OFFICE OF INSPECTOR GENERAL

# U.S. Coast Guard Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance Modernization

Homeland Security

October 28, 2014
OIG-15-05

# HIGHLIGHTS

## *U.S. Coast Guard Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance Modernization*

**October 28, 2014**

## Why We Did This

The Coast Guard has undertaken a project to modernize information technology onboard certain ships and aircraft. This technology is referred to collectively as Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems. The C4ISR project is a major information technology investment with an acquisition life cycle cost of $1.5 billion through fiscal year 2026.

## What We Recommend

We made three recommendations to improve information technology systems onboard certain ships and aircraft and to improve plans to manage these systems effectively.

**For Further Information:**
Contact our Office of Public Affairs at (202) 254-4100, or email us at DHS-OIG.OfficePublicAffairs@oig.dhs.gov

## What We Found

The Coast Guard has implemented information technology systems that effectively support the mission needs of some ships and aircraft. Specifically, the systems have met overall performance requirements and have improved operational capabilities, including increased situational awareness, better communication within the Coast Guard and with its partners, and enhanced sensor capabilities. The Coast Guard, however, has not carried out some planned system enhancements that were necessary to support mission needs of certain aircraft and legacy ships. These enhancements were not carried out because of significant budget reductions. Revised plans do not fully address how the Coast Guard will meet the critical technology needs of these aircraft and legacy ships. As a result, these ships and aircraft continue to rely on obsolete technology which impacts mission performance and makes operations and maintenance more difficult and costly.

The Coast Guard has planned effectively for future technology capabilities. In particular, the Coast Guard has revised its plans to meet system needs onboard the future Offshore Patrol Cutter, which is the last major ship planned as part of fleet modernization. As a result, the new systems should support the Offshore Patrol Cutter's critical mission need, although these systems will be less capable in some areas than originally planned. The Coast Guard, however, did not have plans in place to migrate to a common system baseline for the ships and aircraft included in the modernization project, or to ensure effective support for multiple systems. As a result, the Coast Guard may experience higher life cycle costs and reduced mission effectiveness in the future.

## Coast Guard Response

The Coast Guard concurred with our recommendations.

# Table of Contents



# Appendixes



# Abbreviations

| | |
|---|---|
| C4ISR | Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance |
| CGC2 | Coast Guard Command and Control |
| DHS | Department of Homeland Security |
| FY | fiscal year |
| GAO | Government Accountability Office |
| IT | information technology |
| OIG | Office of Inspector General |

## Executive Summary

The United States Coast Guard has undertaken a project to modernize information technology systems that support operational needs onboard certain ships and aircraft. This technology is referred to collectively as Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance systems. We conducted an audit to determine how effectively these systems are supporting Coast Guard mission needs, including the extent to which delivered capabilities have met the needs of certain ships and aircraft, and the effectiveness of planning for future technology capabilities.

The Coast Guard has implemented information technology systems that effectively support the mission needs of some ships and aircraft. Specifically, the systems have met overall performance requirements and have improved operational capabilities, including increased situational awareness, better communication within the Coast Guard and with its partners, and enhanced sensor capabilities. The Coast Guard, however, has not carried out some planned system enhancements that were necessary to support mission needs of certain aircraft and legacy ships. These enhancements were not carried out because of significant budget reductions. Revised plans do not fully address how the Coast Guard will meet the critical technology needs of these aircraft and legacy ships. As a result, these ships and aircraft continue to rely on obsolete technology which impacts mission performance and makes operations and maintenance more difficult and costly.

The Coast Guard has planned effectively for future technology capabilities. In particular, the Coast Guard has revised its plans to meet system needs onboard the future Offshore Patrol Cutter, which is the last major ship planned as part of fleet modernization. As a result, the new systems should support the Offshore Patrol Cutter's critical mission need, although these systems will be less capable in some areas than originally planned. The Coast Guard, however, did not have plans in place to migrate to a common system baseline for the ships and aircraft included in the modernization project, or to ensure effective support for multiple systems. As a result, the Coast Guard may experience higher life cycle costs and reduced mission effectiveness in the future.

We made three recommendations to the Coast Guard Deputy Commandant for Mission Support to define and implement a plan to provide legacy ships with sufficient system capabilities to carry out their mission while replacement ships are being built; to complete the implementation of an upgrade for aircraft mission systems; and to define and implement a strategy enabling the Coast Guard to efficiently manage multiple technology systems across affected aircraft and ships.

## Background

The United States Coast Guard, one of the Nation's five armed services, is a maritime military service within the Department of Homeland Security (DHS). The Coast Guard has 11 missions: Ports, Waterways, and Coastal Security; Drug Interdiction; Aids to Navigation; Search and Rescue; Living Marine Resources; Marine Safety; Defense Readiness; Migrant Interdiction; Marine Environmental Protection; Ice Operations; and Other Law Enforcement.[1] Figure 1 displays the Coast Guard's 11 missions, which correspond to its three primary roles of maritime safety, security, and stewardship.

**Figure 1. Coast Guard's 3 Roles and 11 Missions**


*Source:* Coast Guard

In the mid-1990s, the Coast Guard began planning to modernize aging elements of its fleet including obsolete technology. Rather than replacing classes of ships or aircraft through a series of individual acquisitions, the Coast Guard integrated all modernization plans into a single large acquisition commonly referred to as "Deepwater." Deepwater was intended to replace the Coast Guard's entire fleet of ships and aircraft capable of sustaining operations 50 miles offshore. In June 2002, the Coast Guard awarded the Deepwater contract to a joint venture between Lockheed Martin Corporation and Northrop Grumman Corporation called Integrated Coast Guard Systems. The Deepwater acquisition—the largest acquisition in Coast Guard history—was expected to take up to 25 years to complete, with an estimated cost of $24 billion.

[1] 6 U.S.C. 468(a).

The Coast Guard's Deepwater acquisition approach, however, was not successful. In 2007, the Coast Guard began transitioning away from Deepwater after acknowledging that it had relied too heavily on contractors and had failed to control costs. The Coast Guard completed the Integrated Coast Guard Systems contract in January 2011, and ceased using the term "Deepwater" to refer to its fleet recapitalization effort. The Coast Guard's planning now includes distinct acquisition projects to build or modernize five classes each of ships and aircraft, and procurement of other Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities.

C4ISR is a general, overarching term used to describe the technology that the Coast Guard is implementing to support operational needs onboard certain cutters and aircraft.[2] C4ISR technology provides the situational awareness, data processing, and information exchange tools necessary to perform the Coast Guard's missions. A central component of C4ISR is to provide a common operating picture to integrate aircraft, ship, and command center data, including radar, navigation, communication, and intelligence systems information to facilitate decision making. Figure 2 illustrates how C4ISR is intended to provide a common operating picture and facilitate information sharing among Coast Guard assets.

**Figure 2. C4ISR and the Common Operating Picture**

*Source:* Coast Guard

[2] A cutter is any Coast Guard vessel at least 65 feet in length, and a boat is any vessel under 65 feet in length.

C4ISR Project

The C4ISR Project is a major information technology (IT) investment with an acquisition life cycle cost of over $1.5 billion through fiscal year (FY) 2026.[3] For the first 11 years, from 2002 through 2013, the C4ISR Project received approximately $730 million in funding. The annual budget for the project has averaged approximately $37 million each year from FY 2010 through FY 2013. The project is responsible for supporting C4ISR development and capability for 91 new cutters and 45 new aircraft, as well as upgrades to 39 aging legacy cutters.[4] The specific types of cutters and aircraft are listed below.

- National Security Cutter - The largest and most technologically advanced of the Coast Guard's newest classes of cutters, the National Security Cutter is replacing the 378-foot High Endurance Cutter. The first National Security Cutter was delivered in 2008. There are eight National Security Cutters planned, with three already in operation and a fourth scheduled for delivery in September 2014.
- Offshore Patrol Cutter – This cutter is in development and not yet operational within the Coast Guard fleet. The Offshore Patrol Cutter will replace the 210-foot and 270-foot Medium Endurance Cutters. There are 25 Offshore Patrol Cutters planned, with the delivery of the initial cutter planned for 2021.
- Fast Response Cutter – This cutter is replacing the Coast Guard's 110-foot patrol boats. The first Fast Response Cutter was delivered in 2012. There are 58 Fast Response Cutters planned, with 8 cutters in operation as of March 2014.
- Legacy Cutters – The Coast Guard continues to rely on six 378-foot High Endurance Cutters until they are replaced by National Security Cutters. The Coast Guard also relies on 13 270-foot and 14 210-foot Medium Endurance Cutters until they are replaced by the Offshore Patrol Cutter.
- HC-130J Long Range Surveillance Aircraft – This aircraft is an upgrade from the legacy C-130s employed by the Coast Guard since 1959. The first of these aircraft was delivered in 2003. There are nine HC-130J aircraft planned with six in operation as of March 2014.
- HC-144A Medium Range Surveillance Aircraft – This aircraft is replacing the fleet of Guardian HU-25 jets. The first HC-144A aircraft was delivered in 2006. There

[3] DHS AD 102-01, Interim Version 2.0, *Acquisition Directive*, Instruction Appendix B, September 21, 2010, classifies acquisitions into three levels that determine the extent and scope of required project and program management. The highest level of oversight, Level 1 major acquisition, is defined as having a Life Cycle Cost at or above $1 billion.

