$5,000
Personnel and Management	**$118,245**	**$115,638**	**$116,730**	**$117,993**	**$119,881**
Direct Personnel Costs	$118,245	$115,638	$116,730	$117,993	$119,881
TOTAL	**$1,203,745**	**$1,360,888**	**$1,602,680**	**$1,810,643**	**$1,687,481**

Defense Related Activities

May 22, 2014
Fiscal Year 2014 Report to Congress

Homeland Security

United States Coast Guard

Foreword

The Coast Guard presents the following report on "Defense Related Activities," as required by the *Department of Homeland Security Appropriations Act, 2014* (Pub. L. 113-76).

This language directs the Commandant to provide an analysis of all defense related expenses within the Coast Guard's appropriations, using the April 1998 GAO Report on *U.S. Coast Guard Use of DOD Funds for National Security Functions*, as the basis for defining National Security Functions.

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

The Honorable John R. Carter
Chairman, House Appropriations Subcommittee on Homeland Security

The Honorable David E. Price
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Mary L. Landrieu
Chairman, Senate Appropriations Subcommittee on Homeland Security

The Honorable Daniel Coats
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

I am happy to answer any further questions you may have. Please do not hesitate to contact me at [redacted] or the Department's Acting Chief Financial Officer, [redacted].

Sincerely,

R. J. PAPP, JR.
Admiral, U.S. Coast Guard
Commandant

Table of Contents

I. Legislative Language

This document responds to the language set forth in Explanatory Statement, Senate Report 113-77, and House Report 113-91, which accompany the *FY 2014 DHS Appropriations Act* (P.L. 113-76).

The Explanatory Statement includes the following provision:

> In cases where the explanatory statement directs the submission of a report or a briefing, such report or briefing shall be provided to the Committees not later than April 15, 2014, unless otherwise directed. Reports and briefings that are required by the House and Senate reports are due on the dates specified or, in instances where the date specified occurred prior to the date of enactment of this Act, the report or briefing shall be due not later than April 15, 2014.
> Senate Report 113-77 states:

Senate Report 113-77 states:

> COAST GUARD DEFENSE RELATED ACTIVITIES
> Since 2001, the Coast Guard has derived $340,000,000 (excluding overseas contingency operations) of its annual ''Operating Expenses'' appropriation for defense related activities. This number has remained relatively constant for more than a decade despite the Coast Guard's budget growing by 225 percent over that same period of time. Moreover, all Coast Guard appropriations play a vital role in ensuring the Service can execute its defense related missions, yet, only the ''Operating Expenses'' appropriation derives any defense related funding. The Committee is concerned that this level and allocation of funding may not adequately reflect the estimated $800,000,000 or more the Coast Guard spends annually to meet its defense related missions. The Committee directs the Coast Guard to provide an analysis of all defense related expenses within its appropriations, using the April 1998 GAO Report on U.S. Coast Guard Use of DOD Funds for National Security Functions as the basis for defining National Security Functions. The report should identify the current allocation of the $340,000,000 within the ''Operating Expenses'' appropriation, shortfalls between that amount and amounts actually spent for defense related activities, and any defense related costs being incurred by other Coast Guard appropriations. The results of the analysis are to be shared with the House and Senate Committees on Budget, the Congressional Budget Office, and the Office of Management and Budget, no later than November 1, 2013. The results shall also be reflected in the President's budget submission for fiscal year 2015.

II. Report

For more than two centuries, the Coast Guard has served the nation as one of the five Armed Forces and the principal federal agency for Maritime Safety, Security and Stewardship. Throughout its distinguished history, the Coast Guard has enjoyed a unique relationship with other components of the U.S. Military. By statute, the Coast Guard is an Armed Force, operating in the joint arena at any time and functioning as a specialized service under the Navy in time of war or when directed by the President.

Prior to 2001, Coast Guard received a transfer of funds from the Department of Defense (DoD) to be used for national security functions that support DoD. Since 2001, such transfers are no longer received. However, Congress has annually appropriated $340,000,000 for non-emergency, defense-related activities to the Coast Guard's Operating Expenses (OE) appropriation. As directed by the 2014 Consolidated Appropriations Act, this report presents the estimated allocation of the $340,000,000 appropriated to OE in 2013 (P.L. 113-76) using the categories for "operating expenses in support of national security" described in the 1998 GAO Report *U.S. Coast Guard Use of DOD Funds for National Security Function* (GAO/NSIAD-98-110) . Additionally, this report estimates the total amount, including the $340,000,000, that was expended from OE for those activities, as well as amounts expended for those activities from other appropriations. Funding provided to the Coast Guard as emergency appropriations for Overseas Contingency Operations is not included in this report.

