

July 2009

# COAST GUARD

## Better Logistics Planning Needed to Aid Operational Decisions Related to the Deployment of the National Security Cutter and Its Support Assets



GAO

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Highlights of [GAO-09-497](#), a report to congressional committees

## Why GAO Did This Study

As part of its more than \$24 billion Deepwater program to replace aging vessels and aircraft with new or upgraded assets, the Coast Guard is preparing the National Security Cutter (NSC) for service. GAO previously reported on Deepwater assets' deployment delays and the Coast Guard's management of the Deepwater program. GAO was legislatively directed to continue its oversight of the Deepwater program. As a result, this report addresses: (1) the operational effects, if any, of delays in the delivery of the NSC and its support assets of unmanned aircraft and small boats; (2) Coast Guard plans for mitigating any operational effects and any associated costs of these plans; and (3) the extent to which the Coast Guard has plans, to include cost estimates, for phasing in logistics support of the NSC while phasing out support for the High Endurance Cutter (HEC) it is replacing. GAO's work is based on analyses of the (1) operational capabilities and maintenance plans of the NSC and its support assets and (2) data on the HECs' condition; comparison of an NSC and HEC; and, interviews with Coast Guard officials.

## What GAO Recommends

GAO recommends that as the Coast Guard finalizes the Integrated Logistics Support Plan, it should ensure that the plan includes the required logistics support documents to be used and the time frames for completing them. The Coast Guard concurred with GAO's recommendation and is taking action to respond to it.

[View GAO-09-497](#) or [key components](#). For more information, contact Steve Caldwell at (202) 512-9610 or [caldwells@gao.gov](mailto:caldwells@gao.gov).

## COAST GUARD

### Better Logistics Planning Needed to Aid Operational Decisions Related to the Deployment of the National Security Cutter and Its Support Assets

#### What GAO Found

Delays in the delivery of the NSC and the support assets of unmanned aircraft and small boats have created operational gaps for the Coast Guard that include the projected loss of thousands of days in NSC availability for conducting missions until 2018. Enhancements to the NSC's capabilities following the 9/11 terrorist attacks and the effects of Hurricane Katrina were factors that contributed to these delays. Given the delivery delays, the Coast Guard must continue to rely on HECs that are becoming increasingly unreliable. Coast Guard officials said that the first NSC's capabilities will be greater than those of an HEC; however, the Coast Guard cannot determine the extent to which the NSC's capabilities will exceed those of the HECs until the NSC's support assets are operational, which will take several years.

To mitigate these operational gaps, the Coast Guard plans to upgrade its HECs and use existing aircraft and small boats until unmanned aircraft and new small boats are operational, but because the mitigation plans are not yet finalized, the costs are largely unknown. Also, the Coast Guard has not yet completed operational requirements for the unmanned aircraft or new small boats. As a result, the Coast Guard has not determined the cost of the HEC upgrade plan or the operational gap created by the delay in fielding new support assets for the NSC.

The Coast Guard's logistics support plans for its transition to the NSC from the HEC are not finalized, and it has not yet fully determined transition costs. The contractor developed the initial NSC logistics plans, but Coast Guard officials said the plans lacked needed details, such as how the contractor would support the NSC after it becomes fully operational, and so, in 2007, the Coast Guard took over logistics planning. Coast Guard acquisition guidance states that an Integrated Logistics Support Plan should be completed by the time production of an asset is started. Although the first NSC has already been delivered, the Coast Guard has not yet finalized this plan, but expects to do so by October 2009. While the Coast Guard has developed an interim plan, it did not commit to including required logistics support documents to be used or time frames for completing them in the Integrated Logistics Support Plan because it is in the process of determining how to finalize the plan. Ensuring the plan includes these documents and time frames would better prepare the Coast Guard to support the NSC and aid it in making operational decisions given that the Coast Guard has not yet developed a deployment plan or completed cost estimates of the logistics transition from the HEC to the NSC.

#### National Security Cutter - *Bertholf*



Source: U.S. Coast Guard.

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## **Abbreviations**

DHS	Department of Homeland Security
HEC	High Endurance Cutter
LRR	Logistics Readiness Review
MSAM	Major Systems Acquisition Manual
NSC	National Security Cutter
PTFMC	Percent of Time Fully Mission Capable

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United States Government Accountability Office  
Washington, DC 20548

July 17, 2009

The Honorable Robert C. Byrd  
Chairman  
The Honorable George Voinovich  
Ranking Member  
Subcommittee on Homeland Security  
Committee on Appropriations  
United States Senate

The Honorable David E. Price  
Chairman  
The Honorable Harold Rogers  
Ranking Member  
Subcommittee on Homeland Security  
Committee on Appropriations  
House of Representatives

The Deepwater program is the largest acquisition program in Coast Guard history—estimated at more than \$24 billion—and is intended to replace or modernize the Coast Guard’s aging vessels, aircraft, and some communications systems. The first-in-class National Security Cutter (NSC) *Bertholf* is undergoing final trials as the Coast Guard prepares it for full operational service in 2010.<sup>1</sup> We have earlier reported that the Coast Guard has experienced delays with the delivery of the NSC,<sup>2</sup> and the estimated production costs of the NSC class have increased from about \$3.5 billion in 2007 to about \$4.7 billion in 2009.<sup>3</sup> The NSC delays and cost increases have raised questions about whether the Coast Guard will have all the operational capabilities needed to effectively perform its missions and the resources necessary for maintaining its aging High Endurance Cutters (HECs)—the vessels that the NSCs are to replace.

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<sup>1</sup>A group of ships of similar design is called a class. The Coast Guard’s current plans call for the NSC class to include eight cutters, although this is under review.

<sup>2</sup>The delivery delay is a result of problems the Coast Guard experienced during the construction of the first NSC, which caused delays with the deployment of the first and subsequent NSCs.

<sup>3</sup>See GAO, *Coast Guard: Update on Deepwater Program Management, Cost, and Acquisition Workforce*, [GAO-09-620T](#) (Washington, D.C.: April 22, 2009) and GAO, *Coast Guard: Challenges Affecting Deepwater Asset Deployment and Management and Efforts to Address Them*, [GAO-07-874](#) (Washington, D.C.: June 18, 2007).

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The NSC is the first cutter class delivered to the Coast Guard under the Deepwater program, and, according to the Coast Guard, is to be the most technologically advanced class in the Coast Guard, with capabilities to aid the Coast Guard in performing missions worldwide—to include drug interdiction and defense readiness,<sup>4</sup> among others. Compared to the HEC, the NSC is to travel at higher sustained speeds and farther distances from shore for longer time periods and launch and recover upgraded small boats, helicopters, and unmanned aircraft in rough seas—all key attributes in enabling the Coast Guard to implement its increased national security responsibilities resulting from the events of September 11, 2001.

A House Appropriations Committee report accompanying the Department of Homeland Security's fiscal year 2007 appropriations act directed us to continue our oversight of the Deepwater program.<sup>5</sup> Based on this legislative direction, as well as more recent input from House and Senate Appropriations Committee staff, we assessed the Coast Guard's management, operation, and deployment of the NSC. Specifically, this report addresses:

- What operational effects, if any, are anticipated based on delays in delivery of the NSC class and its accompanying support assets of unmanned aircraft and small boats?
- What plans does the Coast Guard have for mitigating any identified operational effects, and what are the costs associated with these plans?
- To what extent has the Coast Guard planned for phasing in logistics support of the NSC and phasing out support of the HEC, and what are the costs associated with this transition?

In conducting our work, we reviewed studies, prior GAO and Department of Homeland Security Inspector General reports, and other relevant documents, such as Quarterly Acquisition Reports to Congress and the HEC 2008 Sustainment Conference Report covering the Deepwater program in general and the NSC and HEC specifically. To identify any operational effects from delays in the delivery of the NSC class, we reviewed the 2007 Deepwater Acquisition Program Baseline and the 2008

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<sup>4</sup>Defense readiness includes participating with the Department of Defense in global military operations.

<sup>5</sup>H.R. Rep. No. 109-476 at 64 (2006).

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NSC Acquisition Plan. We compared the 2007 and 2008 delivery schedules to measure the effects of delivery delays on the number of NSC operational days available to the Coast Guard over the next 9 years. We also analyzed Coast Guard data from fiscal years 2003 through 2008 to determine the number of HEC operational days available to the Coast Guard. To assess the reliability of the operational hour and vessel condition data obtained from the Coast Guard, we reviewed data systems manuals and directives to ensure that the systems included controls for maintaining the integrity of the data. We also interviewed officials knowledgeable about the data and the systems that produced them. On the basis of our assessments, we determined that the data were sufficiently reliable for the purposes of this report. We also reviewed Coast Guard documentation of the acquisition process for the NSC-based unmanned aircraft and small boats and the anticipated schedule for the acquisition of those assets. We toured NSC-Bertholf and HEC-Morgenthau while both were at their home port in Alameda, California, to compare and contrast the new vessel with one of the legacy vessels it is replacing. We also interviewed Coast Guard officials about HEC and planned NSC operational days and capabilities, including the aircraft and small boats that support these vessels.

To address the Coast Guard's plans for mitigating any identified operational effects, we reviewed and analyzed the Coast Guard's mitigation plans contained in the Readiness Management Framework. We also interviewed Coast Guard officials about the Coast Guard's plans and their costs for maintaining and upgrading the HECs for use until the NSCs are delivered, and for using existing aircraft and small boats until new unmanned aircraft and small boats are acquired and deployed.

To assess the extent to which the Coast Guard has plans for phasing in maintenance of the NSCs, we reviewed existing maintenance planning documents, including the Coast Guard's Major Systems Acquisition Manual (MSAM), and the Deepwater contract. We also reviewed a maintenance and logistical readiness study conducted for the Coast Guard by the U.S. Navy.<sup>6</sup> Our analysis included reviewing the methodology, criteria, and assumptions of the study, and discussing the study's scope, assumptions, and conclusions with the Coast Guard. As a result of our

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<sup>6</sup>Naval Sea Systems Command, Department of the Navy, *Logistics Readiness Review (LRR): United States Coast Guard Cutter BERTHOLF (Maritime Security Cutter, Large, WMSL 750): Final Report* (May 2, 2008).



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review and analysis, we determined that the study and its results were reasonable for use in our report. To supplement our document reviews and analyses, we interviewed Coast Guard maintenance and logistics officials regarding the ongoing maintenance planning process and the estimated costs of this process. We also contacted officials representing the maintenance contractor that was originally to perform NSC maintenance for the Coast Guard to solicit their views on NSC maintenance planning.