[4] The Coast Guard uses the term "legacy" to refer to ships, aircraft, or other equipment that are still used although they are no longer the most modern or advanced.

are currently 17 of these aircraft in operation. The Coast Guard had planned for 36 of these aircraft. However, in January 2014, the Department of Defense transferred 14 C-27J aircraft from the U.S. Air Force, which will impact the Coast Guard's plans for the total number of HC-144A aircraft that will be delivered. Figure 3 shows the cutters and aircraft included in the C4ISR Project.

**Figure 3. Cutters and Aircraft Included in the C4ISR Project**


*Source:* Coast Guard

C4ISR Development

The Coast Guard initially envisioned developing C4ISR in phases, called segments, to integrate new capabilities as fleet replacement was completed over the course of several decades. Each segment was intended to build upon the previous segment to replace obsolete technology and bring new capability to the fleet at a faster rate.

The Coast Guard initially planned for eight segments of development. The Coast Guard completed Segment 1 in 2008, which provided the Coast Guard Command and Control (CGC2) system. The Coast Guard has also begun Segment 2 upgrades. The Coast Guard has installed Segment 2 of the CGC2 system on one National Security Cutter. It also plans to upgrade the other three completed National Security Cutters and install Segment 2 on new National Security Cutters during construction. In addition, the Coast Guard has begun Segment 5 to provide upgrades to legacy cutters and shore facilities.[5]

[5] Segment 5 is nonsequential because it was intended to be done in parallel with other segments of development.

The Coast Guard has deferred Segments 3 and 4 and canceled Segments 6 through 8. Table 1 describes the eight segments of C4ISR development and the status of each segment.

**Table 1. C4ISR Segments**

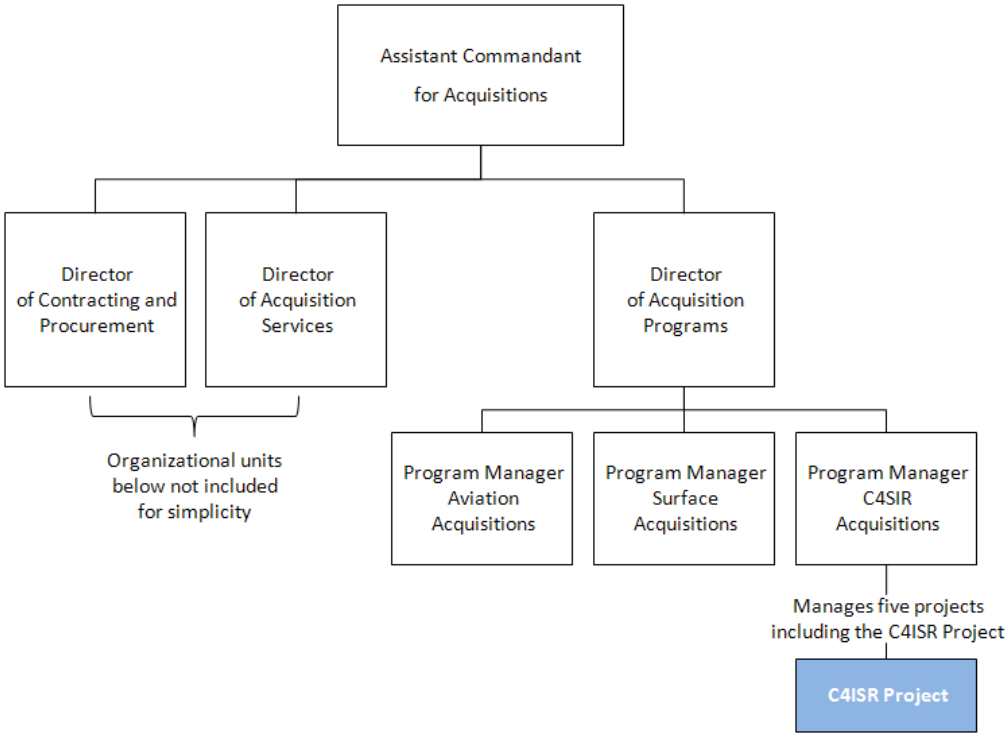
| C4ISR Segments | | |
|---|---|---|
| Segment | Description | Status |
| 1 | Provided the first C4ISR system for the National Security Cutter, HC-130J aircraft, and HC-144A aircraft. This was a proprietary system developed under the Deepwater acquisition approach. | Completed |
| 2 | Updated Segment 1 and began the transition away from a contractor-owned system toward an open, non-proprietary approach. | Ongoing |
| 3 | Intended to migrate cutters and aircraft to a common system and complete the transition away from contractor-owned software toward a non-proprietary architecture to ensure supportability and interoperability with both Department of Defense and DHS partners. | Deferred |
| 4 | Intended to update obsolete technology and incorporate enhanced cyber capabilities and security. | Deferred |
| 5 | Intended to address equipment and capability shortfalls for cutters and shore facilities that use and maintain aging and obsolete technology. | Ongoing |
| 6 | Placeholder to address emerging cyber-security requirements and technology advancements. | Canceled |
| 7 | Placeholder to address emerging cyber-security requirements and technology advancements. | Canceled |
| 8 | Placeholder to address emerging cyber-security requirements and technology advancements. | Canceled |

*Source:* Coast Guard

C4ISR Project Management

The Coast Guard's Acquisition Directorate, led by the Assistant Commandant for Acquisitions, is responsible for the Coast Guard's C4ISR modernization effort. The C4ISR Project is one of five projects under the Program Manager for C4ISR Acquisitions. The Program Manager for C4ISR Acquisitions reports to the Director of Acquisition Programs, which is one of the three main divisions within the Acquisition Directorate. Figure 4 identifies the offices within the Acquisition Directorate, including the offices relevant to the C4ISR Project.

**Figure 4. The C4ISR Project within the Acquisition Directorate's Organizational Structure**




*Source:* Coast Guard

Prior Reports

In August 2006, we reported that the Coast Guard's efforts to develop C4ISR systems could be improved with regard to increased contractor oversight, requirements management, system security, and testing.[6] In addition, in July 2011, the Government Accountability Office (GAO) reported that the Coast Guard was managing the C4ISR Project without key acquisition documents, including an up-to-date acquisition plan, a credible life cycle cost estimate, and a requirements document for the entire project.[7] GAO also found that the Coast Guard did not have adequate plans to develop a common C4ISR system across ships and aircraft.

[6] OIG-06-55, *Improvements Needed in the U. S. Coast Guard's Acquisition and Implementation of Deepwater Information Technology Systems*, August 2006.
[7] GAO-11-743, *Action Needed As Approved Deepwater Program Remains Unachievable*, July 2011.

# Results of Audit

## Progress Implementing C4ISR Capabilities

The Coast Guard has implemented C4ISR capabilities that support the mission needs of some cutters and aircraft. C4ISR capabilities have met overall performance requirements on new cutters and aircraft that have undergone formal operational testing. Further, C4ISR has provided some cutters and aircraft with improved operational capabilities, including increased situational awareness, better communication within the Coast Guard and with its partners, and enhanced sensor capabilities. The implementation of some C4ISR segments was successful because the Coast Guard strengthened acquisition and project management, increased oversight of contracts, provided training, and established an effective process to address feedback on the new C4ISR technology. The delivered C4ISR capabilities enable the Coast Guard to perform its overall mission more effectively and with a greater level of safety for Coast Guard personnel.

The Coast Guard, however, has not carried out some planned C4ISR enhancements to certain legacy cutters and aircraft necessary to continue to support mission needs effectively. Specifically, the Coast Guard reduced the scope of planned upgrades to aging technology on legacy cutters. In addition, the Coast Guard did not carry out a planned major upgrade to aircraft C4ISR mission systems. The Coast Guard did not carry out these enhancements because of significant budget reductions. Revised plans do not fully address how it will meet the critical needs of these legacy cutters and aircraft. As a result, Coast Guard personnel aboard these cutters and aircraft continue to rely on obsolete technology that negatively affects mission performance and makes operations and maintenance more difficult and costly.