Based on the 1998 GAO Report, the four categories used to capture USCG defense-related funding and costs are as follows:

1. *Defense Readiness* – Maintaining and exercising readiness to operate with DoD, including military training of operational units, joint exercises with DoD, liaison positions with DoD and joint operations.
2. *Domestic Support*[1] – Maintaining aids to navigation and port safety and security missions focusing on the 124 domestic waterways and 22 strategic ports designated as "militarily critical."
3. *Missions Specified in Memorandum of Agreement Annexes*[2] – Performing the missions of Maritime Interception/Interdiction Operations; Military Environmental Response; Port Operations, Security and Defense; Theater Security Cooperation; Coastal Sea Control Operations; Rotary Wing Air Intercept operations; Combating Terrorism operations; and Maritime Operational Threat Response in support.
4. *Support to Combatant Commanders* – Operating and maintaining Coast Guard assets for use under DoD plans for two regional conflicts that may occur simultaneously.

Note 1: Includes 17 Strategic Commercial Ports and 5 Strategic Military Ports identified within the National Port Readiness Network Memorandum of Understanding, Revision 6 (August 2006).
Note 2: Based on signed Memorandum of Agreement between the Departments of Defense and Homeland Security, May 2008.

These four categories, plus USCG direct support to the DoD drug interdiction mission, adequately encompass the Coast Guard's defense-related activities today.

Methodology for determining Allocations and Spending for Defense-Related Activities

The Coast Guard does not represent or execute its budget by specific missions or activities. Similarly, its financial systems are not structured to accumulate accounting data by operating programs or missions areas. The Coast Guard utilizes an employment-based Mission Cost Model as its official methodology for estimating budgetary funding and spending for each of its eleven statutory missions. For this report, the Coast Guard used information from the Mission Cost Model to estimate the funding allocation and spending for defense-related activities.

The methodology used in the Mission Cost Model is repeatable and is based on the attribution of direct support and overhead funding or actual spending that are proportionally allocated to reflect historical mission employment data.

Operating Expenses

Under OE, funding allocations (i.e., budget authority) and spending for defense-related activities are estimated as a share of the expected or actual utilization, respectively, of assets and activities based upon the reported percentage of time aircraft, cutters, and boats spent conducting defense-related activities. OE is the only Coast Guard funding source that directly supports defense-related activities.

The Coast Guard's Mission Cost Model estimates of OE funding allocations and expenditures for total defense-related activities (including drug interdiction) in Fiscal Year 2013 are $813.385 million and $774.788 million, respectively. Consistent with the 1998 GAO report, the amounts do not include military and civilian pay associated with these activities. The table below provides the breakout of these estimates by activity (as defined in the 1998 GAO report):

Defense-Related Activity	Fiscal Year 2013 Allocation (BA in millions)	Fiscal Year 2013 Expenditures (in millions)
Defense Readiness[1]	$82.085	$80.939
Domestic Support	$193.884	$178.261
Memorandum of Agreement Annexes	$132.686	$130.510
Support to Combatant Commanders	$109.476	$107.681
Subtotal	**$518.131**	**$497.391**
Drug Interdiction	$295.254	$277.397
Total	**$813.385**	**$774.788**

Note 1: For the purposes of this report, which requires USCG to use the 1998 GAO report categories, many activities that are described as "Defense Readiness" in the Coast Guard Congressional Justification are more appropriately categorized under Domestic Support, Memorandum of Agreement Annexes or Support to Combatant Commanders in the above table.