We conducted this performance audit from October 2008 to July 2009 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 that the evidence obtained provides a reasonable basis for our findings based on our audit objectives.

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## Background

The Coast Guard, an Armed Service of the United States housed within the Department of Homeland Security, is the principle federal agency responsible for maritime safety, security, and environmental stewardship through multimission resources, authorities, and capabilities. According to the Coast Guard, the greatest threat to mission performance is the deteriorating condition and increasing technological obsolescence of its legacy assets. According to the Coast Guard, its assets—such as vessels, aircraft, and shore facilities—are essential to its homeland security missions, as well as sustaining other mission areas, such as search and rescue, law enforcement, and environmental protection. Because many of the Coast Guard’s assets were reaching the end of their expected service lives and were in deteriorating condition, the Coast Guard began the 25-year, more than \$24 billion Deepwater program in the mid-1990s to upgrade or replace vessels and aircraft and to acquire other capabilities, such as improved communications systems.

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## The Coast Guard's Deepwater Program Acquisition Strategy and Management Have Evolved

The Coast Guard has taken more direct responsibility for the Deepwater program acquisition strategy and management in recent years. At the start of the Deepwater acquisition, the Coast Guard chose a system-of-systems strategy that was to replace the legacy assets with an integrated package of assets,<sup>7</sup> rather than using a traditional acquisition approach of replacing individual classes of legacy assets through a series of acquisitions. To carry out this acquisition, the Coast Guard awarded a competitive contract to a systems integrator, which for the Deepwater program was a contractor composed of two major companies—Lockheed Martin Corporation and Northrop Grumman Corporation. Acting as a joint venture called “Integrated Coast Guard Systems” (the contractor), these companies were responsible for designing, constructing, deploying, supporting, and integrating the various assets to meet projected Deepwater operational requirements. However, after experiencing a number of management challenges under the system-of-systems approach, the Coast Guard recognized that it needed to increase government oversight and transferred Deepwater system integration and program management responsibilities, including logistics planning, back to the Coast Guard in April 2007.<sup>8</sup> Furthermore, when the Coast Guard assumed the lead role for Deepwater program management, it decided to consider future work and potential bids on these assets outside of the existing Deepwater contract. By taking this action, the Coast Guard in some cases decided to restart the planning and design of the individual assets. In addition, the Coast Guard took over logistics planning for some assets from the contractor. For example, the Coast Guard, rather than the contractor, is now developing the NSC logistics planning documents including the key logistics document—the Integrated Logistics Support Plan.

The Deepwater program represents the largest acquisition in the Coast Guard's history, and the program has experienced some serious performance and management problems, such as cost overruns, schedule slippages, and assets designed and delivered with significant defects. Since 2001, we have reviewed the Deepwater program and informed Congress, the Department of Homeland Security, and the Coast Guard of the risks

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<sup>7</sup>The Coast Guard's “system-of-systems” approach integrates vessels, aircraft, and communication links together as a system to accomplish mission objectives.

<sup>8</sup>Coast Guard logistics encompasses support activities associated with developing, acquiring, testing, and sustaining the mission effectiveness of operating systems throughout their service lives.

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and uncertainties inherent with the system-of-systems approach.<sup>9</sup> In March 2004, we made recommendations to the Coast Guard to address three broad areas of concern: improving program management and oversight, strengthening contractor accountability, and promoting cost control through greater competition among potential subcontractors.<sup>10</sup> In April 2006, June 2007, and March 2008, we issued follow-on reports describing the Coast Guard's efforts to address these recommendations and provided information on the status of various Deepwater assets, including that the Coast Guard's increased management and oversight of the Deepwater acquisition had resulted in improvements to the program.<sup>11</sup> In June 2008, we reported on additional changes in Deepwater management and oversight that resulted in improvements to the program and that the Coast Guard's mitigating strategies for the loss of patrol boats were achieving results in the near term.<sup>12</sup>

Since the Coast Guard took over the acquisition and management responsibilities for the Deepwater program from the contractor in 2007, it has realized that its knowledge of how the various proposed assets would work together to help meet mission needs were limited because the contractor, in some cases, had developed the plans for these assets without using all of the input from the Coast Guard. In 2001, the contractor completed a study documenting the capabilities, types, and mix of assets the Coast Guard needed to fulfill its Deepwater missions, referred to as the Fleet Mix Study. The Coast Guard has initiated a follow-on study to update the work originally completed by the contractor. The goals of this study

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<sup>9</sup>Prior GAO reports on the Deepwater program are listed in the "Related GAO Products" section at the end of this report.

<sup>10</sup>GAO, *Contract Management: Coast Guard's Deepwater Program Needs Increased Attention to*

*Management and Contractor Oversight*, [GAO-04-380](#) (Washington, D.C.: Mar. 9, 2004).

<sup>11</sup>GAO, *Coast Guard: Changes to Deepwater Plan Appear Sound, and Program Management Has Improved, but Continued Monitoring Is Warranted*, [GAO-06-546](#) (Washington, D.C.: Apr. 28, 2006); GAO, *Coast Guard: Challenges Affecting Deepwater Asset Deployment and Management and Efforts to Address Them*, [GAO-07-874](#) (Washington, D.C.: June 18, 2007); and, GAO, *Status of Selected Aspects of the Coast Guard's Deepwater Program*, [GAO-08-270R](#) (Washington, D.C.: Mar. 11, 2008).

<sup>12</sup>GAO, *Coast Guard: Change In Course Improves Deepwater Management and Oversight, but Outcome Still Uncertain*, [GAO-08-745](#) (Washington D.C.: June 24, 2008) and GAO, *Coast Guard: Strategies for Mitigating the Loss of Patrol Boats Are Achieving Results in the Near Term, but They Come at a Cost and Longer Term Sustainability Is Unknown*, [GAO-08-660](#) (Washington, D.C.: June 23, 2008).

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include validating mission performance requirements and revisiting the number and mix of assets to be procured. The results of this study are expected in the summer of 2009, at which time Coast Guard leadership will assess the results and plan for future asset procurement decisions. According to Coast Guard officials, the Coast Guard plans to update the Fleet Mix Study every 4 years and, as a result, the Deepwater program may change in terms of the numbers and types of specific assets needed.

While the final number may change as a result of the Fleet Mix Study, the Coast Guard currently is projected to take delivery of a total of eight NSCs between 2008 and 2017. In May 2008, the contractor delivered the first-in-class NSC, Bertholf, to the Coast Guard. The Bertholf is undergoing testing and is planned to be fully operational in the fourth quarter of fiscal year 2010. According to the Coast Guard, as of May 2009, the second NSC, Waesche, was 83 percent complete and is scheduled to be delivered in late 2009, while the third NSC, Stratton, was 11 percent complete and is scheduled for a late 2011 delivery. The Coast Guard plans to have each NSC fully operational once testing—which ranges from less than 1 year to 2 years after delivery—is completed. Coast Guard officials stated that the Coast Guard has awarded the contract to begin purchasing materials for the fourth NSC, but the Coast Guard has not awarded a contract for construction of the fourth NSC. Neither materials purchases nor production has begun on the fifth through eighth NSCs because funds for these cutters have not yet been appropriated.

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## Comparison of National Security Cutter and High Endurance Cutter Capabilities and Operations



According to the Coast Guard, the NSC is designed to be capable of helping it execute the most challenging of maritime security mission needs and represents a giant leap forward in capability for the Coast Guard's vessel fleet. The Coast Guard further states that the NSC is to be the largest and most technologically advanced class of cutter in the Coast Guard, with robust capabilities for maritime homeland security, law enforcement, and defense readiness missions. The NSC class is to replace the Coast Guard's aging HEC class and is to provide several capabilities that the HECs do not have, such as the ability to collect, analyze, and transmit classified information; carry, launch, and recover unmanned aircraft, thereby increasing the cutter's surveillance capabilities and range; more easily and safely launch small boats from and return them to the cutter; and travel away from shore for longer time periods.

In 2007, the Commandant of the Coast Guard stated that the NSC will be the most sophisticated and capable cutter the Coast Guard has ever operated, with vastly improved capabilities over legacy HECs. The more

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capable NSCs, for example, are designed to enable the Coast Guard to screen and target vessels faster, and more safely and reliably before they arrive in U.S. waters. As a result of the increased capabilities of the NSCs, the Coast Guard plans to replace 12 HECs with 8 NSCs. Figure 1 provides a comparison of some key operational capabilities between the HEC and its replacement, the NSC.

**Figure 1: Comparison of Capabilities of the High Endurance Cutter and Its Replacement, the National Security Cutter**

Capability	High Endurance Cutter	National Security Cutter
		
Number in fleet	12	8 planned <sup>a</sup>
Year first-in-class cutter commissioned	1967	2008
Crew size	166 (19 officers, 147 crew)	108 (14 officers, 94 crew)
Length	378 feet	418 feet
Days away from homeport	185 days per year	230 days per year <sup>b</sup>
Maximum time at sea without re-provisioning	45 days	60 days
Range	9,600 nautical miles at an average speed of 15 knots	12,000 nautical miles at an average speed of 12 knots
Maximum Speed	29 knots <sup>c</sup>	28 knots
Patrol Speed	12 knots	15 knots
Draft <sup>d</sup>	19 feet	22 feet
Intelligence gathering	On-board intelligence gathering facility (cannot transmit classified data) Helicopter	Secure information system for transmitting classified data (planned) Unmanned aircraft (planned) Helicopters <sup>e</sup>
Weapons	76 millimeter weapon system	57 millimeter weapon system with computer programmable projectiles and an optical sight
Ability to withstand a biological or chemical attack	No	Yes
Aircraft command capabilities	No comprehensive aircraft launch and recovery control center 1 aircraft hangar Partially automated helicopter recovery system	Comprehensive aircraft launch and recovery control center 2 aircraft hangers Fully automated helicopter recovery system (planned)
Small boat capabilities	Carries 2 small boats 2 side-mounted small boat recovery systems	Carries 3 small boats 1 side-mounted small boat recovery system for 1 small boat 1 stern-mounted small boat recovery system for 2 small boats

Source: GAO analysis of Coast Guard data; Photographs courtesy of the Coast Guard.

<sup>a</sup>The Coast Guard is in the process of conducting a fleet mix analysis—expected to be completed in 2009—that is to reevaluate the optimal number of each Deepwater asset (including the NSC) the Coast Guard should acquire.

<sup>b</sup>To achieve 230 days away from homeport, the Coast Guard plans to use a “crew rotational concept” whereby the Coast Guard plans to have four crews staff and operate three cutters on a rotating basis.