## Delivered C4ISR Capabilities Support Mission Needs

Under the *Paperwork Reduction Act of 1995*, as amended, and the *Clinger-Cohen Act of 1996*, agencies are required to acquire, manage, and use IT to improve mission performance.[8] In addition, the Coast Guard's *Major Systems Acquisition Manual* requires the Coast Guard Acquisition Directorate to acquire and deliver systems that support Coast Guard forces in executing missions effectively and efficiently.

[8] *Paperwork Reduction Act of 1995*, as amended, Public Law 104-13, May 22,1995; *Information Technology Management Reform Act of 1996*, Public Law No. 104-106, Division E, February 10, 1996, renamed the *Clinger-Cohen Act of 1996,*Public Law 104-208, Section 808, September 30, 1996.

The Coast Guard has implemented C4ISR that supports the mission needs of certain cutters and aircraft. C4ISR capabilities have met overall performance requirements on new cutters and aircraft that have undergone formal operational testing.

According to the Coast Guard's *Major Systems Acquisition Manual*, major acquisitions must undergo an initial operational test and evaluation to fully demonstrate system capabilities before being deployed. The Coast Guard completed its operational test and evaluation of the Fast Response Cutter in July 2013 and the HC-144A aircraft in July 2012. As part of the testing process, the Coast Guard evaluated whether the C4ISR technology on these cutters and aircraft met operational requirements. For example, testing evaluated whether requirements for transmitting and receiving classified information, sharing sensor data with the common operating picture, and hardware and software reliability were met. While there were some individual C4ISR performance requirements that were a challenge, the test reports indicated that, overall, C4ISR systems satisfied operational requirements.

The operational test and evaluation of the National Security Cutter, including Segment 1 of the CGC2 system, is scheduled to be completed by the end of FY 2014. The Coast Guard considers the successful results of testing on the HC-144A aircraft as validation of C4ISR onboard the HC-130J aircraft because these two aircraft share a common C4ISR mission system.

In addition to meeting overall testing requirements, the Coast Guard has achieved other improved operational capabilities onboard certain cutters and aircraft through the implementation of C4ISR. Specifically, C4ISR has improved situational awareness, communications, and sensor capabilities.

Situational Awareness

C4ISR has improved situational awareness through systems that provide a common operating picture. For example, the Coast Guard implemented the SeaWatch command and control system onboard the Fast Response Cutter and its legacy High Endurance Cutters. The Coast Guard is also in the process of upgrading its legacy Medium Endurance Cutters with SeaWatch. SeaWatch integrates sensors, communications, and optical surveillance systems and allows the cutter to share classified and sensitive but unclassified information in near real time with supporting operational units and command centers. Coast Guard personnel said that the fusion of various information sources into one system helps them to complete their mission since they no longer have to move back

and forth among multiple stations during operations. Coast Guard personnel also said that the ability to track other Coast Guard and partner agency ships and aircraft within an area of operation greatly improved mission effectiveness.

Similarly, the Coast Guard has implemented the CGC2 system, which provides operators with a common operating picture, onboard the National Security Cutters. Coast Guard personnel use the common operating picture to track vessels beyond the coverage provided by the ship's own sensors. Operators aboard one National Security Cutter said that the common operating picture had helped them to intercept vessels for surveillance and boarding.

The National Security Cutter also has the ability to link together its common operating picture with U.S. Navy ships and aircraft using a system called Link 11. A National Security Cutter traveling with naval vessels could use Link 11 to see the position, course, and speed of any ship or aircraft detected by the Navy. The Link 11 capability is currently functional on one National Security Cutter with the upgrades implemented during Segment 2. The Coast Guard plans to implement this capability for all National Security Cutters.

Communications

C4ISR has provided improved communication capabilities within the Coast Guard and with partner agencies. For example, C4ISR expanded access to the Department of Defense's Secret-level classified network. Access to this network has improved communication between Coast Guard cutters, aircraft, and shore facilities, and can be used to communicate with partner agencies that use classified networks. Coast Guard personnel said that the chat tool available on this network was beneficial when compared with using radios which can be distorted and difficult to hear and understand. Coast Guard personnel working with both the Fast Response Cutter and the HC-144A aircraft said that when using the chat tool, they were able to receive information from Coast Guard shore facilities faster and they were provided with more specific intelligence to assist with operations.

In addition, the National Security Cutter has a Sensitive Compartmented Information Facility that allows onboard personnel to share intelligence at the highest security level. This capability provides for secure communication between at-sea military and law enforcement units, and enables National Security Cutters to receive and share real-time operational information and intelligence with shore-based Coast Guard command centers. It also provides redundant communications capability if primary external communications systems malfunction. For example, during a training exercise a National Security

Cutter had a communications system failure that prevented it from communicating with aircraft participating in the exercise. Coast Guard personnel were able to use the Sensitive Compartmented Information Facility to reestablish communication and successfully complete the exercise.

C4ISR upgrades have also improved radio communications. Specifically, the Keyswitch Integrated Terminal Equipment radio system on Fast Response Cutters and National Security Cutters allows operators to connect to any radio onboard the ship and communicate using multiple radio frequencies through a single platform. This reduces delays when communicating with other Coast Guard entities and between personnel. For example, when a Coast Guard operator is using this radio system to communicate with both a helicopter and a boarding team, the operator no longer has to switch manually between different radio frequencies, which can delay communications.

Sensor Capabilities

C4ISR has provided enhanced sensor capability. For example, the National Security Cutter has advanced radar systems that can detect aircraft far beyond line-of-sight in ideal conditions by transmitting a radar signal that follows the curvature of the earth. This cutter also has a sensor that can detect the radar transmissions of other ships and aircraft at ranges beyond that of its advanced radar system in ideal conditions. These enhanced detection capabilities help to maximize the time available for decision makers to respond to a threat in a national defense scenario.

The National Security Cutter also has advanced sensors that support its weapons systems. Although weapons systems onboard legacy cutters integrate navigation information, the more modern weapons system radar and optical sight system onboard the National Security Cutter can track targets far beyond the capabilities of other cutters. Further, the National Security Cutter's weapons systems are integrated with the ship's other sensors through a central processing system, allowing information such as the ship's course, speed, movement on the water, and wind direction to be used to ensure accuracy. The weapons systems also have cameras and optical sights, which provide operators with visual target confirmation. They also have the ability to record video, enabling operators to analyze shot placement and target damage.

C4ISR has also provided enhanced radar systems on the HC-130J and HC-144A aircraft. HC-130J aircraft operators highlighted this plane's radar as an excellent and highly reliable system. Likewise, operators of the HC-144A aircraft said that they are now able to find small boats and rafts 16 to 30 miles away in good

conditions. This capability improves search and rescue operations by allowing personnel aboard the aircraft to search a larger area with a higher probability of detecting smaller signals.

Strengthened Acquisition and Project Management

Delivered C4ISR technology has effectively supported Coast Guard mission needs in part because the Coast Guard has strengthened acquisition and project management capabilities since the conclusion of Deepwater. After assuming the role of lead systems integrator for Deepwater, the Coast Guard reduced costs through open competition, flexibility, and leveraging existing Coast Guard systems such as SeaWatch. The transition from contractor-owned systems, such as Segment 1 of the CGC2 system, to open competition and the use of government-owned systems allowed the Coast Guard to deliver C4ISR equipment to operational units more efficiently.

The Coast Guard has also increased oversight of private contractors working on C4ISR technology, resulting in improved compliance. Specifically, since 2007, the Coast Guard has increased oversight of C4ISR contractor Lockheed Martin at its offices located in Moorestown, New Jersey. As of November 2013, the Coast Guard had approximately 35 personnel working at the Moorestown facility conducting project oversight, software reviews, and independent verification of contractor results. Coast Guard personnel said that they retest C4ISR technology produced at the Lockheed Martin facility in a Coast Guard laboratory, and they are embedded with their technicians to increase oversight. Additionally, the Coast Guard and Lockheed Martin have implemented a process for conducting separate information assurance tests and for resolving any discrepancies between the test results. Similarly, a Coast Guard official said the Coast Guard has used Navy certification boards to assist in safety reviews, which has improved software system safety.

In addition to improving management and oversight, the Coast Guard has provided effective C4ISR training. Specifically, the Coast Guard designated its training center in Petaluma, California, as the C4ISR training center in 2004, and it began offering courses in 2007. The Petaluma training center provides both operational and technical assistance training, including the use of a fully interactive National Security Cutter simulator with a complete replica of the cutter's bridge. In addition, the training center has a temporary Fast Response Cutter replica bridge simulator, which will be replaced with a new structure designated for Fast Response Cutter and Offshore Patrol Cutter training. One Coast Guard official serving on a National Security Cutter called C4ISR training "fantastic," and another Coast Guard official said he was prepared on his first

patrol aboard a Fast Response Cutter due to the training he had received. Additionally, personnel working with the HC-144A aircraft praised the Coast Guard's C4ISR operations training and said it allowed flight crews to better prepare for operations.