For Fiscal Year 2013, the Coast Guard's estimated allocation and expenditure of the aforementioned $340 million is estimated to be:

Defense-Related Activity	FY 2013 Allocation (BA in millions)	FY 2013 Expenditures (in millions)
Defense Readiness	$17.172	$19.008
Domestic Support[1]	$193.884	$178.261
Memorandum of Agreement Annexes	$27.757	$30.725
Support to Combatant Commanders	$22.902	$25.351
Subtotal	**$261.715**	**$253.345**
Drug Interdiction[2]	$78.285	$86.655

Total[3]	**$340.000**	**$340.000**

Note 1: This amount is equivalent to the Coast Guard's total activities categorized as Domestic Support. There are no Domestic Support expenditures beyond what it outlined in the $340 million.
Note 2: Since the 1998 GAO Report, the Coast Guard has incorporated Drug Interdiction into its estimate of Defense Related Activities.
Note 3: The approximate breakdown of the $340 million was determined by taking a weighted average of mission activities that have a defense nexus as a portion of the Coast Guard's total non-pay budget authority.

Other Appropriations

Programs funded by the Acquisition, Construction, and Improvement (AC&I) appropriation do not contribute directly to defense-related activities, but provide an indirect contribution that ensures the Coast Guard has the necessary ships, boats, aircraft and facilities for use in those activities in the future. For the purposes of this report, the Coast Guard is reporting the defense-related budget authority as AC&I estimates attributed to the Defense Readiness and Drug Interdiction missions, based on the Revised Enacted Fiscal Year 2013 Budget. For Fiscal Year 2013, the estimate is $647.865 million ($125.530 million for Defense Readiness and $522.335 million for Drug Interdiction).

Programs funded by the Reserve Training (RT) appropriation do not contribute directly to defense-related activities, but provide properly trained and equipped personnel to support those activities in the future. For the purposes of this report, the Coast Guard is reporting the defense-related budget authority as RT estimates attributed to the Defense Readiness and Drug Interdiction missions, based on the Revised Enacted Fiscal Year 2013 Budget. For Fiscal Year 2013, the estimate is $23.364 million ($8.248 million for Defense Readiness and $15.116 million for Drug Interdiction).

Programs funded by the Research, Development, Test, and Evaluation (RDT&E) appropriation do not contribute directly to defense-related activities, but provide an indirect contribution that ensures the Coast Guard receives the most effective and technologically advanced equipment available for use in those activities in the future. For the purposes of this report, the Coast Guard is reporting the defense-related budget authority as RT estimates attributed to the Defense Readiness and Drug Interdiction missions, based on the Revised Enacted Fiscal Year 2013 Budget. For Fiscal Year 2013, the estimate is $2.902 million ($0.627 million for Defense Readiness and $2.275 million for Drug Interdiction).

Conclusion

As a critical component of the U.S. National Fleet and the Joint Force, the Coast Guard will sustain a high state of readiness to support DoD defense activities and to operate as a specialized service and force provider alongside other military components in DoD.

Acquisition and Operation of Polar Icebreakers: Fulfilling the Nation's Needs

Letter Report

Division on Earth and Life Studies
and
Transportation Research Board of the
National Academies of Sciences, Engineering, and Medicine

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, nongovernmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Marcia McNutt is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. C. D. Mote, Jr., is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the National Academies of Sciences, Engineering, and Medicine to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.
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The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

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The National Academies of
SCIENCES • ENGINEERING • MEDICINE
TRANSPORTATION RESEARCH BOARD

Transportation Research Board of the
National Academies of Sciences, Engineering, and Medicine
500 Fifth Street, NW
Washington, DC 20001

July 11, 2017

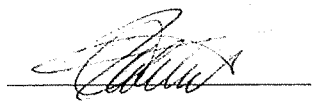
The Honorable John F. Kelly
Secretary of Homeland Security
Washington, D.C. 20528

Dear Secretary Kelly:

In the Coast Guard Authorization Act of 2015,[1] Congress required the Secretary of the Department of Homeland Security to enter into an arrangement with the National Academies of Sciences, Engineering, and Medicine (National Academies) for an assessment of alternative strategies for minimizing the costs incurred by the federal government in procuring and operating heavy polar icebreakers. In response to this requirement, the National Academies formed a committee with expertise in naval architecture, ship construction, polar science, polar ship operations, icebreakers, and maritime finance. Names of committee members and members' biographical statements are shown in Appendix F. The committee's statement of task is given in Appendix A. To fulfill its charge, the committee met four times over a 6-month period and was briefed by multiple stakeholders (see Appendix G for a summary of the committee's information-gathering activities). In view of the breadth of the statement of task and the limited time for the report's completion, the committee and congressional staff agreed that the report should focus on strategies to minimize life-cycle costs of polar icebreaker acquisition and operations. The letter report that follows was reviewed in draft form by a group of independent experts according to the policies and procedures approved by the National Academies' Report Review Committee (see Appendix H for names of the reviewers). The committee's overall findings and recommendations start on page 9, and supporting information is referenced in the appendices that follow. The committee is pleased to provide this letter report to inform the decisions that the administration and Congress must make to ensure the nation's continual access to and presence in the Earth's polar regions.