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<sup>c</sup>According to the Coast Guard, the age and condition of the HECs, coupled with renovation and modernization modifications made to these vessels over the years, make many HECs unable to achieve a maximum speed of 29 knots.

<sup>d</sup>Draft is the depth of water needed to float the vessel.

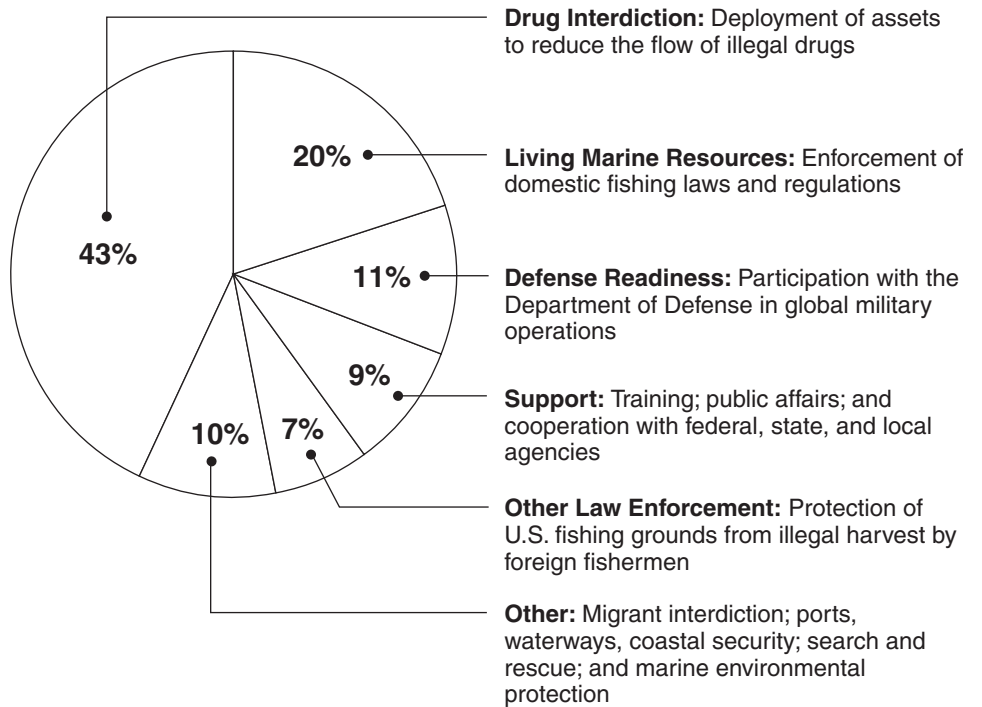
<sup>e</sup>According to the Coast Guard, HEC flight deck is certified to accommodate a multimission helicopter, while the NSC flight deck is certified to accommodate a multimission helicopter and the larger medium-range recovery helicopter.

In addition to the capabilities described in figure 1, according to the Coast Guard, the NSC also has the following capabilities that go beyond those of an HEC:

- NSC's engine and propulsion systems are more efficient than the HEC's; allowing the NSC to transit faster while burning less fuel;
- the higher transit speed of the NSC allows it to maximize the time that it operates inside of the mission area;
- the NSC has the ability to conduct missions in rougher seas than the HEC; and
- the NSC has more comfortable accommodations for the crew, with larger sleeping and living areas that include many modern conveniences, such as computers, entertainment systems, and exercise facilities.

The primary missions the Coast Guard assigns to its HECs include drug interdiction, fisheries patrols, and defense readiness. Together these missions account for over 70 percent of HEC mission assignments. Although the NSC is a multimission cutter that is to help the Coast Guard conduct its full range of missions, the Coast Guard plans to assign the NSC the same mission assignments as the HEC. Figure 2 shows the percentage of time the HEC conducted Coast Guard missions for fiscal years 1999 through 2008.

**Figure 2: Percentage of Operational Hours Logged by Mission for High Endurance Cutters, Fiscal Years 1999 through 2008**



Source: GAO analysis of Coast Guard data.

**Notes:**

While this chart shows the percentage of total operational hours logged by the HECs over a 10-year period, there can be significant year-to-year variation in operational hour totals because of shifting mission priorities, the use of other vessels in filling certain missions, and other factors.

In conducting missions, Coast Guard vessels log the amount of operational hours deployed by mission while on patrol. However, the Coast Guard's system for tracking operational hours captures hours logged in support of the primary mission that a vessel conducts while on patrol; thus, any secondary missions that may have been performed on a patrol by these multimission vessels would not necessarily be reflected in the operational hour data.

Prior to fiscal year 2005, the Other Law Enforcement mission area contained the Enforcement of Laws and Treaties-Other employment category which captured those law enforcement activities that did not fall under drug interdiction, fisheries enforcement, or migration interdiction operations.

There are currently 12 HECs in the Coast Guard, with 2 of them based on the East Coast and another 10 on the West Coast and in Hawaii. To accomplish its missions, cutters like the HEC typically deploy and operate with support assets that aid the cutter in performing its mission requirements. These may include small boats, cutter-based air assets (such as helicopters), or land-based aircraft (such as fixed-wing aircraft or



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helicopters). According to the Coast Guard officials, pairing support assets with a cutter increases its surveillance and intelligence gathering range and improves its search and rescue capabilities.

To maximize the time that the NSC can operate at sea each year without requiring its crews to be away from their home port more than allowed with the HEC, the Coast Guard plans to use a “crew rotational concept.” Under this concept, the Coast Guard plans to have four crews staff and operate three cutters on a rotating basis. By using the crew rotational concept, the Coast Guard hopes that each NSC will be able to provide 230 days away from home port per year as compared to the 185 days away from home port per year provided by each HEC. Days away from home port is a Coast Guard measure that reflects the level of operations for a cutter. The measure represents the days the cutter is not at the port where it is based, including days the cutter is en route to and conducting missions. For purposes of this report, we refer to days away from home port as operational days.

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## Delays in the Delivery of the NSC and Its Support Assets Have Created an Anticipated Loss of Operational Days and Will Result in the NSC Being Deployed without Certain Operational Capabilities

Delays in the delivery of the NSC and its associated support assets—primarily unmanned aircraft and small boats—have created an anticipated loss of cutter operational days and delays in achieving certain other operational capabilities. Enhancements to the NSC’s capabilities following the 9/11 terrorist attacks, as well as damage to the shipyard and the exodus of workers as a result of Hurricane Katrina, contributed to these delays. These delays will require the Coast Guard to continue to rely on its aging HECs to provide cutter operational days and to use existing aircraft and small boats to support the new NSC. Also, certain systems on NSC-Bertholf are currently not functioning as planned, but the Coast Guard plans to resolve these deficiencies before NSC-Bertholf is certified as fully operational, scheduled for the fourth quarter of fiscal year 2010. Because the Coast Guard plans to deploy the first NSC without the planned unmanned aircraft and new small boats, and because on-board deficiencies still exist, the NSC will not initially operate with the full complement of its originally-planned capabilities. As a result, the Coast Guard cannot determine the extent to which the NSC’s final capabilities will exceed those of the HECs at this time and it may take several years before some of these capabilities are realized.

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## Comparison of the 2007 and 2008 Delivery Schedules Shows an Anticipated Loss of Over 3,000 National Security Cutter Operational Days

Delays in deployment of the NSCs between the 2007 and 2008 delivery schedules show an anticipated loss of thousands of NSC operational days. Comparing the 2007 and 2008 delivery schedules shows that the first NSC will likely be 1 year behind schedule when it is certified as fully operational, now scheduled for the fourth quarter of fiscal year 2010.<sup>13</sup> Further, the eighth and final NSC was to be fully operational in 2016, but is currently projected to be fully operational by the fourth quarter of calendar year 2018.

The first NSC was initially projected for delivery in 2006, but slipped to August 2007 after the 9/11 requirements changes.<sup>14</sup> New requirements made after 9/11 to enhance the NSC's capabilities also contributed to these delays and include the following:

- expanded interoperability with the Department of Defense, DHS, and local first responders;
- increased self-defense and survivability, including chemical, biological, and radiological measures;
- increased flight capability via a longer and enhanced flight deck;
- upgraded weapon systems; and
- improved classified communication capabilities.

In addition to the delays brought about by post-9/11 requirements changes and the associated enhancements to NSC capabilities, delivery of the NSC was further delayed until May 2008 because of substantial damage to the shipyard and an exodus of some of the experienced workforce as a result of Hurricane Katrina.

If the Coast Guard maintains its 2008 acquisition schedule, the most recent acquisition schedule available to us, it will face a projected loss of thousands of cutter operational days available from the NSC class for calendar years 2009 through 2017 from what was originally planned.

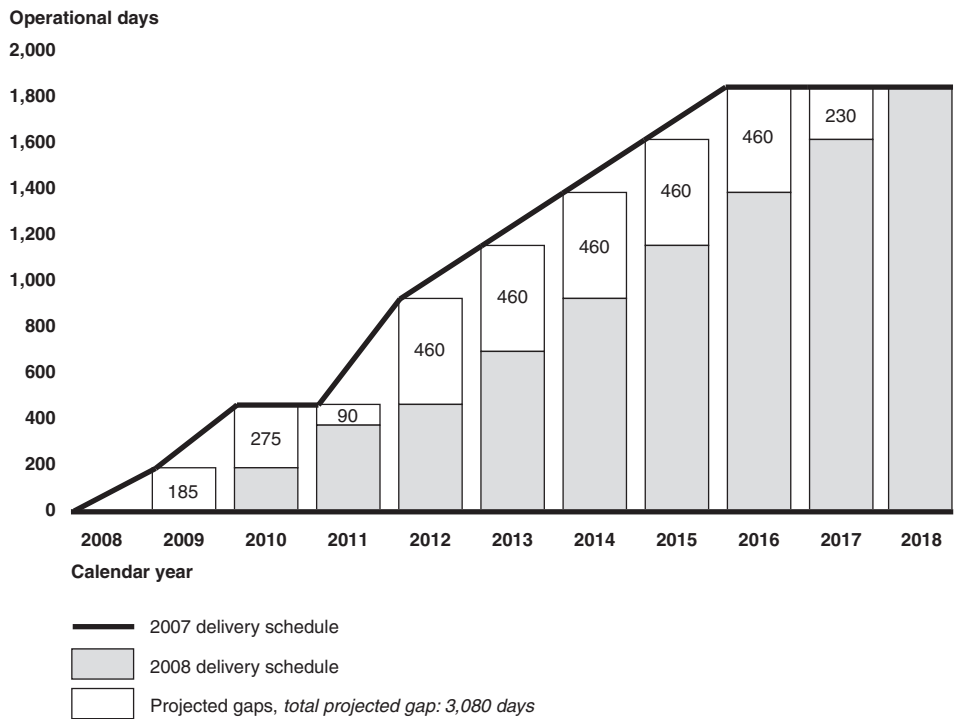
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<sup>13</sup>According to the 2007 delivery schedule, the first NSC was to be certified as fully operational in calendar year 2009.