The C4ISR project management team has also been responsive to user feedback. Specifically, the project management team has created processes for submitting feedback on delivered C4ISR technology, which have reduced the time required to resolve issues. For example, the Coast Guard provides a 24/7 customer service desk for system support that directs calls to the appropriate contact. In addition, the Coast Guard maintains a system trouble report and system improvement request process, which logs and tracks C4ISR system problems and requested improvements in a database for inclusion in future software updates. Any requests made by Coast Guard personnel for improved C4ISR technology are reviewed by the Coast Guard's Capabilities and Requirements Oversight Panel.

Project personnel also hold frequent teleconferences with personnel working on the Fast Response Cutter to discuss the delivered C4ISR technology, possible upgrades, and repairs. Coast Guard personnel working on Fast Response Cutters said that the project feedback and problem-solving process was excellent. According to Fast Response Cutter personnel, it would take years for an issue on a legacy cutter to receive attention, but issues on the Fast Response Cutter are reviewed immediately. Further, personnel working with the HC-144A aircraft said that the project management team listens to feedback and is very receptive.

Improved Overall Mission Effectiveness

As a result of delivered C4ISR capabilities, the Coast Guard is able to perform its missions more effectively and with a greater level of safety for Coast Guard personnel. For example, C4ISR systems enabled one National Security Cutter to assist with counter-drug and intelligence missions while in transit through an area of operations. In one case, personnel aboard the National Security Cutter were able to communicate and coordinate with multiple partner agencies such as the Department of Defense and U.S. Customs and Border Protection, as well as Coast Guard shore command centers and deployed aircraft, to detect and intercept a target of interest related to counter-drug operations. In another case, personnel aboard the National Security Cutter used C4ISR capabilities to receive notification of a nearby target of interest, photograph the vessel, and send the pictures to the shore-based intelligence command. Similarly, the Fast Response Cutter has used C4ISR capabilities to improve execution of the Coast Guard's law enforcement mission. For example, personnel aboard the Fast Response Cutter

were able to communicate with foreign partners to obtain authority to enter foreign waters to pursue and intercept a suspicious vessel.

The Coast Guard has also seen a quantifiable increase in effectiveness in certain mission areas since C4ISR capabilities have been implemented. For example, one air station accounted for more illegal narcotics being interdicted by the HC-144A aircraft in FY 2013 than its predecessor aircraft had interdicted over 14 years, from FY 1997 through FY 2011. Personnel attributed the increased operational effectiveness of the HC-144A aircraft in part to the improved C4ISR onboard the aircraft. Specifically, tools like the classified chat capability allowed operators to concentrate less on passing and receiving tactical information and focus more attention on operating the sensors that assisted with identifying potential drug interdictions.

In addition to enhancing mission effectiveness, C4ISR upgrades have increased the safety of Coast Guard personnel involved in critical operations. Specifically, the ability of National Security Cutter cameras to view vessels when it is dark has enhanced the safety of Coast Guard personnel boarding ships at night. Coast Guard personnel said that this provides boarding teams with an extra level of surveillance, including the physical condition of and crew movement on the vessel being boarded. Personnel said the ability to see what is occurring on ships being boarded at night reduces risk and increases safety.

**Certain C4ISR Enhancements Not Carried Out**

The Coast Guard has not carried out some planned C4ISR enhancements to certain aircraft and legacy cutters needed to continue to support mission needs effectively. The Coast Guard's aging fleet of legacy cutters faces significant challenges to continue to operate effectively using obsolete technology. The Coast Guard's High Endurance Cutters and its 270-foot and 210-foot Medium Endurance Cutters have already been in service ranging from two to five decades. The High Endurance Cutters and the 210-foot Medium Endurance Cutters were commissioned in the 1960s and early 1970s, and the 270-foot Medium Endurance Cutters were commissioned in the 1980s and early 1990s. Replacement of these legacy cutters is scheduled to take several decades. Table 2 shows the Coast Guard's planned replacement schedule for these legacy cutters, with the High Endurance Cutter in service until 2022, the 210-foot Medium Endurance Cutter in service until 2031, and 10 270-foot Medium Endurance Cutters still in service in 2034.

**Table 2. Legacy Cutters Remaining in Service**

| Number of Legacy Cutters Remaining In Service Each Year | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
| High Endurance Cutter (378-foot) | 6 | 5 | 4 | 3 | 3 | 3 | 2 | 1 | | | | | | | | | | | | | |
| Medium Endurance Cutter (210-foot) | 14 | | | | | | | | 13 | 12 | 11 | 9 | 7 | 5 | 3 | 2 | 1 | | | | |
| Medium Endurance Cutter (270-foot) | 13 | | | | | | | | | | | | | | | | | | 12 | 11 | 10 |

*Source:* Coast Guard

To keep these legacy cutters operationally effective until they are replaced by new cutters, the Coast Guard had planned to address challenges with obsolete technology as part of Segment 5 of C4ISR. The Coast Guard has completed, or is in the process of completing, certain C4ISR Segment 5 upgrades. For example, the Coast Guard has upgraded the command and control system onboard the High Endurance Cutters from the Shipboard Command and Control System, an outdated system that is increasingly difficult to support and maintain, to the SeaWatch system. The Coast Guard has also started installing SeaWatch onboard its Medium Endurance Cutters. In addition, the Coast Guard is upgrading legacy cutters with next-generation commercial satellite communication to improve network connectivity when deployed remotely.

The Coast Guard, however, has not carried out certain enhancements to legacy cutters that were initially part of C4ISR Segment 5 plans. For example, Segment 5 included plans to modernize the surface search radar system, which is used for navigation, surveillance, and situational awareness.[9] Coast Guard personnel said that the existing radar contains technology that is nearly 20 years old and was in need of replacement 10 years ago. The C4ISR Project canceled plans to replace this radar as part of Segment 5. Further, project plans do not include any further Segment 5 work beyond what is currently in the process of being completed.

The C4ISR mission systems onboard the HC-144A aircraft and the HC-130J aircraft also face challenges with obsolete technology. The C4ISR mission systems used on these aircraft share a common video and mission processor that was based on 1990s technology. These mission systems integrate data from cameras and other sensors with the aircraft's command and control systems to support advanced surveillance, identification, classification, and interception of targets, and enhance effective mission execution. Coast Guard officials said that

[9] This radar is the AN/SPS-73 Surface Search Radar, which is designed for both large and small cutter applications to provide operators with an advanced navigational and surveillance system that enhances situational awareness of the maritime environment.

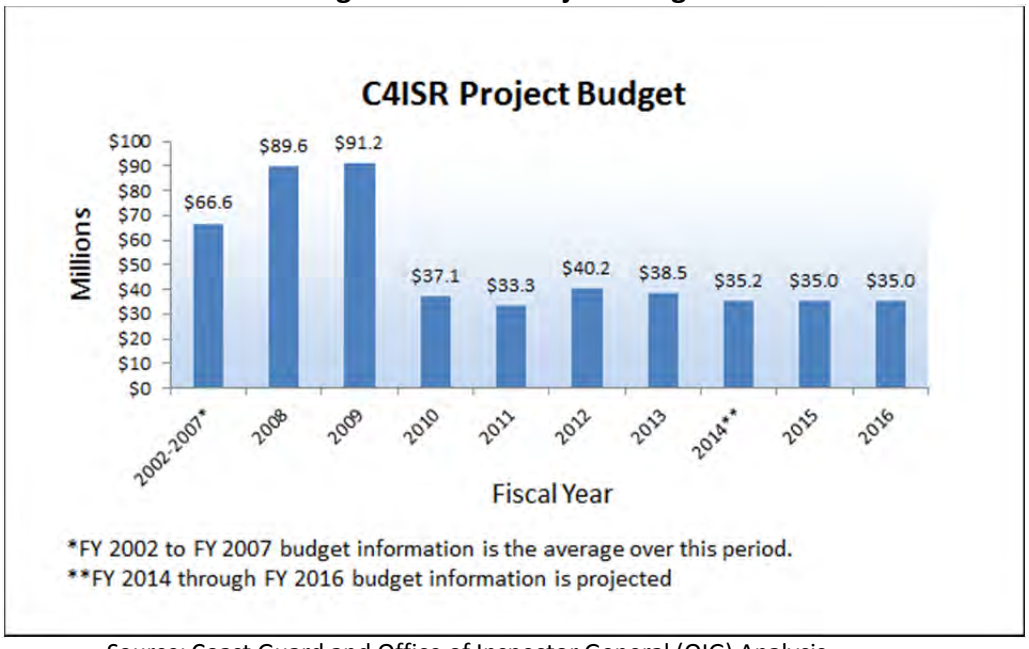
the continued reliance on outdated technology was the biggest challenge for both aircraft.