[1] See Section 604, Public Law 114–120 (Coast Guard Authorization Act of 2015), dated February 8, 2016. https://www.congress.gov/114/plaws/publ120/PLAW-114publ120.pdf.

Sincerely,



Richard West
Committee Chair

cc: Admiral Paul F. Zukunft, Commandant, U.S. Coast Guard

Contents

LETTER REPORT ON POLAR ICEBREAKER COST ASSESSMENT

INTRODUCTION

The United States has strategic national interests in the polar regions. In the Arctic, the nation must protect its citizens, natural resources, and economic interests; assure sovereignty, defense readiness, and maritime mobility; and engage in discovery and research. In the Antarctic, the United States must maintain an active presence that includes access to its research stations for the peaceful conduct of science and the ability to participate in inspections as specified in the Antarctic Treaty. The committee's charge (see Appendix A) was to advise the U.S. House of Representatives and the U.S. Senate on an assessment of the costs incurred by the federal government in carrying out polar icebreaking missions and on options that could minimize life-cycle costs. The committee's consensus findings and recommendations are presented below. Unless otherwise specified, all estimated costs and prices for the future U.S. icebreakers are expressed in 2019 dollars, since that is the year in which the contracts are scheduled to be made. Supporting material is found in the appendices.

FINDINGS AND RECOMMENDATIONS

1. Finding: The United States has insufficient assets to protect its interests, implement U.S. policy, execute its laws, and meet its obligations in the Arctic and Antarctic because it lacks adequate icebreaking capability.

For more than 30 years, studies have emphasized the need for U.S. icebreakers to maintain presence, sovereignty, leadership, and research capacity—but the nation has failed to respond (see Appendix B). The strong warming and related environmental changes occurring in both the Arctic and the Antarctic have made this failure more critical. In the Arctic, changing sea ice conditions will create greater navigation hazards for much of the year, and expanding human industrial and economic activity will magnify the need for national presence in the region. In the Antarctic, sea ice trends have varied greatly from year to year, but the annual requirements for access into McMurdo Station have not changed. The nation is ill-equipped to protect its interests and maintain leadership in these regions and has fallen behind other Arctic nations, which have mobilized to expand their access to ice-covered regions. The United States now has the opportunity to move forward and acquire the capability to fulfill these needs. Appendix B provides a broader discussion and supporting material concerning U.S. icebreaking needs and the changing polar environment, and Appendix E provides additional information about the icebreaking capability of other nations.

2. Recommendation: The United States Congress should fund the construction of four polar icebreakers of common design that would be owned and operated by the United States Coast Guard (USCG).

The current Department of Homeland Security (DHS) Mission Need Statement (DHS 2013) contemplates a combination of medium and heavy icebreakers. The committee's recommendation is for a single class of polar icebreaker with heavy icebreaking capability. Proceeding with a single class means that only one design will be needed, which will provide cost savings. The committee has found that the fourth heavy icebreaker could be built for a lower cost than the lead ship of a medium icebreaker class (see Appendix D, Table D-10).

The DHS Mission Need Statement contemplated a total fleet of "potentially" up to six ships of two classes—three heavy and three medium icebreakers. Details appear in the *High Latitude Mission Analysis Report*. The Mission Need Statement indicated that to fulfill its statutory missions, USCG required three heavy and three medium icebreakers; each vessel would have a single crew and would homeport in Seattle. The committee's analysis indicated that four heavy icebreakers will meet the statutory mission needs gap identified by DHS for the lowest cost. Three of the ships would allow continuous presence in the Arctic, and one would service the Antarctic.