<sup>14</sup>From 2005 to 2006, the Coast Guard worked to rebaseline the Deepwater program to reflect its post-9/11 mission. The Deepwater Acquisition Program Baseline, approved by the Department of Homeland Security (DHS) in May 2007, reflects those changes.

Specifically, as shown in figure 3, in comparing the number of operational days that were expected to be available from the NSC fleet in the 2007 schedule to what is expected based on the updated 2008 schedule delivery schedule,<sup>15</sup> there is a cumulative projected loss of 3,080 operational days (an “operational gap”).<sup>16</sup>

**Figure 3: Projected NSC Operational Day Gap Resulting from Delivery Delays, Calendar Years 2008 through 2018**



Source: GAO analysis of Coast Guard data.

**Notes:**

HEC cutter operational days are not included in this analysis. The planned number of operational days per year assumes each NSC is operated 185 days per year with a single crew and 230 days per year when the crew rotational concept is employed.

NSCs are expected to be fully operational 1 to 2 years after delivery.

<sup>15</sup> The actual delivery and certification of NSCs as fully operational may happen more quickly or more slowly than expected in these plans.

<sup>16</sup> A cutter operational day is generally logged when the vessel completes at least 4 hours of operations in a given 24 hour period.

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Figure 3 represents the loss of operational capabilities as a result of delivery delays with the NSC, but does not directly translate into lost cutter operational days for the Coast Guard as a whole because it does not take into account any operational days that the Coast Guard anticipates can be provided through continued use of its HECs. Coast Guard officials emphasized that it plans for the HECs to continue to serve until the NSCs become operational. As a result, the Coast Guard officials state that they do not anticipate a gap in operational days, even though they acknowledge that the HECs have fewer capabilities than the NSCs.

While continued operation of the HECs should at least partially mitigate the operational gap shown in figure 3, we believe that this analysis is useful to demonstrate the amount of time that the Coast Guard will be without the enhanced operational capabilities that the NSCs are expected to provide once they are deployed with their full complement of support assets. The Coast Guard is unable to quantify the gap in operational capabilities that it will actually experience, though, because it has not yet completed the HEC decommissioning schedule, which, according to Coast Guard officials, is to be completed in late 2009 at the earliest. The Coast Guard is also not able to estimate the impact of these lost operational days on specific future missions. However, given the enhanced capabilities that NSCs have over the HECs, a loss in NSC operational days could negatively impact the Coast Guards' ability to more effectively conduct missions, such as migrant and drug interdiction, enforcement of domestic fishing laws, and participation in Department of Defense operations.

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### Delays in Delivery of the National Security Cutters Require the Coast Guard to Continue to Rely on Its Aging High Endurance Cutters

Delays in delivery of the NSCs have required the Coast Guard to develop plans to rely on its aging fleet of HECs to continue to perform missions that the NSCs were to take over. However, Coast Guard metrics show that the HECs are becoming increasingly unreliable and, as a fleet, have not met their target number of cutter operational days in each of the past 6 fiscal years. Specifically, the fleet of 12 HECs lost a cumulative total of 118 to 390 operational days each fiscal year from 2003 through 2008. This accounts for 5 to 18 percent of the Coast Guard's annual target of 2,220 days for the HEC fleet. According to the Coast Guard, this loss occurred because of a combination of unscheduled maintenance and additional planned maintenance beyond the 143 maintenance days allotted for each HEC annually, and averaged about 260 lost operational days per year. Coast Guard officials told us that this additional maintenance was the result of the HECs' deteriorating condition. Table 1 shows the actual operational days provided by the HECs from fiscal years 2003 through

2008, and the gap between the days provided and the Coast Guard's annual target of 2,220 days.

**Table 1: HEC Operational Days Lost During Fiscal Years 2003 through 2008**

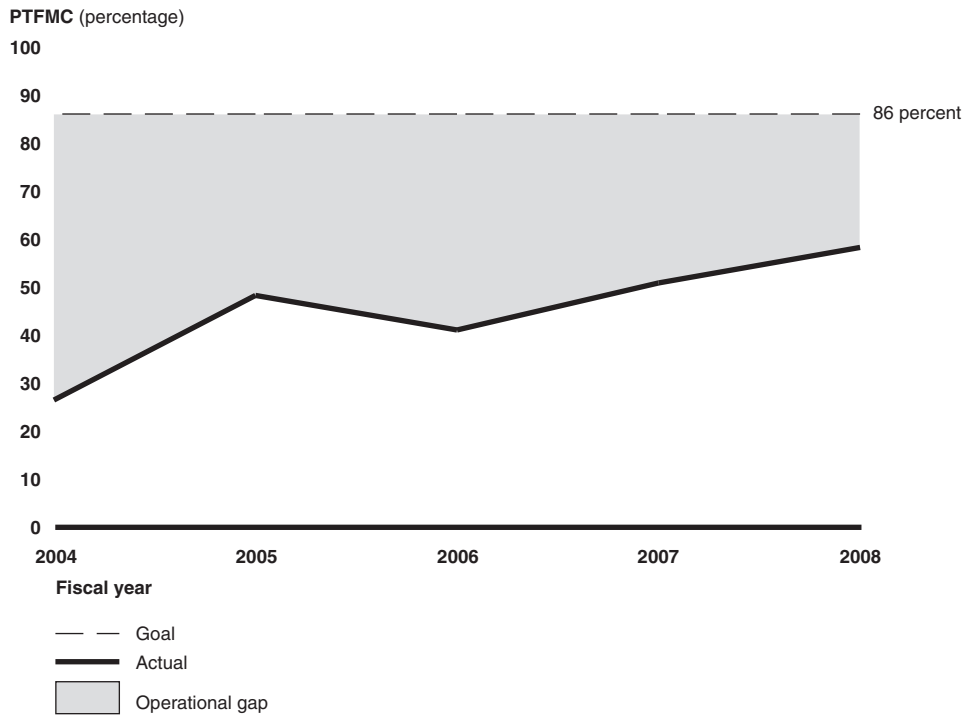
Fiscal year	HEC actual operational days	HEC operational days lost <sup>a</sup>	Days lost as a percent of 2,220-day target
2003	1,956	264	12
2004	2,012	208	9
2005	2,102	118	5
2006	1,830	390	18
2007	1,959	261	12
2008	1,879	341	15

Source: GAO analysis of Coast Guard data.

<sup>a</sup>The Coast Guard sets an annual target of 185 operational days per cutter each year for a total of 2,220 operational days (12 cutters x 185 days per cutter) for the HEC fleet.

Another measure of the condition of the HEC fleet is the percent of time [it is] fully mission capable (PTFMC). This metric reflects the percentage of time that the cutters operate without a major equipment failure or loss in mission capabilities. For example, a PTFMC of 50 percent indicates that the cutter had one or more major equipment failures (or casualties) that degraded or forced the termination of missions for half of the cutter's operational days in a given year. From fiscal years 2004 through 2008, the HECs' PTFMC was 59 percent or less, while the Coast Guard's PTFMC goal for the HEC class was 86 percent. Figure 4 shows the PTFMC for the HECs during that period.

**Figure 4: Percent of Time Fully Mission Capable (PTFMC) for HEC Class, Fiscal Years 2004 through 2008**



Source: Coast Guard.

Coast Guard officials said that because of the age and condition of the HECs, they anticipate that the maintenance needs of the cutters will continue to increase over time. According to Coast Guard officials, the loss of cutter operational days and the gap between the actual PTFMC of the HEC class and the Coast Guard's goal of 86 percent would negatively impact their drug interdiction, defense readiness, alien migrant interdiction, and living marine resource missions. The HECs were commissioned during 1967 to 1972 and have an estimated service life of about 40 years, affected in part by a rehabilitation and service life extension program that began in the late 1980s and ended in 1992. As part of this program, each cutter received an overhaul, costing from \$70 million to \$90 million per cutter. Many major propulsion and hull systems, however, were overhauled but not upgraded or replaced, and these systems are now at or near the end of their useful service life.

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## The First National Security Cutter Will be Deployed without Planned Support Assets

The Coast Guard plans to deploy the first NSC, scheduled to become fully operational in the fourth quarter of fiscal year 2010, without its planned support assets of unmanned aircraft and new small boats. In addition, based on our review of a Coast Guard study, future NSCs may begin missions without the originally-planned unmanned aircraft.<sup>17</sup> The Coast Guard plans to draft operational specifications for the unmanned aircraft in 2010, and to acquire new small boats that will be deployed with the first NSC by the end of calendar year 2010. As a result, because Coast Guard has not determined the needed specifications, the extent of the operational gap created by the lack of these assets is not known at this time. In particular, a Coast Guard acquisition official said that the Coast Guard has not yet selected the type of unmanned aircraft that is to be deployed with the NSC, but plans to do so by the third quarter of fiscal year 2012. After the unmanned aircraft is selected, the Coast Guard must contract for the acquisition and production of the aircraft, accept delivery of it, and test its capabilities before deploying it with the NSC—activities that can take several years.

The NSCs are designed to be deployed with the following combinations of support aircraft:

- 2 helicopters<sup>18</sup> or
- 1 helicopter and 2 unmanned aircraft or
- 4 unmanned aircraft.

The helicopter may be used for surveillance, rescue operations, or airborne use of force, whereas the unmanned aircraft is intended to increase the NSC's surveillance capabilities. In addition to the support aircraft, the NSC is intended to be deployed with three new small boats, rather than the two small boats on the HECs, and, according to the Coast Guard, will be able to launch and recover small boats in rougher seas than the HEC. The small boats are designed to assist the Coast Guard in

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<sup>17</sup>*Deepwater Vertical Unmanned Aerial Vehicles (VUAV) Path Forward Study Group: Phase II Alternatives Analysis Report*, United States Coast Guard Research and Development Center (August, 2007).

<sup>18</sup>The helicopter the Coast Guard plans to deploy with the NSC is its HH-65 multimission helicopter. The NSC can also launch and recover medium-range recovery helicopters, but the NSC hangar is not large enough for this helicopter to be deployed with the NSC for long periods of time.