The Coast Guard initially planned to implement a new upgraded version of the mission system for these aircraft as part of Segment 2 of C4ISR development. The Coast Guard made limited upgrades to these aircraft with Segment 2, including an upgrade to the hand controller for the camera system and a software update to part of the system. However, the Coast Guard did not carry out plans to develop the next-generation aviation mission system to fully replace the obsolete system currently in use.

C4ISR Project Funding Reductions

Coast Guard officials said that the planned C4ISR upgrades to legacy cutters and the C-130J and HC-144A aircraft were not carried out because of significant funding reductions to the C4ISR Project. Specifically, the Coast Guard reduced the overall planned acquisition spending for the project from $2.2 billion to $1.4 billion. Consequently, the project's annual budget was reduced by more than $50 million from FY 2009 to FY 2010. Figure 5 shows historic spending levels for the project, the reduction that took place in FY 2010, and the projected budget through FY 2016.

**Figure 5. C4ISR Project Budget**




*Source:* Coast Guard and Office of Inspector General (OIG) Analysis

Because of this significant budget reduction, the C4ISR Project could not carry out all planned activities, including updates to legacy cutters and aviation C4ISR. The project has revised its plans based on budget reductions, but these plans do not address technology obsolescence with legacy cutters and the aviation mission system. Both the legacy cutter upgrades and the next generation aviation mission system are considered "unbudgeted," meaning that they have been deferred until funding becomes available.

Continued Reliance on Obsolete Technology

Without the planned C4ISR enhancements, legacy cutters and aircraft continue to rely on obsolete technology that hinders mission performance. For example, Coast Guard personnel aboard one legacy cutter reported experiencing problems with a malfunctioning surface search radar system, including the need to reboot the system several times a day and system breakdowns while at sea. Failure of this radar system is considered the highest category of equipment failure, meaning a deficiency exists in mission-essential equipment that causes a loss of at least one primary capability onboard the cutter. When this radar breaks down while at sea, legacy cutters rely on a 40-year old backup radar system that has limited capability.

Reliance on obsolete technology has also negatively impacted aircraft mission performance. For example, Coast Guard personnel aboard the HC-130J aircraft said that the mission system's video and mission processor overloads and must be restarted if operators attempt to update the common operating picture with large amounts of data while conducting an operation. Personnel said that it can take 30 minutes to restart the system, which affects the aircraft's radar and sensors and greatly reduces its operational capability. For this reason, operators turn this functionality off while conducting missions. This limits the information they have about potential targets and other entities in their area of operations.

Continued reliance on obsolete technology has also made operations and maintenance more difficult and costly. For example, Coast Guard personnel are unable to obtain replacement parts easily for the obsolete surface search radar system onboard legacy cutters. Cutters that are in need of replacement parts for the radar must sometimes take parts from other ships that are in port. Likewise, Coast Guard personnel who maintain the HC-130J aircraft said that they cannot easily obtain replacement parts such as circuit boards and cards that are no longer produced.

Further, obsolete software within the aircraft mission system presents system security risks. Specifically, the aircraft mission system uses the Microsoft

Windows XP operating system, which was first released in 2001, and Windows Server 2003, both of which became obsolete in April 2014. After this date, the manufacturer no longer fully supports these products, and the mission system might not be able to meet system security requirements and could lose its Authority to Operate.[10] Coast Guard personnel said aircraft could lose critical communications tools, such as the classified chat capability, if the mission system lost its Authority to Operate. Microsoft can continue to provide support for these products but at a greater cost.

In addition, the Coast Guard is unable to supply mission systems to its newest HC-130J and HC-144A aircraft because of the current mission system's reliance on obsolete technology. Although the Coast Guard has purchased a total of 9 HC-130J aircraft and 18 HC-144A aircraft, it can only provide mission systems to 8 of the HC-130Js and 17 of the HC-144A aircraft. The Coast Guard cannot provide mission systems to the most recently obtained aircraft because components of the current mission system are no longer available.

The Coast Guard has taken steps to address obsolescence with both the legacy cutters and aircraft. Specifically, the Command, Control, and Communications Engineering Center within the Coast Guard's IT division acquired funding to update the outdated surface search radar on legacy cutters. This center has completed updates to the High Endurance Cutters and has planned upgrades to Medium Endurance Cutters. The Coast Guard has also established the Legacy Cutter C4ISR Upgrade Working Group to recommend necessary upgrades to keep legacy cutters operational. In addition, in early 2014 the Coast Guard selected, and Congress funded, a replacement mission system for the HC-130J and HC-144A aircraft, called Minotaur. The Minotaur system is currently used on both the U.S. Navy and U.S. Customs and Border Protection aircraft, which the Coast Guard anticipates will enhance affordability and sustainability. However, until these plans and activities are completed, legacy cutters and the HC-144A and HC-130J aircraft continue to rely on obsolete technology.

[10] Authority to Operate is the official management decision given by a senior organizational official to authorize operation of an information system and to explicitly accept the risk to organizational operations based on the implementation of an agreed upon set of security controls.

**Recommendations**

We recommend that the Coast Guard Deputy Commandant for Mission Support:

**Recommendation #1:**

Define and implement a plan of action and milestones to provide legacy cutters sufficient C4ISR capabilities to carry out their mission while replacement cutters are being built.

**Recommendation #2:**

Complete the implementation of an upgrade solution for the aircraft mission system.

**Management Comments and OIG Analysis**

We obtained written comments on a draft of this report from the Rear Admiral serving as the Assistant Commandant for Resources and Chief Financial Officer for the Coast Guard. We have included a copy of these comments in their entirety in appendix B.

In the comments, the Rear Admiral concurred with our recommendations and provided details on the current actions to address specific findings and recommendations in the report. We have reviewed management's comments and provided an evaluation of the issues outlined in the comments that follow.

In response to recommendation 1, the Rear Admiral concurred and stated that the Coast Guard is implementing a strategy to provide C4ISR capabilities for legacy cutters. However, funding reductions to the C4ISR Project have caused the Coast Guard to modify its plans. The Rear Admiral reported on how different Coast Guard components work together using the Coast Guard logistics system to provide C4ISR capabilities. The Coast Guard has also implemented the C4ISR & IT Resource Council, which functions as a senior level governing body supporting the Chief Information Officer, to provide strategic vision and leadership for C4ISR. The Rear Admiral stated that the Coast Guard has developed a strategy to provide C4ISR capabilities to legacy cutters and a way to implement this strategy; therefore, this recommendation should be closed.

We recognize the actions taken by the Coast Guard to define and implement a plan of action to provide legacy cutters with sufficient C4ISR capabilities as positive steps toward addressing recommendation 1. Because of the importance

of the legacy cutters' mission, and previous delays and modifications to planned C4ISR upgrades to legacy assets, we look forward to receiving additional documentation on providing legacy cutters with the necessary C4ISR capabilities prior to closing this recommendation.

Responding to recommendation 2, the Rear Admiral concurred and stated that the Coast Guard has drafted a plan to transition the HC-130J and HC-144A mission system from acquisition to sustainment 5 years earlier than initially planned due to the shift to the Minotaur mission system. The Rear Admiral indicated that completion of this recommendation is anticipated at the end of FY 2016 when both the HC-130J and the HC-144A prototypes are expected to be completed. We recognize these actions as positive steps and look forward to learning more about continued progress in the future.

**Planning for Future C4ISR Capabilities**

The Coast Guard has planned effectively to meet the C4ISR needs of the future Offshore Patrol Cutter, which is the last major cutter class that has not yet been built that will require supporting C4SIR technology. Although the Coast Guard could not carry out its original plan for C4ISR on the Offshore Patrol Cutter because of funding reductions, the Coast Guard revised its plans effectively. Specifically, the Coast Guard revised key acquisition planning documents including the Project Life Cycle Cost Estimate and Acquisition Program Baseline to reflect the project's new direction. The revised plans articulate the Coast Guard's transition from developing a new system to using an existing Coast Guard system. The plans also establish a new role for the C4ISR Project as a support entity to assist the Offshore Patrol Cutter acquisition project with C4SIR needs. As a result, C4ISR is better positioned to meet the Offshore Patrol Cutter's critical mission needs, although it will be less capable in some areas than originally planned because of budget cuts.

The Coast Guard, however, did not have plans in place to migrate cutters and aircraft to a common C4ISR platform or to ensure effective support for multiple C4ISR platforms. The Coast Guard currently has several C4ISR platform variations. This variation is due in part to deferral of the next major iteration of C4ISR development intended to provide a common baseline system design across designated cutters and aircraft. The Coast Guard's revised plans indicate that this segment of C4ISR development is deferred until funding becomes available. In addition, the revised plans do not address how the Coast Guard will manage multiple baselines effectively or move to a common platform. As a result, the Coast Guard may face higher life cycle costs and reduced mission effectiveness in the future.