As noted in the *High Latitude Report*, USCG's employment standard is 185 days away from home port (DAFHP) for a single crew. Three heavy icebreakers in the Arctic provide 555 DAFHP, sufficient for continuous presence. In addition, the medium icebreaker USCG Cutter *Healy*'s design service life runs through 2030. If greater capacity is required, USCG could consider operating three ships with four crews, which would provide 740 DAFHP. The use of multiple crews in the Arctic could require fewer ships while providing a comparable number of DAFHP. For example, two ships (instead of the recommended three) operating in the Arctic with multiple crews could provide a similar number of annual operating days at a lower cost, but such an arrangement may not permit simultaneous operations in both polar regions and may not provide adequate redundancy in capability. More important, an arrangement under which fewer boats are operated more often would require more major maintenance during shorter time in port, often at increasing cost. In addition, if further military presence is desired in the Arctic, USCG could consider ice-strengthening the ninth national security cutter.

One heavy icebreaker servicing the Antarctic provides for the McMurdo breakout and international treaty verification. The availability of the vessel could be extended by homeporting in the Southern Hemisphere. If the single vessel dedicated to the Antarctic is rendered inoperable, USCG could redirect an icebreaker from the Arctic, or it could rely on support from other nations. The committee considers both options to be viable and believes it difficult to justify a standby (fifth) vessel for the Antarctic mission when the total acquisition and lifetime operating costs of a single icebreaker are projected to exceed $1.6 billion. Once the four new icebreakers are operational, USCG can reasonably be expected to plan for more distant time horizons. USCG could assess the performance of the early ships once they are operational and determine whether additional capacity is needed.

USCG is the only agency of the U.S. government that is simultaneously a military service, a law enforcement agency, a marine safety and rescue agency, and an environmental protection agency. All of these roles are required in the mission need statement for a polar icebreaker. USCG, in contrast to a civilian company, has the authorities, mandates, and competencies to conduct the missions contemplated for the polar icebreakers. Having one agency with a multimission capability performing the range of services needed would be more efficient than potentially duplicating effort by splitting polar icebreaker operations among other agencies. The requirement for national presence is best accomplished with a military vessel. In addition, USCG is fully interoperable with the U.S. Navy and the nation's North Atlantic Treaty Organization partners. USCG is already mandated to operate the

nation's domestic and polar icebreakers. Continuing to focus this expertise in one agency remains the logical approach (see Appendix B).

Government ownership of new polar icebreakers would be less costly than the use of lease financing (see Appendix C). The government has a lower borrowing cost than any U.S.-based leasing firm or lessor. In addition, the lessor would use higher-cost equity (on which it would expect to make a profit) to cover a portion of the lease financing. The committee's analysis shows that direct purchase by the government would cost, at a minimum, 19 percent less than leasing on a net present value basis (after tax). There is also the risk of the lessor going bankrupt and compromising the availability of the polar icebreaker to USCG. For its analysis, the committee not only relied on its extensive experience with leveraged lease financing but also reviewed available Government Accountability Office reports and Office of Management and Budget rules, examined commercial leasing economics and current interest rates, and validated its analysis by consulting an outside expert on the issue (see Appendix C).

Chartering (an operating lease) is not a viable option (see Appendix C). The availability of polar icebreakers on the open market is extremely limited. (The committee is aware of the sale of only one heavy icebreaker since 2010.) U.S. experience with chartering a polar icebreaker for the McMurdo resupply mission has been problematic on two prior charter attempts. Chartering is workable only if the need is short term and mission specific. The committee notes that chartering may preclude USCG from performing its multiple missions (see Appendix B and Appendix C).

In the committee's judgment, an enlarged icebreaker fleet will provide opportunities for USCG to strengthen its icebreaking program and mission. Although the number of billets that require an expert is small compared with the overall number of billets assigned to these icebreakers, more people performing this mission will increase the pool of experienced candidates. This will provide personnel assignment officers with a larger pool of candidates when the more senior positions aboard icebreakers are designated, which will make icebreaking more attractive as a career path and increase the overall level of icebreaking expertise within USCG. Importantly, the commonality of design of the four recommended heavy icebreakers will reduce operating and maintenance costs over the service life of these vessels through efficiencies in supporting and crewing them. Having vessels of common design will likely improve continuity of service, build icebreaking competency, improve operational effectiveness, and be more cost-efficient (see also Appendix C and Appendix D).[2]

3. Recommendation: USCG should follow an acquisition strategy that includes block buy contracting with a fixed price incentive fee contract and take other measures to ensure best value for investment of public funds.