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conducting vessel boardings, pursuing and interdicting vessels suspected of unlawful behavior, and conducting search and rescue operations. The Coast Guard currently operates the helicopters that can be deployed with the NSC, but has restarted the acquisition of the small boats and is in a pre-acquisition process for the unmanned aircraft because the operational requirements for the unmanned aircraft and small boats, as set forth by the contractor, did not meet the Coast Guard's needs. These support assets are to provide the NSC with surveillance and other capabilities beyond those of the HECs. However, until operational requirements are completed and the unmanned aircraft and small boats are delivered, these increased capabilities of the NSC will not be realized by the Coast Guard. Coast Guard officials acknowledged that the lack of unmanned aircraft would create a gap between the NSC's actual and planned capabilities, but noted that deployment of existing small boats with the NSC would mitigate any capability gap created by the absence the new small boats, as discussed later in this report.

## Unmanned Aircraft

The Coast Guard has not finalized the operational requirements or acquisition schedule for the unmanned aircraft to be deployed with an NSC, making it difficult for the Coast Guard to quantify the expected operational gap. Acquisition of the unmanned aircraft was discontinued by the Coast Guard in 2007. According to Coast Guard officials, the Coast Guard discontinued this acquisition because the technology was unproven and the projected costs were greater than those originally planned.<sup>19</sup> According to a Coast Guard acquisition official, the Coast Guard will assess alternative aircraft platforms and plans to select one by the third quarter of fiscal year 2012 for acquisition. Having assumed responsibility for the acquisition of the unmanned aircraft from the contractor, the Coast Guard is to follow the processes set forth in its acquisition guidance. However, because the acquisition program is in its early stages, the Coast

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<sup>19</sup> As we previously reported in 2008 [*Coast Guard: Change In Course Improves Deepwater Management and Oversight, but Outcome Still Uncertain*, GAO-08-745 (Washington D.C.: June 24, 2008)], the Deepwater Implementation Plan initially included procurement of 45 cutter-based Vertical Unmanned Aerial Vehicles (VUAV) and associated control stations. In the fall of 2006, the Coast Guard initiated a multiphase VUAV alternatives analysis. Phase I, completed in February 2007, recommended against proceeding with the VUAV effort because of developmental and cost concerns. Phase II, completed in August 2007, concluded that small, tactical, cutter-based Unmanned Aerial Systems (UAS) and long-endurance, land-based UASs might fulfill most of the maritime surveillance performance gap if a maritime VUAV were not available. The Coast Guard received \$3 million in the fiscal year 2009 budget to continue to study possible approaches going forward.



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Guard has not yet determined a date for the deployment of an NSC-based unmanned aircraft.

## Small Boats

The capabilities of the small boats that are to be deployed with the NSCs are also not currently defined. According to Coast Guard officials, the original small boat capabilities as planned by the contractor were not realistic. For example, Coast Guard officials told us that operational requirements—such as the inclusion of gun mounts, a top speed of 45 knots, and communication suite requirements—may have been achievable individually, but were not feasible when taken together. Coast Guard officials said that they do not yet know what the new operational requirements will be, but that they plan for the new small boats to have greater capabilities than the legacy small boats, which will further enhance the capabilities of the NSC. The Coast Guard planned to finalize the operational requirements by summer 2009, and Coast Guard officials anticipate deployment of the small boats by the end of calendar year 2010. However, until these operational requirements and a determined delivery schedule are in place, the Coast Guard is unable to quantify the operational gap that will be created by the absence of the new small boats that were to have been deployed on the NSC.

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## The Coast Guard Is Addressing National Security Cutter Onboard Deficiencies

In addition to the gaps created by lost operational days and the absence of the unmanned aircraft and small boats, the Coast Guard has identified several operational deficiencies onboard NSC-Bertholf that it plans to address by the end of calendar year 2010. In particular, according to Coast Guard officials, three deficiencies are to be addressed before the cutter is certified as fully operational in the fourth quarter of fiscal year 2010. Details on these three deficiencies are as follows:

- First, NSC-Bertholf currently lacks a shipboard sensitive compartmented information facility required for participation in certain Department of Defense missions and exercises. Coast Guard officials told us that building such a facility was a post-9/11 requirement the manufacturer did not have time to integrate into NSC-Bertholf. This facility is to improve communication of sensitive and classified information with other Coast Guard and Department of Defense assets and shore facilities. Work on the facility is underway and the Coast Guard plans to complete the installation and testing in February 2010. According to Coast Guard officials, the Coast Guard will also be responsible for installing similar facilities on the future NSCs, as they will not be installed by the contractor during construction for security reasons.

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- Second, full installation of technology that aids the movement of helicopters into the NSC's two hangars is not yet complete, because the helicopters that are to be deployed with the NSC have not yet been modified to use this technology. NSC-Bertholf is equipped with a system designed to automatically secure helicopters after landing and then move them into a hangar. According to Coast Guard officials, this system reduces the number of crew members needed to assist in landing the helicopter and increases the safety of the landing process. The system has been installed on NSC-Bertholf, but the Coast Guard has not yet completed the modification of the helicopters to enable them to integrate with the system. Therefore, the Coast Guard plans to manually tie down and move the helicopters until the modification is complete, which, according to Coast Guard officials, is planned for March 2010. Coast Guard officials stated that the system is to be included during construction of all future NSCs.
  - Third, the functionality of the stern ramp and doors used to launch small boats on NSC-Bertholf is limited. Coast Guard officials reported that the doors do not open and close as expected and that the doors are safe to operate only when the NSC is moving at speeds of 5 knots or less, because sections of the doors protrude into the water at the edge of the cutter when they are opened. The stern launch system facilitates the launch and recovery of small boats and requires fewer crew to operate than traditional side-launch systems that rely on cranes to both lower the small boats into the water and then raise them on to the cutter when their missions are completed. Replacement doors have been designed that angle up, away from the water, and are equipped with a mechanism that will better handle their weight to enable them to operate more reliably and safely. According to the Coast Guard, the new doors are to be retrofitted to NSC-Bertholf when the cutter goes in for a maintenance period, planned for March 2010, and are to be installed on future NSCs during their construction.

Until these onboard deficiencies are addressed and the NSC's unmanned aircraft and new small boats are delivered, the NSC will be operating without planned assets that would enhance its capabilities over those of an HEC. Coast Guard officials stated, though, that even without the planned unmanned aircraft and new small boats, NSC-Bertholf's capabilities will be greater than those of an HEC when it is certified as fully operational at the end of fiscal year 2010. In particular, the officials stated that, among other things, the NSC will have improved habitability, increased transit speeds, better fuel efficiency, and a superior weapons system. However, some of these improvements have not been fully tested

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and the NSC will initially not have other key capabilities, such as the unmanned aircraft, which will require several years of construction and testing after its initial selection in 2010.

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### **The Coast Guard Plans to Mitigate Identified Operational Gaps by Upgrading Certain High Endurance Cutters and Using Existing Support Assets, but the Success and Costs of These Plans Cannot Be Fully Determined**

To mitigate the operational gaps identified to date that have been created by delays in deployment of the NSC and its associated support assets, the Coast Guard plans to keep the HECs operational and to use existing air assets and small boats until new assets are acquired. However, the costs of these plans and the extent to which these plans will successfully mitigate gaps caused by delivery delays cannot be fully determined at this time.

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### **The Coast Guard Plans to Perform Upgrades and Maintenance on the High Endurance Cutters to Help Mitigate Lost Cutter Operational Days, but Complete Costs Cannot Be Determined**

The Coast Guard plans to perform a series of upgrades and maintenance procedures on its HECs to help mitigate the loss of NSC operational days, but the complete costs of these improvements cannot be determined because the Coast Guard has not finalized its plans for completing these tasks, nor has funding been provided. The Coast Guard has also begun a management initiative to increase the number of operational days available from the HECs, given delays in deploying the NSCs. However, because these plans have not yet been finalized and the Coast Guard could not provide estimated completion dates, the extent to which these plans will help mitigate the loss of cutter operational days faced by the Coast Guard cannot be fully determined at this time. More specifically, the Coast Guard's mitigation plans include three key elements, as follows:

- First, the Coast Guard plans to overhaul or replace equipment on selected HECs through an HEC sustainment program. According to Coast Guard officials, the purpose of the program is to replace obsolete or increasingly unsupportable parts and equipment to lower the cost of future HEC maintenance and increase the number of days that the HECs are able to operate each year. Depending on the state of each individual HEC, the sustainment program could include repairs or

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upgrades to the hull and propulsion machinery, fire alarm systems, air-conditioning and refrigeration systems, or other equipment that has become difficult to maintain. According to Coast Guard officials, they do not expect that all of the HECs will receive these upgrades; rather, the selection of the cutters to be upgraded is to be based on an analysis of their condition. Coast Guard officials stated that the analysis of the condition of the HECs is expected to begin in 2011, and that the work to overhaul the selected cutters is to begin in 2015, with work on the first selected HEC to be completed in 2016. Based on these time frames, there will be a loss of cutter operational days resulting from the deteriorating condition of the HECs for at least the next 7 years, until 2016. During the years in which the Coast Guard carries out the sustainment program, the operational gap created by lost cutter operational days could widen because each HEC selected for upgrade is to be taken out of service for 1 year while the necessary work is completed. Coast Guard officials noted that this is required in order for HECs to continue operations until the NSCs are deployed and that they intend to coordinate the HEC upgrades, the HEC decommissioning schedule, and the deployment of the NSCs to ensure that a combination of 12 HECs and NSCs are available for operations while HECs are removed from service for upgrades. The Coast Guard officials said that they have drafted the sustainment program proposal, but it was not finalized at the time of our review and the Coast Guard does not have an estimated date for when it will be completed. The officials added that they could not predict whether this program would be funded.

- Second, in 2007, the Coast Guard implemented a management initiative to (1) clearly define HEC maintenance goals, (2) enumerate tasks to achieve those goals, (3) assign personnel responsible for each goal, and (4) provide a means of measuring whether the goal had been achieved, in order to improve the readiness of the HECs based on the West Coast and Hawaii.<sup>20</sup> For example, the Coast Guard personnel responsible for the HECs' maintenance were assigned the goal of improving HEC engineering equipment readiness, including tasks such as reducing the time taken to address failures in essential equipment to less than 15 days. Similarly, the commanding officers of each HEC were assigned the goal of improving scheduled preventive maintenance completion rates and to keep records to measure how much of this maintenance was completed. Through regular analysis of

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<sup>20</sup> Readiness is the ability to execute mission requirements in keeping with Coast Guard standards.

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the measures associated with each goal or task, the responsible personnel are to identify issues that may impact mission readiness, develop and implement corrective actions, and evaluate the effectiveness of those actions. While this management initiative is still ongoing, Coast Guard officials stated that they believe it has been successful. For example, the officials told us that from 2006—the year before the initiative began—through 2008, the number of HEC equipment failures that impacted missions declined by over 50 percent.