**Planning for C4ISR to Support the Offshore Patrol Cutter**

Federal law and departmental guidance require effective planning to ensure the success of IT development efforts.[11] Initially, the Coast Guard planned to meet the Offshore Patrol Cutter's C4ISR requirements with Segment 3 of C4ISR development. The Coast Guard had estimated that Segment 3 would have a life cycle cost of $229 million. However, when acquisition funding for the C4ISR Project was decreased from $2.2 billion to approximately $1.4 billion, the Coast Guard determined that it could not execute Segment 3 as initially planned. Consequently, the Coast Guard did not complete the first major acquisition deadline for this segment by the end of March 2010 as scheduled in its acquisition plans, resulting in an acquisition schedule breach. However, the Coast Guard revised its plans effectively after funding reductions made the initial Offshore Patrol Cutter C4ISR approach unachievable.

Coast Guard Revised Planning Documents

The Coast Guard revised key planning documents to support its new approach to C4ISR for the Offshore Patrol Cutter. As a result of the missed acquisition schedule deadline, the Coast Guard completed a C4ISR Breach Remediation Plan in March 2011. This plan established a methodology for addressing project challenges, including an assessment of the impact of the schedule breach on the overall investment and the future direction of the C4ISR Project. The Department's Under Secretary for Management approved this plan in April 2011. In addition, in July 2012, C4ISR Project personnel completed a revised Project Life Cycle Cost Estimate, which was approved by the Department in August 2013. A Project Life Cycle Cost Estimate identifies the total cost to the Federal Government of acquiring, operating, supporting, and disposing of the items being acquired. In September 2012, C4ISR Project personnel also completed a revised Acquisition Program Baseline, which was approved by the Department in November 2013. An Acquisition Program Baseline establishes a project's performance requirements, schedule requirements, and estimate of total acquisition cost, which are the key parameters that, if not met, require the Department's Investment Review Board to reevaluate the project.

The revised planning documents include significant changes to the Coast Guard's approach to C4ISR for the Offshore Patrol Cutter. The revised acquisition baseline deferred Segment 3 until sufficient funding is made available. In place of

[11] Public Law 104-106 (1996). DHS AD 102-01, Interim Version 2.0, *Acquisition Directive*, Instruction Appendix B, September 21, 2010.

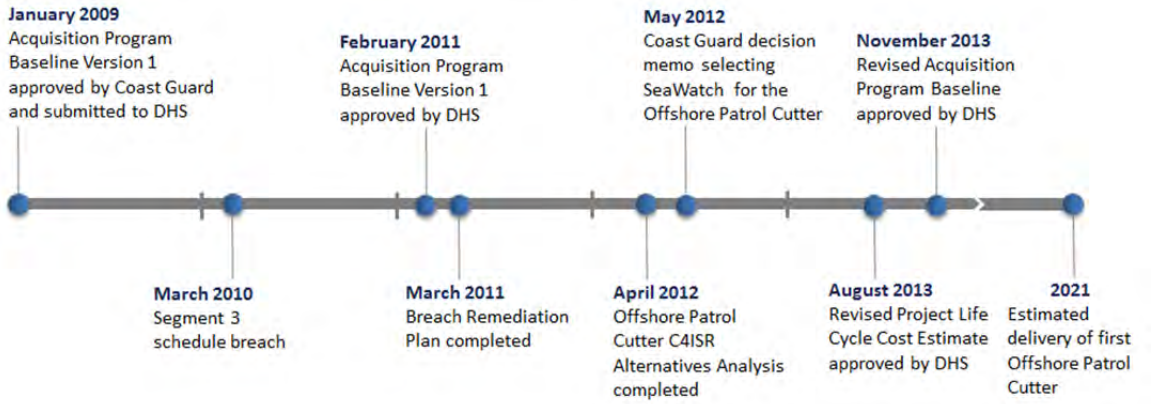
Segment 3, the revised acquisition baseline creates an Offshore Patrol Cutter Asset Acquisition Support element. This new approach repositions the C4ISR Project as a support entity to assist the Offshore Patrol Cutter Project in meeting its essential C4ISR requirements. Rather than developing a new segment of capability, the C4ISR Project is responsible for providing systems integration oversight, project management, assistance obtaining Authority to Operate, and support for acquisition oversight to the Offshore Patrol Cutter Project based on lessons learned from Segments 1 and 2 development efforts. The revised plan also calls for tailoring an existing Coast Guard C4ISR system for the Offshore Patrol Cutter rather than designing and developing a new system. The new acquisition support element has an estimated life cycle cost of $148 million, compared to $229 million for Segment 3.

SeaWatch

In line with the Coast Guard's revised plans, the Coast Guard selected the existing command and control system for the Offshore Patrol Cutter. In April 2012, the Coast Guard completed an alternatives analysis to consider feasible options for the cutter's C4ISR system. This analysis recommended the use of SeaWatch, tailored to meet the Offshore Patrol Cutter's minimum requirements, as one of two best alternatives if the major decision factor was low cost. In May 2012, following this analysis, Coast Guard selected the SeaWatch command and control system as part of the C4ISR acquisition strategy for the Offshore Patrol Cutter.

The selection of SeaWatch reflected senior Coast Guard officials' assessments that SeaWatch provided the lowest technical and cost risks. In addition, reuse of SeaWatch for the Offshore Patrol Cutter provides commonality across several classes of cutters, which is expected to simplify operations and maintenance and reduce costs. Under this approach, the Coast Guard provides the Offshore Patrol Cutter primary contractor with the SeaWatch system to integrate into the cutter's design and development. Figure 6 shows the timeline of events and activities that contributed to the revision of Offshore Patrol Cutter plans.

**Figure 6. Timeline of Revisions to C4ISR Plans**




*Source:* Coast Guard and OIG Analysis

Governance

The Coast Guard was able to revise plans effectively for C4ISR on the Offshore Patrol Cutter in part because of effective governance processes. For example, the Executive Oversight Committee adjudicated the requirements for the Offshore Patrol Cutter C4ISR system that were ambiguous or needed clarification to facilitate potential cost reduction. The Executive Oversight Committee is a senior leadership-level forum that monitors major risks, addresses emergent issues, and provides direction to cross-directorate teams when needed to support successful execution of major acquisition projects.

In addition, the Coast Guard established the C4ISR Resource Council with representation from stakeholders across the Coast Guard to create an integrated vision for all C4ISR systems. The C4ISR Resource Council functions as an advisory entity to the Executive Oversight Committee. In January 2012, the council made recommendations to the Executive Oversight Committee based on a review of Offshore Patrol Cutter C4ISR requirements. The council presented several recommendations pertaining to requirements clarification that were approved by the Executive Oversight Committee, including clarification that SeaWatch, as currently used on the Medium Endurance Cutter, met the minimum requirements of the Offshore Patrol Cutter.

Impact of Revised Plan for C4ISR on the Offshore Patrol Cutter

With the revised plan, the Coast Guard is positioned to provide C4ISR that will support the Offshore Patrol Cutter's requirements. The Coast Guard does not anticipate any gaps in meeting at least the threshold requirements, which are the minimum acceptable standards of performance identified in the Offshore

Patrol Cutter requirements document. In addition, the Coast Guard anticipates being able to meet many of the optimum, or objective, performance goals identified in the Offshore Patrol Cutter requirements document. Specifically, the Coast Guard plans to tailor SeaWatch and leverage capabilities developed and shared by the U.S. Navy, called Navy Type Navy Owned systems, to meet certain objective requirements, including advanced radar capability, contact identification capability called Identification Friend or Foe, and gun weapons system capability.[12]

As a result of the Coast Guard's revised approach, however, the Offshore Patrol Cutter will not have a real-time, tactical C4ISR system equivalent to the National Security Cutter. SeaWatch provides a near real-time common operational picture with navigation capability but was never intended to be a real-time, tactical system. For example, the Offshore Patrol Cutter will not have an integrated combat weapons system. Instead, it will have a standalone weapons control system similar to what is in place on legacy Medium Endurance Cutters. Consequently, operators must orally transmit target information from the command and control system to the combat weapons system operator, rather than pass information electronically in an integrated fashion. Without a real-time tactical C4ISR system, the Offshore Patrol Cutter will provide less robust support for joint Navy operations.