Icebreaker design and construction costs can be clearly defined, and a fixed price incentive fee construction contract is the most reliable mechanism for controlling costs for a program of this complexity. This technique is widely used by the U.S. Navy. To help ensure best long-term value, the criteria for evaluating shipyard proposals should incorporate explicitly defined life-cycle cost metrics (see Appendix D).

A block buy authority for this program will need to contain specific language for economic order quantity purchases for materials, advanced design, and construction activities. A block buy

[2] VADM F. Midgette, USCG, briefing to the committee, April 13, 2017.

contracting program[3] with economic order quantity purchases enables series construction, motivates competitive bidding, and allows for volume purchase and for the timely acquisition of material with long lead times. It would enable continuous production, give the program the maximum benefit from the learning curve, and thus reduce labor hours on subsequent vessels.

The acquisition strategy would incorporate (*a*) technology transfer from icebreaker designers and builders with recent experience, including international expertise in design, construction, and equipment manufacture; (*b*) a design that maximizes use of commercial off-the-shelf (COTS) equipment, applies Polar Codes and international standards, and only applies military specifications (MIL-SPEC) to the armament, aviation, communications, and navigation equipment; (*c*) reduction of any "buy American" provisions to allow the sourcing of the most suitable and reliable machinery available on the market; and (*d*) a program schedule that allows for completion of design and planning before the start of construction. These strategies will allow for optimization of design, reduce construction costs, and enhance reliability and maintainability (see Appendix D).

4. Finding: In developing its independent concept designs and cost estimates, the committee determined that the costs estimated by USCG for the heavy icebreaker are reasonable. However, the committee believes that the costs of medium icebreakers identified in the *High Latitude Mission Analysis Report* are significantly underestimated.

The committee estimates the rough order-of-magnitude (ROM) cost of the first heavy icebreaker to be $983 million. (See Appendix D, Table D-6.) Of these all-in costs, 75 to 80 percent are shipyard design and construction costs; the remaining 20 to 25 percent cover government-incurred costs such as government-furnished equipment and government-incurred program expenses. If advantage is taken of learning and quantity discounts available through the recommended block buy contracting acquisition strategy, the average cost per heavy icebreaker is approximately $791 million, on the basis of the acquisition of four ships. The committee's analysis of the ship size to incorporate the required components (stack-up length) suggests an overall length of 132 meters (433 feet) and a beam of 27 meters (89 feet). This is consistent with USCG concepts for the vessel.

Costs can be significantly reduced by following the committee's recommendations. Reduction of MIL-SPEC requirements can lower costs by up to $100 million per ship with no loss of mission capability (see Appendix D, Table D-12). The other recommended acquisition, design, and construction strategies will control possible cost overruns and provide significant savings in overall life-cycle costs for the program.

Although USCG has not yet developed the operational requirements document for a medium polar icebreaker, the committee was able to apply the known principal characteristics of the USCG Cutter *Healy* to estimate the scope of work and cost of a similar medium icebreaker. The committee estimates that a first-of-class medium icebreaker will cost approximately $786 million. The fourth ship of the heavy icebreaker series is estimated to cost $692 million. Designing a medium-class polar icebreaker in a second shipyard would incur the estimated engineering, design, and planning costs of $126 million and would forgo learning from the first three ships; the learning curve would be restarted with the first medium design. Costs of building the fourth heavy icebreaker would be less than the costs of designing and building a first-of-class medium icebreaker (see Appendix D, Table D-10). In developing its ROM cost estimate, the committee agreed on a common notional design and

[3] See O'Rourke and Schwartz 2017 for an overview of the advantages and limitations of block buy contracting and multiyear procurement.

basic assumptions (see Tables D-2, D-3, D-4, and D-5). Two committee members then independently developed cost estimating models, which were validated internally by other committee members. These analyses were then used to establish the committee's primary cost estimate. Uncertainties of the cost estimate are identified and discussed further in Appendix D.