- Third, in advance of the HEC sustainment program, the Coast Guard intended to increase funding for HEC maintenance by \$10 million during fiscal year 2010. However, Coast Guard officials reported that their request for the funding—intended to enable the Coast Guard to complete HEC maintenance that had been deferred over time and address the near-term maintenance needs of the HECs until the sustainment program begins—was not included in the fiscal year 2010 budget.<sup>21</sup>

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### The Coast Guard Plans to Address Operational Gaps Caused by Delays in the Delivery of Unmanned Aircraft and Small Boats with Existing Assets, Thus Costs May Not Increase

According to the Coast Guard, operational gaps caused by delays in the delivery of unmanned aircraft and small boats are to be addressed through the use of existing aircraft and small boats and thus, it likely would not incur new costs. The unmanned aircraft is intended to increase the NSC's surveillance capabilities, while the small boats are designed to assist the Coast Guard in conducting vessel boardings, pursuing and interdicting other vessels, and conducting search and rescue operations. The Coast Guard has not yet finalized the operational requirements of these assets; therefore, it is not yet able to quantify the gap in aircraft surveillance and small boat missions created by their absence.

Manned aircraft currently provide surveillance support to the HECs and other Coast Guard vessels and could be assigned to support NSC missions, as needed. While existing aircraft would provide the NSCs with a level of air support comparable to that currently provided to the HECs, a Coast Guard study found that manned aircraft cannot provide the same level of surveillance capabilities that would be provided by a cutter-based

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<sup>21</sup>The American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (February 17, 2009) provided funds to the Coast Guard's acquisition account to help pay for HEC upgrades.

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unmanned aircraft.<sup>22</sup> Because the NSCs are to replace decommissioned HECs, Coast Guard officials told us that the level of support provided by the manned aircraft to the NSCs is not expected to be greater than that currently provided to the HECs. Therefore, the Coast Guard would, theoretically, not incur new costs in assigning existing air assets to the NSC as the HECs are decommissioned and no longer need air support.

According to Coast Guard officials, the Coast Guard plans to deploy the first NSC with existing small boats until new small boats are acquired. During its operational testing period, NSC-Bertholf is using a prototype small boat delivered by the contractor, as well as small boats used on the HEC class. According to Coast Guard officials, there is no additional cost to use these small boats beyond the funds already allocated for small boat operations. Furthermore, Coast Guard officials told us that the configuration of the small boats on the NSC will enhance its small boat capabilities relative to the HECs. In particular, the NSC will be equipped with three small boats, rather than the two small boats on the HECs, and will be able to launch and recover small boats in rougher seas than the HEC. Nevertheless, the lack of operational requirements and a delivery schedule for new small boats precludes the Coast Guard from quantifying the gap between the capabilities of the existing small boats and those that it intends to acquire. As a result, the Coast Guard has not determined the extent to which existing small boats will help mitigate the operational gap between the existing small boats that will be initially deployed on the NSC and the new small boats with which the NSC will deploy in the future.

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## The Coast Guard Is Working to Finalize Its Key Logistics Plan by October 2009, but Complete Logistics Costs Cannot Yet Be Determined

The Coast Guard has begun planning for the logistics support transition to the NSC from the HEC, and is working to finalize its key NSC logistics support plan by October 2009, but the Coast Guard cannot determine the complete logistics transition costs. While the Coast Guard is generally following the process established in its acquisition guide and is developing logistics plans to support the NSC, the key logistics support plan has not been finalized and approved within required time frames. In particular, to meet the near term logistics needs of NSC-Bertholf, the Coast Guard has developed and is using an interim support plan, but this plan does not include the requisite descriptions of the detailed documents that the Coast

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<sup>22</sup>*Deepwater Vertical Unmanned Aerial Vehicles (VUAV) Path Forward Study Group: Phase II Alternatives Analysis Report*, United States Coast Guard Research and Development Center (August, 2007).

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Guard plans to use to provide logistics support to the NSC or time frames for completing these documents. Further, according to its acquisition guide, the Coast Guard's key logistics support plan—the Integrated Logistics Support Plan—for the NSC should have been finalized prior to the start of production on the first NSC in June 2004; but the Coast Guard has not finalized or approved this plan. Further, the Coast Guard cannot fully estimate the costs of the transition from the HECs to its NSCs.

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**The Coast Guard Is Developing Required Logistics Plans for the National Security Cutter, but the Key Logistics Plan Has Not Been Completed and Approved, as Required**

The Coast Guard is developing logistics plans to support the NSC as required by its Major Systems Acquisition Manual (MSAM), but the key plan has not been finalized and approved in accordance with the time frames required by the MSAM. The Coast Guard is required to follow the MSAM when designing and producing new assets. Specifically, the MSAM requires a management approach that begins with the identification of deficiencies in overall Coast Guard capabilities and then proceeds through a series of structured phases and decision points to: (1) identify requirements for performance, (2) develop and match these requirements with a proposed solution (e.g., asset needed), (3) demonstrate the feasibility of the proposed asset, and (4) produce the desired asset. The MSAM process provides a number of benefits that have the potential to improve acquisition outcomes, such as ensuring that the new systems and equipment are optimally supportable and the necessary logistics support resources are in place and acquired at an optimal cost. Primarily, it requires event-driven decision making by high-ranking Coast Guard acquisition personnel at a number of key points in an asset's life cycle. At each decision point, or "milestone," the MSAM requires the Coast Guard to prepare certain documents or plans that capture the information needed for decision making and approval of acquisition activities. The MSAM-required documents or plans also guide the transition to a new asset (e.g., NSC) from a legacy asset (e.g., HEC), and the MSAM provides criteria for the Coast Guard to follow when preparing each of these documents.

Required logistics support documents include the Integrated Logistics Support Plan, the Logistics Readiness Review, and the NSC Deployment Plan. The Integrated Logistics Support Plan, which should have been finalized and approved by the time production of the first NSC was started in June 2004, is expected to be completed by October 2009. According to Coast Guard officials, the Coast Guard contracted for the Logistics Readiness Review and the Coast Guard expects to complete the Deployment Plan within the time frames required by the MSAM, which is 2012. Table 2 describes and provides the status of these plans for the NSC acquisition. Appendix I includes a list of the Coast Guard documents

necessary for NSC operations and logistical support, as well as the status of the documents.

**Table 2: Description of Key MSAM-required Logistics Plans**

Logistics plan	Description	Status
Logistics Readiness Review	Assesses the logistics readiness level of a ship, identifies gaps in support, and recommends remediation for identified gaps.	Completed in May 2008. At the time the Coast Guard contracted for this review, it was not an MSAM requirement.
Integrated Logistics Support Plan	Serves as the final master logistics plan used after the asset is fully operational that incorporates any changes identified while the asset undergoes testing with the Interim Support Plan in place.	In progress and expected to be completed by October 2009. According to the MSAM, the final plan should have been completed by the time production was started on the first NSC in June 2004.
Deployment Plan	Ensures that all required personnel and facilities are identified and provided to operate and sustain the new asset when it arrives at the deployed location.	Not yet started, but expected to be completed by 2012, in accordance with MSAM requirements. <sup>a</sup>

Source: GAO analysis of Coast Guard documents.

<sup>a</sup>Coast Guard officials stated that some parts of the Deployment Plan are under development, but the Coast Guard has not begun work on the Deployment Plan itself.

### The Navy’s Logistics Readiness Review Found Some Logistics Plans Are Incomplete

In 2007, the Coast Guard contracted with the Department of the Navy to conduct a Logistics Readiness Review of NSC logistics, which identified gaps in logistics planning and recommended corrective actions that the Coast Guard has begun to address. The Deepwater contractor developed the initial NSC logistics plans, but in 2007, the Coast Guard assumed responsibility for NSC logistical planning because, according to Coast Guard officials, the contractor’s plans were deficient. Coast Guard officials stated that they were concerned that the contractor was not completing NSC logistics plans quickly enough and the plans had insufficient detail. For example, Coast Guard officials said that the contractor’s logistics plans did not include the necessary details, such as how the contractor would support the NSC after it becomes fully operational. As part of the logistics shift from the contractor to the Coast Guard, in 2007, the Coast Guard contracted with the Department of the Navy to assess the logistics readiness level of NSC-Bertholf. While not required by the MSAM at the time the review was contracted for, Coast Guard officials said that the review helped them focus on areas where logistics planning for the NSC



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were lacking. Coast Guard officials added that the review proved to be very useful for logistics planning and, as a result, they revised the MSAM to now require this review before new assets transition to fully operational status.

Published in May 2008, the Logistics Readiness Review focused on nine areas of logistics readiness and identified logistics gaps in those areas. The areas of logistics readiness included the adequacy of the spare parts and supplies available to support NSC-Bertholf, the adequacy of technical support document and plans, and the adequacy of the NSC logistical support facilities, among others. In total, the Navy identified 34 gaps within the 9 logistics areas and developed recommendations on how the Coast Guard could take appropriate action to address those gaps. The Navy identified 18 of the 34 gaps as “high priority,” which means that the gap introduces significant risk to near-term supportability and workarounds either do not exist or they introduce additional risk. For example, the review found that the Coast Guard had not conducted a sufficient number of analyses to determine NSC crew training needs. According to Coast Guard officials, the Coast Guard generally agreed with the Logistic Readiness Review’s findings and has made some progress in addressing the recommendations identified. According to Coast Guard officials, the Coast Guard plans to address 31 of the 34 recommendations. However, according to Coast Guard officials, the Coast Guard has decided not to address three recommendations because the costs of addressing these recommendations outweighed the benefits. For example, the review found that the lifting capability of the crane used to hoist items from the pier onto the NSC was insufficient and made a recommendation to address this deficiency. Coast Guard officials stated the Navy’s finding was based on the projected capability of the crane and countered that its actual lift capabilities are sufficient to meet the needs of the NSC.

Coast Guard officials stated that the NSC logistics transition from the contractor to the Coast Guard either created or increased the significance of several of the gaps identified. For example, under the contractor-supported model, the Coast Guard would have been responsible for a limited amount of NSC maintenance. However, because the Coast Guard now plans to support the NSC with its own staff, it must train personnel and upgrade facilities. Appendix II provides more detail on the review’s findings and the status of the Coast Guard’s progress in implementing the recommendations made to address the gaps identified. Coast Guard officials noted that the Navy does not plan to validate the actions the Coast Guard has taken. Table 3 shows the Coast Guard’s assessment of the status of the 34 gaps identified by the Navy’s review.