**Planning for a Common C4ISR Platform**

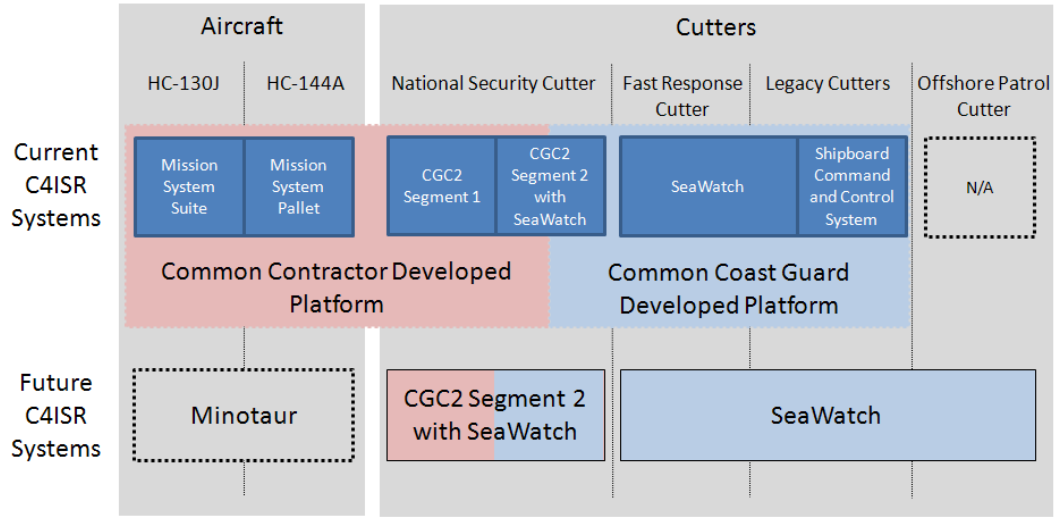
The Coast Guard does not have plans to migrate to a common C4ISR platform or to ensure effective support for multiple C4ISR systems. Although the Coast Guard initially planned to implement a common C4ISR baseline across designated cutters and aircraft, there are currently several C4ISR platform variations in use. The Mission System Suite used by the HC-130J aircraft and the Mission System Pallet used by the HC-144A aircraft share a common contractor-developed software baseline with the National Security Cutter's CGC2 system. In addition to these contractor-developed platforms, the Coast Guard currently uses its own internally developed platform, SeaWatch, and its legacy system, the Shipboard Command and Control System.

Under its current approach, the Coast Guard will evolve toward three C4ISR baseline systems. As discussed earlier in this report, the Coast Guard has decided to transition to Minotaur, a new platform for the HC-130J and HC-144A aircraft.

[12] Identify Friend or Foe is a radio recognition identification system that allows discrimination of friendly units from enemy units.

Additionally, Segment 2 of the CGC2 system for the National Security Cutter incorporates SeaWatch for situational awareness along with a contractor-supported side of its system for tactical, real-time operational needs. This version has already been installed on one National Security Cutter and is scheduled to replace the prior version of CGC2 on the other three in-service cutters, as well as new cutters of this type as they are completed. Finally, SeaWatch will be a common platform across the Fast Response Cutters, legacy cutters, and the future Offshore Patrol Cutters. Figure 7 shows the C4ISR platforms that were in place at the time of this report and the evolution toward three platforms in the future.

**Figure 7. Current and Future C4ISR Platforms**




*Source:* Coast Guard and OIG Analysis

The Coast Guard intended for Segment 3 of C4ISR development to provide a common baseline design across designated cutters and aircraft. The planned migration to a common platform, however, was indefinitely deferred due to funding reductions. Revised plans indicate that no Segment 3 design or development activity will take place in the FY 2012 to FY 2016 timeframe. Rather, the Coast Guard will focus on implementing existing C4ISR software baselines onto designated cutters and aircraft as they enter the active Coast Guard inventory.

Potential Increased Costs and Reduced Mission Effectiveness

As a result of having to manage multiple C4ISR baselines, the Coast Guard may face higher life cycle costs. Coast Guard officials said that a common C4ISR system across cutters and aircraft would have lowered life cycle costs with reusable, shared hardware and software, as well as through consistent and

repeatable training across platforms. Further, managing the process of replacing obsolete technology is a major challenge because C4ISR systems rely on commercial hardware and software that needs to be replaced more frequently than legacy systems. For example, when Coast Guard began building the fourth National Security Cutter it found that 80 percent of the C4ISR technology that had been used on the prior ship had become obsolete. Without a common system, technology obsolescence may worsen for upcoming cutters and aircraft receiving C4ISR capabilities as each asset takes on responsibility for managing and funding efforts to replace outdated technology independently.

In addition, cutter and aircraft mission effectiveness may decline with the imposition of multiple system baselines, which could increase the complexity of data sharing among operational entities. Stove-piped information pathways prevent the effective dissemination of information that is integral to the command and control process. For example, Coast Guard models have shown that a common C4ISR baseline, combined with effective training and integration with command centers, can increase mission effectiveness in some mission areas by nearly 50 percent. Further, the use of proprietary systems limits the ability to streamline the information exchange process with Coast Guard partners. Migration away from contractor-owned systems toward an open system would help to close interoperability gaps between Coast Guard, DHS, and Department of Defense systems.

**Recommendations**

We recommend that the Coast Guard Deputy Commandant for Mission Support:

**Recommendation #3:**

Define and implement a strategy to manage multiple C4ISR systems across aircraft and cutters efficiently.

**Management Comments and OIG Analysis**

In response to recommendation 3, the Rear Admiral concurred and stated that the Coast Guard has implemented a strategy to efficiently manage multiple C4ISR systems across aircraft and cutters. The Coast Guard uses its logistics system to manage multiple C4ISR systems for all aircraft and cutters that are not part of a major acquisition program. For aircraft and cutters that are a major acquisition or those being modernized as a major acquisition, the Coast Guard Acquisition Directorate works to ensure the successful transition and lifecycle management of C4ISR systems by providing coordination and policy guidance for the Integrated Logistics Support Plans. The Rear Admiral reported that the Integrated Logistics Support Plans help reduce cost, facilitate mission execution and allows for continual improvement through lessons learned. The Rear Admiral requested that the recommendation be closed.

We believe that such efforts are good steps toward addressing our recommendation. Before closing this recommendation we look forward to learning more about how this strategy provides the Coast Guard with the ability to control costs, manage the process of replacing obsolete technology, and avoid stove-piped information pathways while managing multiple C4ISR systems across cutters and aircraft.

# Appendix A
# Objectives, Scope, and Methodology

The Department of Homeland Security (DHS) Office of Inspector General (OIG) was established by the *Homeland Security Act of 2002* (Public Law 107−296) by amendment to the *Inspector General Act of 1978*. This is one of a series of audit, inspection, and special reports prepared as part of our oversight responsibilities to promote economy, efficiency, and effectiveness within the Department.

As part of our ongoing responsibilities to assess the efficiency, effectiveness, and economy of departmental programs and operations, we conducted an audit to determine how effectively C4ISR is supporting Coast Guard mission needs, including the extent to which delivered capabilities have achieved program goals, and the effectiveness of planning for future capabilities.

We researched and reviewed Federal laws, Department management and acquisition directives, and other executive guidance related to the C4ISR Project. We reviewed GAO and OIG reports to determine prior challenges, findings, and recommendations. Additionally, we reviewed C4ISR Project planning documentation including life cycle cost estimate information, acquisition planning documents, mission needs and requirements documents, operational testing reports, and program briefings. We also obtained published reports, directives, memoranda, and news articles regarding the acquisition, development, implementation, capabilities, and effectiveness of the C4ISR Project. Using this information, we designed a data collection approach consisting of focused interviews, documentation analysis, site visits, and system demonstrations to accomplish our audit objectives.

We conducted our audit fieldwork from September to December 2013 at Coast Guard headquarters, district, and sector units located in Washington, DC; Miami, FL; Portsmouth, VA; Virginia Beach, VA; Elizabeth City, NC; Alameda, CA; Petaluma, CA; and Moorestown, NJ.

We held interviews and participated in teleconferences with Coast Guard IT management officials, C4ISR Project management staff, operations personnel, and system end-users. At Coast Guard headquarters, we met with branch chiefs and program managers to discuss their roles and responsibilities related to C4ISR Project management. We met with key personnel from the Acquisitions, Capabilities, and Sustainment Directorates to understand their roles and responsibilities pertaining to C4ISR system funding, procurement, integration, implementation, and maintenance. We also met with representatives from the Command, Control, and Communications Engineering Center, which is responsible for design, development, and sustainment of

various C4ISR systems. Finally, we met with C4ISR technical representatives and observed development laboratories at the Lockheed Martin facility in Moorestown, NJ.

At district and sector units, we met with senior executives, commanding officers, technical representatives, and end-users to understand C4ISR requirements, capabilities, and system use in the field. We collected supporting documents related to the C4ISR Project. We observed C4ISR systems and discussed capabilities on board the Coast Guard Cutters BEAR and STRATTON. Finally, we observed C4ISR simulators and other training facilities at the Coast Guard Training Center in Petaluma, CA.