5. Finding: Operating costs of new polar icebreakers are expected to be lower than those of the vessels they replace.

The committee expects the operating costs for the new heavy polar icebreakers to be lower than those of USCG's *Polar Star*. While USCG's previous experience is that operating costs of new cutters are significantly higher than those of the vessels they replace, the committee does not believe this historical experience applies in this case. There is good reason to believe that operating costs for new ships using commercially available modern technology will be lower than costs for existing ships (see Appendix D). The more efficient hull forms and modern engines will reduce fuel consumption, and a well-designed automation plant will require fewer operation and maintenance personnel, which will allow manning to be reduced or freed up for alternative tasks. The use of COTS technology and the minimization of MIL-SPEC, as recommended, will also reduce long-term maintenance costs, since use of customized equipment to meet MIL-SPEC requirements can reduce reliability and increase costs. A new vessel, especially over the first 10 years, typically has significantly reduced major repair and overhaul costs, particularly during dry-dock periods, compared with existing icebreakers—such as the *Polar Star*—that are near or at the end of their service life (see Appendix D). The *Polar Star* has many age-related issues that require it to be extensively repaired at an annual dry-docking. These issues will be avoided in the early years of a new ship. However, the committee recognizes that new ship operating costs can be higher than those of older ships if the new ship has more complexity to afford more capabilities. Therefore, any direct comparisons of operating costs of newer versus older ships would need to take into account the benefits of the additional capabilities provided by the newer ship.

USCG will have an opportunity to evaluate the manning levels of the icebreaker in light of the benefits of modern technology to identify reductions that can be made in operating costs (see Appendix C).

6. Recommendation: USCG should ensure that the common polar icebreaker design is science-ready and that one of the ships has full science capability.

All four proposed ships would be designed as "science-ready," which will be more cost-effective when one of the four ships—most likely the fourth—is made fully science capable. Including science readiness in the common polar icebreaker design is the most cost-effective way of fulfilling both the USCG's polar missions and the nation's scientific research polar icebreaker needs (see Appendix D). The incremental costs of a science-ready design for each of the four ships ($10 million to $20 million per ship) and of full science capability for one of the ships at the initial build (an additional $20 million to $30 million) are less than the independent design and build cost of a dedicated research medium icebreaker (see Appendix D, p. 103). In briefings at its first meeting, the committee learned that the National Science Foundation and other agencies do not have budgets to support full-time heavy icebreaker access or the incremental cost of design, even though their science programs may

require this capability. Given the small incremental cost, the committee believes that the science capability cited above should be included in the acquisition costs.

Science-ready design includes critical elements that cannot be retrofitted cost-effectively into an existing ship and that should be incorporated in the initial design and build. Among these elements are structural supports, appropriate interior and exterior spaces, flexible accommodation spaces that can embark up to 50 science personnel, a hull design that accommodates multiple transducers and minimizes bubble sweep while optimizing icebreaking capability, machinery arrangements and noise dampening to mitigate interference with sonar transducers, and weight and stability latitudes to allow installation of scientific equipment. Such a design will enable any of the ships to be retrofitted for full science capability in the future, if necessary (see Appendix D, p. 103).

Within the time frame of the recommended build sequence, the United States will require a science-capable polar icebreaker to replace the science capabilities of the *Healy* upon her retirement. To fulfill this need, one of the heavy polar icebreakers would be procured at the initial build with *full* science capability; the ability to fulfill other USCG missions would be retained. The ship would be outfitted with oceanographic overboarding equipment and instrumentation and facilities comparable with those of modern oceanographic research vessels. Some basic scientific capability, such as hydrographic mapping sonar, should be acquired at the time of the build of each ship so that environmental data that are essential in fulfilling USCG polar missions can be collected.

7. Finding: The nation is at risk of losing its heavy polar icebreaking capability—experiencing a critical capacity gap—as the *Polar Star* approaches the end of its extended service life, currently estimated at 3 to 7 years.

The *Polar Star*, built in 1976, is well past its 30-year design life. Its reliability will continue to decline, and its maintenance costs will continue to escalate. Although the ship went through an extensive life-extending refit in 2011–2012, the *Polar Star*'s useful life is estimated to end between 2020 and 2024. As USCG has recognized, the evaluation of alternative arrangements to secure polar icebreaking capacity is important, given the growing risks of the *Polar Star* losing its capability to fulfill its mission (see Appendix B).