**Table 3: Number and Status of the Coast Guard’s Progress in Addressing Navy’s Logistics Readiness Review Recommendations, by Total and High Priority**

<b>Status</b>	<b>Number of recommendations</b>	<b>Number of recommendations pertaining to high priority gaps</b>
Work completed/addressed	6	4
Work in progress	22	12
Work not started	3	2
Recommendation will not be addressed	3	0
<b>Total</b>	<b>34</b>	<b>18</b>

Source: Coast Guard.

According to the Coast Guard officials, the Coast Guard has completed work to address six recommendations, such as revising the NSC Configuration Management Plan, which the Navy found to be inadequate and considered a high-priority gap.<sup>23</sup> Regarding the 25 recommendations in process or not yet started, Coast Guard officials stated the Coast Guard has made some progress in addressing these recommendations. For example, one high-priority gap cited the lack of training for Coast Guard personnel who will be supporting NSC-Bertholf, so, according to Coast Guard officials, the Coast Guard is training these personnel as needs arise. Despite progress, more work needs to be done. For example, the review concluded that facility budgets are insufficient and are not aligned with asset deliveries, and that the Coast Guard has not developed plans for either home ports or facilities for all NSCs.<sup>24</sup> The review recommended developing these documents to address these high-priority gaps. Coast Guard officials stated that the Coast Guard is in the process of addressing the home port recommendation, but has not started to address the facility recommendation.

<sup>23</sup> Configuration management is the process used to understand the important components of an asset and to manage any changes to these components that might be made over the asset’s service life. This process includes identifying components that require management, controlling changes to these components, and recording changes made to components.

<sup>24</sup> A home port is the port at which a vessel is based.

The National Security Cutter’s Integrated Logistics Support Plan Has Not Been Completed and Approved, as Required

The NSC’s Integrated Logistics Support Plan—the key logistics planning document that is to describe the necessary logistics support activities—has not been completed and approved as required by the MSAM. The MSAM requires that this plan assign responsibility to a Coast Guard unit for the planning of each logistics area and establish a schedule with time frames for completing these activities. According to the MSAM, each of the 10 logistics areas should have a section in the Integrated Logistics Support Plan that identifies and describes the detailed documents the Coast Guard intends to use to support the project in each logistics area with the details to be provided separately. Moreover, the plan is to identify what details will be provided, who will provide them, and when. Table 4 describes the 10 logistics areas.

**Table 4: Coast Guard Logistics Areas**

Logistics area	Description
1 Design interface	Determines the inherent supportability of a system. Purpose is to: (1) ensure that logistical support considerations are a part of the design process; and (2) ensure that changes in a system design during the various design and construction phases are reviewed for impact on logistical support.
2 Maintenance planning	The analytical methodology used to establish the maintenance philosophy of a system; answers questions such as: What can go wrong? Who will fix it? Where will it be fixed? How will it be fixed? And how often will it need to be fixed?
3 Manpower and personnel	The identification and acquisition of personnel (military and civilian) with skills and grades required to operate, support, and maintain a system over its life cycle.
4 Supply support	All the management actions, procedures, and techniques necessary to acquire, catalog, receive, store, transfer, issue and dispose of secondary items (piece and repair parts below the major system level).
5 Support equipment	All equipment required to support the operation and maintenance of a system.
6 Technical data	The information needed to translate system and equipment design requirements into discrete engineering and logistics considerations, such as manual and maintenance procedures.
7 Training and training support	The processes, procedures, techniques, training devices, equipment, and materials used by personnel to operate and support a system throughout its life cycle.
8 Computer resources support	The internal and external facilities, hardware, software, personnel, and other resources needed to support software intensive systems.

Logistics area	Description
9 Packaging, handling, storage, and transportation	The requirements, resources, processes, procedures, design considerations, and methods necessary to ensure that all systems, equipment, and support items are preserved, packaged, handled, stored, and transported properly.
10 Facilities	The real property assets required for the support of a system; includes conducting studies that define facilities and facility improvement, locations, space needs, equipment, and others.

Source: GAO analysis of Coast Guard documents.

According to the MSAM, the Coast Guard is to prepare and approve the Integrated Logistics Support Plan before production is started on the first asset in a class. Although the NSC acquisition passed this phase in June 2004, as of May 2009, the Coast Guard has not completed and approved this plan. Coast Guard officials said that the Coast Guard initially required the contractor to develop the Integrated Logistics Support Plan, but when the Coast Guard assumed responsibility for NSC logistics in 2007, it determined that the contractor’s plan did not meet the Coast Guard’s needs and began to update it. According to Coast Guard officials, they expect to complete the plan by October 2009.

To meet the near term logistics needs of the NSC and guide logistics planning until the Coast Guard completes the Integrated Logistics Support Plan, it developed an Interim Support Plan. According to the Coast Guard, the interim plan is to provide information about how the Coast Guard would sustain NSC-Bertholf and to identify the personnel responsible for maintaining the NSC. Our review of the Interim Support Plan, however, found that while the plan assigns responsibility to a Coast Guard unit for activities in all 10 logistics areas, it does not provide the level of detail that would be required by the MSAM for an NSC Integrated Logistics Support Plan. In particular, as shown in table 5, we found that 5 of the 10 areas covered in the Interim Support Plan do not contain a planning section that describes the detailed documents the Coast Guard plans to use to support the NSC in each logistics area. In addition, none of the 10 logistics areas contain detailed time frames for when the planning information is to be developed and finalized. For example, while the interim plan makes note of the “Training” logistics area, the plan does not contain any dates to guide the Coast Guard’s planning of this area. Further, five areas, such as “Maintenance Planning” and “Supply Support” do not contain a planning section and, therefore, do not have required time frames for completing documents.

**Table 5: Information on the Coast Guard’s Interim Support Plan’s Compliance with MSAM Requirements**

<b>Logistics area</b>	<b>Responsibility assigned to appropriate Coast Guard offices</b>	<b>Planning section present in the Interim Support Plan</b>	<b>Documentation of time frames present in the Interim Support Plan</b>
Maintenance planning	X	-	-
Supply support	X	-	-
Training	X	X	-
Support and test equipment	X	-	-
Manpower and personnel	X	X	-
Packaging, handling, storage, and transportation	X	X	-
Facilities	X	X	-
Computer resources support	X	-	-
Technical data	X	X	-
Design interface	X	-	-
<b>Totals</b>	<b>10</b>	<b>5</b>	<b>0</b>

Source: GAO analysis of Coast Guard data.

According to Coast Guard officials, while the Interim Support Plan was developed using the MSAM-mandated Integrated Logistics Support Plan structure as a guide, they acknowledged that the interim plan does not meet MSAM requirements. Further, Coast Guard officials did not commit to including all the required items, such as details of documents to be used and time frames for completing these documents, when revising the final Integrated Logistics Support Plan because they are still in the process of determining how to proceed with finalizing the plan. Including these details and time frames for the completion of logistics planning documents could strengthen the Coast Guard’s efforts to support the NSC in the 10 logistics areas by providing a roadmap to guide its personnel regarding actions to take and when to take them. For example, the interim plan lacks MSAM-required details on maintenance planning and supply support—which are critical in determining the number of people and supplies for supporting the NSC. In addition, providing details and time frames for the other logistics areas, as noted in table 5, would help ensure such actions are conducted in accordance with management’s directives and better

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The Coast Guard Continues to Develop Required Components of the National Security Cutter Deployment Plan

position the Coast Guard to more effectively support the NSCs as they are deployed.

The Coast Guard has made some progress in developing a deployment plan that is to address the logistics transition from the HEC to the NSC and some of the costs of this transition and expects to complete this plan by 2012, as required by the MSAM. Specifically, the MSAM requires the Coast Guard to develop an asset deployment plan that includes items such as the timing of deliveries, the decommissioning of legacy assets, and the selection of locations where the new assets will be based. In addition, the Deployment Plan is to identify any costs that will be incurred as part of (1) NSC deployment, (2) new or modified facilities requirements, (3) staffing issues, and (4) plans for disposal of HECs. For the NSC, the MSAM requires an approved plan be in place by 2012, prior to full production. The Coast Guard anticipates it will complete the NSC Deployment Plan to satisfy this requirement within the time frame established by the MSAM. Some parts of the Deployment Plan currently under development include the following:

- **Delivery schedule:** The Coast Guard has developed an NSC delivery schedule. The first NSC was delivered in 2008 and the final NSC is expected to be delivered in 2017.
- **Home port locations:** According to Coast Guard officials, the Coast Guard plans to base the first three NSCs in Alameda, California and continues to develop home port plans for the other five cutters and determine the facilities upgrades needed at these ports. According to the MSAM, both the home port and facility plans are to be completed by 2012, and Coast Guard officials stated the Coast Guard is on track to meet this requirement for both plans. Specifically, Coast Guard officials stated that the Coast Guard expects to decide the home port locations for the fourth through sixth NSCs by the end of fiscal year 2009, and it plans to decide the home port locations for the seventh and eighth NSCs by fiscal year 2011. According to Coast Guard officials, facility planning is to begin after home port locations are determined.
- **Decommissioning Schedule:** Coast Guard officials stated that they continue to work on a decommissioning schedule and have determined that the Coast Guard will decommission HEC-Hamilton shortly after NSC-Bertholf becomes fully operational. According to Coast Guard officials, the order in which the other HECs are to be decommissioned is to be determined in 2009, although the order may change after the completion of an analysis of the condition of HECs. A

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critical component of this analysis is an assessment of HEC hulls. According to Coast Guard officials, saltwater corrodes a cutter's hull over time, and the studies are to determine the extent to which the hulls are degraded on HECs. Studies of two HEC hulls have been completed, and the Coast Guard expects to complete five more in 2009, and then complete the remaining five by 2011. Ultimately, the Coast Guard plans to use these studies to inform its decision about which HECs to decommission first and which to sustain longer. According to Coast Guard officials, the time frames the Coast Guard develops to implement its HEC sustainment plan may also impact the decommissioning schedule, as the Coast Guard may delay the decommissioning of an HEC until it completes sustainment upgrades on another HEC to minimize any operational gaps. To further minimize any operational gaps, Coast Guard plans to schedule HEC decommissioning dates to coincide with NSCs becoming operational.