We conducted this performance audit between August 2013 and July 2014 pursuant to the *Inspector General Act of 1978*, as amended, and according to 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 upon our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based upon our audit objectives.

The principal OIG point of contact for this audit is Richard Harsche, Acting Assistant Inspector General for Information Technology Audits. Major OIG contributors to the audit are identified in appendix C.

# Appendix B
# Management Comments to the Draft Report

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2703 Martin Luther King, Jr. Ave SE
Washington, DC 20593-7000
Staff Symbol: CG-8
Phone: (202) 372-3533
Fax: (202) 372-4960

5730
JUL 30 2014

**MEMORANDUM**

From: T. A. Sokalzuk, RDML
COMDT (CG-8)

Reply to Attn of: Audit Manager
Mark Kulwicki
(202) 372-3533

To: Richard Harsche
Acting Assistant Inspector General
Office of Information Technology Audits

Subj: DHS OIG DRAFT REPORT: U.S.COAST GUARD COMMAND, CONTROL,COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE MODERNIZATION (C4ISR)

Ref: (a) OIG Project No. 13-079-ITA-USCG, dated June 17, 2014

1. This memorandum transmits the Coast Guard's response to the draft report identified in reference (a).

2. The Coast Guard concurs with the three recommendations in the draft report. Our response contained in enclosure (1) demonstrates that the Coast Guard has an existing strategy to provide C4ISR capabilities to legacy aircraft and cutters using the Coast Guard logistics system and a way to implement that strategy. Therefore, the Coast Guard request that you consider Recommendations one and three as Closed and Implemented.

3. If you have any questions, my point of contact is Mr. Mark Kulwicki who can be reached at 202-372-3533.

#

Enclosure (1): USCG Response to OIG Draft Report on C4ISR

**UNITED STATES COAST GUARD STATEMENT ON DHS OIG DRAFT REPORT: U.S.COAST GUARD COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE MODERNIZATION (C4ISR)**
**OIG Project No. 13-079-ITA-USCG**

**OIG Recommendation #1**: Define and implement a plan of action and milestones to provide legacy cutters sufficient C4ISR capabilities to carry out their mission while replacement cutters are being built.

**Response:** Concur. The Coast Guard is implementing a strategy to provide C4ISR capabilities across legacy aircraft and cutters. However, funding reductions to the C4ISR Project have caused the Coast Guard to modify its planned C4ISR upgrades.

The Coast Guard currently uses a logistics system to manage multiple C4ISR systems for all aircraft and cutters. For legacy aircraft and cutters that are not part of a major acquisition program, the Coast Guard's Engineering and Logistics Directorate and the Command, Control, Communications, Computers and Information Technology (C4&IT) Directorate manage the aircraft and cutters' C4ISR systems using the existing Coast Guard logistics system. A key organizational entity within the Coast Guard logistics system is the C4ISR & IT Resource Council (RC). The C4ISR & IT RC functions as a senior-level governing body supporting the Chief Information Officer (CIO) by providing consolidated leadership to form a strategic vision of an integrated C4ISR & IT infrastructure, inform and ensure the execution of the C4ISR & IT Strategic Plan and align the resources to meet the goals and objectives of the C4ISR & IT Strategic Plan. In addition, the C4ISR & IT RC guides investment decisions through annual prioritization of the Operating Expense (OE) budget.

**OIG Recommendation #2**: Complete the implementation of an upgrade solution for the aircraft mission system.

**Response:** Concur. The Coast Guard's Program Management Offices for C4ISR and Aviation Acquisitions are actively working with stakeholders to transition the current HC-130J and HC-144 aviation mission system from acquisition to sustainment, at least five years earlier than planned due to the end of production and the shift to the U.S. Navy Program of Record MINOTAUR mission system. The team has drafted a comprehensive transition plan that should enter the approval cycle in July 2014. A final version of the aviation mission system operating software is being prepared for release, which, except for information assurance updates, will be the final software build for the legacy architecture. Current plans are for the Aviation Logistics Center (ALC) to assume all future sustainment activities on the legacy HC-130J and HC-144 mission system hardware by end of CY 2014.

Following a successful Proof of Concept on both the HC-130J and HC-144, the Office of Aviation Acquisitions and NAVAIR (PMA-290E) have commenced non-recurring engineering (NRE) efforts on upgrades to the HC-130J and HC-144 aircraft mission systems that will implement the MINOTAUR mission system. The FY 2014

Consolidated Appropriations Act provided $12.5 million for the HC-130J and $9.2 million for HC-144 NRE and prototype efforts. Initial prototype designs, installation, integration and testing of the HC-130J and HC-144 are forecasted to be completed in FY 2016. Parallel efforts will develop and test a required ground station, integration lab, mission system trainer and maintenance bench. The Coast Guard anticipates that the final MINOTAUR hardware/software configuration will be utilized in the HC-27J mission system design.

Completion of this recommendation is anticipated at the end of FY 2016 when both the HC-130J and HC-144 prototypes are expected to be completed.

**OIG Recommendation #3**: Define and implement a strategy to manage multiple C4ISR systems across aircraft and cutters efficiently.

**Response:** Concur. The Coast Guard has a strategy to efficiently managing multiple C4ISR systems across aircraft and cutters. That strategy is to use the Coast Guard logistics system to manage multiple C4ISR systems for all aircraft and cutters. Both the C4IT Directorate and the Engineering and Logistics Directorate use the existing Coast Guard logistics system to manage C4ISR systems of legacy aircraft and cutters that are not part of a major acquisition program. For aircraft and cutters that are a major acquisition or those that are being modernized as a major acquisition, the Acquisition Directorate works to ensure the successful transition and lifecycle management of the aircraft and cutters C4ISR systems by providing coordination and policy guidance for the Integrated Logistics Support (ILS) Plans. ILS execution is integral to the Coast Guard logistics system and help acquisition projects transition from procurement to effective operation and sustainment.

In collaboration with other Coast Guard Headquarters Directorates, Acquisition Directorate fosters relationships that help ensure the logistics plans for new assets are sufficient and comply with Coast Guard and Department of Homeland Security (DHS) policy guidance. The ILS process works to maximize commonality and provide cost savings from using as many common parts and components as possible while prudently maximizing competition. By focusing on the supportability of all assets procured under the Coast Guard's major systems acquisition programs, the Acquisition Directorate helps to ensure that logistics requirements facilitate mission execution. Additionally, by bridging the gap between acquisition and long-term maintenance, the Coast Guard can anticipate future issues and build solutions into product lines up front, when practical. This allows for continual improvement through the application of lessons learned. Additionally, this process allows the Acquisition Directorate to more readily transition assets and systems into a ready and capable sustainment program, improving life-cycle management and integration.

At this time, the Coast Guard has an existing strategy to efficiently manage multiple C4ISR systems using the Coast Guard logistics system and a way to implement that strategy through the execution of ILS Plans, as funding permits.

# Appendix C
# Major Contributors to This Report

Richard Harsche, Acting Assistant Inspector General
Steven Staats, Audit Manager
Craig Adelman, Senior Program Analyst
Danny McGrath, Program Analyst
Chris Browning, Program Analyst
Beverly Dale, Referencer

# Appendix D
# Report Distribution

**Department of Homeland Security**

Secretary
Deputy Secretary
Chief of Staff
Deputy Chief of Staff
General Counsel
Executive Secretary
Director, GAO/OIG Liaison Office
Assistant Secretary for Office of Policy
Assistant Secretary for Office of Public Affairs
Assistant Secretary for Office of Legislative Affairs
Commandant, USCG
Vice Commandant, USCG
Deputy Commandant for Mission Support, USCG
Liaison, USCG
Chief Privacy Officer

**Office of Management and Budget**

Chief, Homeland Security Branch
DHS OIG Budget Examiner

**Congress**

Congressional Oversight and Appropriations Committees, as appropriate

## ADDITIONAL INFORMATION AND COPIES

To view this and any of our other reports, please visit our website at: www.oig.dhs.gov.

For further information or questions, please contact Office of Inspector General Public Affairs at: DHS-OIG.OfficePublicAffairs@oig.dhs.gov. Follow us on Twitter at: @dhsoig.

## OIG HOTLINE

To report fraud, waste, or abuse, visit our website at www.oig.dhs.gov and click on the red "Hotline" tab. If you cannot access our website, call our hotline at (800) 323-8603, fax our hotline at (202) 254-4297, or write to us at:

Department of Homeland Security
Office of Inspector General, Mail Stop 0305
Attention: Hotline
245 Murray Drive, SW
Washington, DC 20528-0305