8. Recommendation: USCG should keep the *Polar Star* operational by implementing an enhanced maintenance program (EMP) until at least two new polar icebreakers are commissioned.

Even if the committee's notional schedule for new polar icebreakers is met, the second polar icebreaker would not be ready until July 2025 (see Appendix D, Figure D-2). The committee's proposed EMP could be designed with planned—and targeted—upgrades that allow the *Polar Star* to operate every year for its Antarctic mission. The necessary repairs could be performed in conjunction with the ship's current yearly dry-docking schedule within existing annual expenditures, estimated to average $5 million. In particular, the EMP would require improvements in the ship's operating systems, sanitary system, evaporators, main propulsion systems, and controllable pitch propellers. In the committee's judgment, the EMP could be accomplished within USCG's average annual repair expenditures for the *Polar Star*, which currently range between $2 million and $9 million (see Appendix B).

References

Abbreviation

DHS Department of Homeland Security

DHS. 2013. *Polar Icebreaker Recapitalization Project Mission Need Statement Version 1.0.* Washington, D.C.

O'Rourke, R., and M. Schwartz. 2017. *Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress*. Congressional Research Service, Washington, D.C., June 2. https://fas.org/sgp/crs/natsec/R41909.pdf.

Committee on Polar Icebreaker Cost Assessment: Members and Biographical Information

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Committee on Polar Icebreaker Cost Assessment:

Statement of Task

SEC. 604. NATIONAL ACADEMY OF SCIENCES COST ASSESSMENT.

(a) Cost Assessment.—The Secretary of the department in which the Coast Guard is operating shall seek to enter into an arrangement with the National Academy of Sciences under which the Academy, by no later than 365 days after the date of the enactment of this Act, shall submit to the Committee on Transportation and Infrastructure and the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate an assessment of the costs incurred by the Federal Government to carry out polar icebreaking missions.

An ad hoc committee shall:

(1) describe current and emerging requirements for the Coast Guard's polar icebreaking capabilities, taking into account the rapidly changing ice cover in the Arctic environment, national security considerations, and expanding commercial activities in the Arctic and Antarctic, including marine transportation, energy development, fishing, and tourism;

(2) identify potential design, procurement, leasing, service contracts, crewing, and technology options that could minimize life-cycle costs and optimize efficiency and reliability of Coast Guard polar icebreaker operations in the Arctic and Antarctic; and

(3) examine:

(A) Coast Guard estimates of the procurement and operating costs of a Polar icebreaker capable of carrying out Coast Guard maritime safety, national security, and stewardship responsibilities including:

(i) economies of scale that might be achieved for construction of multiple vessels; and

(ii) costs of renovating existing polar class icebreakers to operate for a period of no less than 10 years.

(B) the incremental cost to augment the design of such an icebreaker for multiuse capabilities for scientific missions;

(C) the potential to offset such incremental cost through cost-sharing agreements with other Federal departments and agencies; and

(D) United States polar icebreaking capability in comparison with that of other Arctic nations, and with nations that conduct research and other activities in the Arctic.

(b) Included Costs: For purposes of subsection (a), the assessment shall include costs incurred by the Federal Government for:

(1) the lease or operation and maintenance of the vessel or vessels concerned;

(2) disposal of such vessels at the end of the useful life of the vessels;

(3) retirement and other benefits for Federal employees who operate such vessels; and

(4) interest payments assumed to be incurred for Federal capital expenditures.

(c) Assumptions: For purposes of comparing the costs of such alternatives, the Academy shall assume that:

(1) each vessel under consideration is

(A) capable of breaking out McMurdo Station and conducting Coast Guard missions in the Antarctic, and in the United States territory in the Arctic (as that term is defined in section 112 of the Arctic Research and Policy Act of 1984 (15 U.S.C. 4111)); and

(B) operated for a period of 30 years;

(2) the acquisition of services and the operation of each vessel begins on the same date; and

(3) the periods for conducting Coast Guard missions in the Arctic are of equal lengths.

(d) Use of Information.—In formulating cost pursuant to subsection (a), the National Academy of Sciences may utilize information from other Coast Guard reports, assessments, or analyses regarding existing Coast Guard Polar class icebreakers or for the acquisition of a polar icebreaker for the Federal Government.

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