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## Coast Guard Continues to Develop Logistics Transition Cost Estimates

The Coast Guard has incurred some costs and developed cost estimates related to the logistics transition from the HEC to the NSC, such as NSC maintenance personnel salaries at Alameda, but other costs related to this transition, such as facilities upgrades for ports other than Alameda, cannot be fully determined at this time. According to Coast Guard officials, the primary cost drivers of the logistics transition are: (1) maintenance planning, (2) maintenance training, (3) facilities upgrades, and (4) maintenance execution. These officials stated that the cost drivers they identified contained both transition and life-cycle logistics costs, and that it was difficult to differentiate between these costs. For example, Coast Guard officials stated that the maintenance execution cost driver—the actions taken to maintain an asset—does not distinguish between transition and life-cycle costs. A discussion of the transition component of each cost driver, the costs incurred to date, and any estimated future costs follows.

## Maintenance Planning

Coast Guard officials said that the first cost driver for the logistics transition from HECs to NSCs is the development of maintenance planning documents and schedules. According to Coast Guard officials, most maintenance planning is complete, and as of May 2009, the Coast Guard has spent an estimated \$2.5 million on these efforts. More specifically, the Coast Guard spent about \$1.1 million on contracting, primarily for maintenance plan development and management, while the remaining \$1.4 million represents the amount paid to Coast Guard personnel working on maintenance planning. Coast Guard officials estimated that as of May 2009, the Coast Guard had completed at least 90 percent of the needed NSC maintenance planning.

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## Maintenance Training

Coast Guard officials stated that the second cost driver for the logistics transition from HECs to NSCs is the preparation of the crew and shore-side maintenance personnel to support the NSC. As of June 2008, the Coast Guard estimated that it needed about \$7 million for training. According to Coast Guard officials, the Coast Guard continues to develop training programs and further work remains to be done. For example, the Logistics Readiness Review recommended completing additional training analyses on 30 equipment systems unique to the NSC, but Coast Guard officials stated that as of February 2009, only 4 analyses of these systems were under way. Additionally, the Coast Guard has not decided the extent to which it will develop its own training courses—which require more upfront costs—as opposed to contracting with equipment manufacturers for the training. The costs incurred for this driver as well as the overall logistics transition costs may increase if the Coast Guard decides to develop more training.

## Facility Upgrades

Coast Guard officials told us that the third cost driver for the logistics transition from HECs to NSCs includes the modifications to the port and its associated buildings to accommodate the new NSCs. By June 2008, the Coast Guard had completed about \$12.5 million of the facility upgrades needed at the Alameda, California port where at least three NSCs are to be based. These modifications included pier upgrades to accommodate the larger NSC as well as dredging the channel to accommodate the NSC's deeper draft.<sup>25</sup> Because of these logistics improvements, the Coast Guard port at Alameda can now accommodate NSC-Bertholf, as shown in figure 5.

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<sup>25</sup> Draft is the depth of water needed to float the vessel. The draft of the NSC is 22 feet, compared to the 19 foot draft of an HEC.



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**Figure 5: NSC-Bertholf Docked at the Pier, Alameda, California**



Source: GAO.

While certain facility upgrades have been completed in Alameda, other upgrades have not been completed. For example, the Coast Guard believes it will need a building to house those crew members who are part of the new rotational crewing concept for the NSC, but as of June 2009, construction of the estimated \$22.4 million facility has not started. According to Coast Guard officials, the Coast Guard also has not begun facility upgrades at other locations because the Coast Guard has not finalized the NSC Home Port Plan. Coast Guard officials stated that the Coast Guard expects to decide the home port locations for the fourth through sixth NSCs by the end of fiscal year 2009, and it plans to decide the home port locations for the seventh and eighth NSCs by fiscal year 2011. Coast Guard officials stated that the Coast Guard may select home ports for NSCs in locations that could require more significant upgrades than Alameda, an outcome that would increase costs.

## Maintenance Execution

Coast Guard officials said that the fourth cost driver for the logistics transition from HECs to NSCs is maintenance activities to support the NSCs and include (1) the cost of purchasing agreements and other commercial contracts to supply and maintain the NSCs and (2) salaries for Coast Guard shore-side maintenance personnel. According to Coast Guard officials, as of May 2009, the Coast Guard had spent \$550,000 on

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purchasing agreements it developed with equipment manufacturers to help bridge the gap between contractor-supported and Coast Guard-supported logistics and plans to allocate \$5.6 million for these agreements from 2008 through 2011. Coast Guard officials stated the Coast Guard has used these agreements to purchase parts and extend equipment warranties, among other things. Additionally, Coast Guard officials stated that the Coast Guard plans to enter into other commercial contracts for NSC maintenance from 2008 through 2011, but cannot estimate the costs of those contracts because it does not have historical maintenance data on the NSC's new equipment that are needed to estimate the frequency of equipment failures and the costs of repairing them. Coast Guard officials stated that the Coast Guard currently has a 5-year study underway to develop more accurate maintenance cost estimates.

Regarding maintenance personnel salaries, Coast Guard officials said that separating the personnel costs for the logistics transition from HECs to NSCs is difficult because maintenance execution costs are determined based on the service life of the cutters and transition costs are not accounted for separately. As such, these officials could not estimate the maintenance personnel cost component of the logistics transition. Although the Coast Guard has estimated shore side maintenance costs for NSCs that are to use Alameda as a home port, Coast Guard officials stated that they have not determined how quickly the support needs for HECs will diminish as NSCs begin conducting missions and HECs are decommissioned. With this in mind, Coast Guard officials stated that the Coast Guard plans to phase out personnel positions currently dedicated to supporting HECs and replace them with personnel dedicated to support NSCs. According to Coast Guard officials, the Coast Guard currently has 79 maintenance personnel positions in Alameda to support four HECs and could not estimate the cost for these positions. These officials stated the Coast Guard has added 11 NSC maintenance positions in Alameda, at a cost of \$940,000 per year, and estimate that it will need 108 additional maintenance personnel to support the first three NSCs at a cost of about \$9 million per year for all three combined. Furthermore, Coast Guard officials stated that they expect the maintenance execution cost estimates to change after the Coast Guard completes a study to determine the number of shore-side personnel needed to support the NSC—the lack of that study was identified in the Logistics Readiness Review as high priority.

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## Conclusions

The NSC, the first cutter class delivered to the Coast Guard under the Deepwater program, is to be instrumental in carrying out the Coast Guard's missions as it replaces the aging and increasingly unreliable HEC class. Although the Coast Guard assumed responsibility for NSC logistical planning in 2007 because it believed that the contractor's plans did not contain sufficient details, the Coast Guard has yet to complete the Integrated Logistics Support Plan, as required by the MSAM. The Coast Guard has developed an interim support plan to guide logistics planning for the NSC until the Integrated Logistics Support Plan is finalized, but the interim plan lacks MSAM-required details, such as maintenance planning and supply support that are critical in determining the number of people and supplies the Coast Guard will need to support the NSC. Further, while the Coast Guard expects to complete the Integrated Logistics Support Plan by October 2009, the plan may not include the required details of logistics support documents to be used and time frames for completing them because the Coast Guard is still determining how to proceed with finalizing the plan and did not commit to including these details. Identifying these details and time frames for the completion of logistics planning documents could strengthen the Coast Guard's efforts to support the NSC in the 10 logistics areas by providing a roadmap to guide its personnel of actions to take and when to take them, better position the Coast Guard to more effectively transition to the NSC, better ensure that the Coast Guard's cost estimates are reasonable, and reduce uncertainties for the Coast Guard (which must budget for such costs in advance) and Congress (which must appropriate the funds).

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## Recommendation for Executive Action

To meet MSAM requirements and aid the Coast Guard in making operational decisions, GAO recommends that the Commandant of the Coast Guard ensure that as the Coast Guard finalizes the Integrated Logistics Support Plan for the NSC, that the plan includes the required logistics support documents to be used and the time frames for completing them.

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## Agency Comments

In June 2009, we requested comments on a draft of this report from the Department of Homeland Security and the Coast Guard. The Coast Guard provided technical comments, which we have incorporated into the report, as appropriate. In addition to the technical comments, the Department of Homeland Security and the Coast Guard jointly provided an official letter for inclusion in this report. In the letter, the agencies noted that they generally concur with our findings and recommendation. A copy of this letter can be seen in appendix III.

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We are providing copies of this report to the Secretary of DHS, the Commandant of the U.S. Coast Guard, and interested congressional committees. In addition, the report will also be made available at no charge on GAO's Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-9610, or [caldwells@gao.gov](mailto:caldwells@gao.gov). Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.

A handwritten signature in black ink, appearing to read "Stephen L. Caldwell". The signature is fluid and cursive, with a large initial "S" and a checkmark-like flourish at the end.

Stephen L. Caldwell  
Director, Homeland Security and Justice Issues

# Appendix I: National Security Cutter Operations and Logistics Documents

This appendix lists the Coast Guard’s National Security Cutter (NSC) operations and logistics documents that are incomplete or under development. The Coast Guard uses many documents to guide the acquisition and logistical support of its assets. The Coast Guard documents relative to the NSC, their expected completion dates, and purpose are listed in table 6.

**Table 6: List of NSC Operations and Logistics Documents/Analyses and Expected Completion Dates**

Document/analysis	Expected completion date	Purpose
Small Boats Concept of Operations	Spring 2009	Outlines the specific uses and missions of small boats integrated with the NSC.
Fleet Mix Analysis	Summer 2009	Determines the appropriate number of Deepwater assets, including NSCs.
Small Boats Operational Requirements Document	Summer 2009	Provides the performance specifications of small boats.
NSC Test and Evaluation Master Plan	July 2009	Serves as the “top-level” planning document for all NSC testing and evaluation. Guides verification of technical performance parameters, operational effectiveness, and operational suitability.
NSC Logistics Support Plan	October 2009	Serves as the master logistic support planning document and is an integral part of the total project planning effort. Describes the necessary logistics support activities including assigning responsibility for those activities and establishing the schedule for completing those activities.
Project Management Plan	October 2009	Establishes procedures for the overall management of the approved acquisition project. Provides the framework to define the activities/tasking, responsibilities, and the sequence of events, and is the Project Manager’s blueprint for project management.
Mission Enhancement Project— Plus Plan	2009	Documents High Endurance Cutter sustainment process that will replace aging and obsolete systems to reduce maintenance costs and operational days lost because of unplanned maintenance.
HEC Decommissioning Schedule	Late 2009	Determines the order in which the Coast Guard will decommission HECs.
Crew Rotational Concept Concept of Operations	2010-2011	Provides specifics on how the Coast Guard will implement rotational crewing. Needed to estimate the number of shore-side NSC maintenance personnel—a key cost of the maintenance transition.
Unmanned Aircraft System Study	2010	Document which identifies the most effective unmanned aircraft system to operate off the Coast Guard’s National Security Cutter.
High Endurance Cutter Hull Inspections	2011	Provides information to support the HEC decommissioning schedule.
NSC Home Port Plan	2011a	Determines home port for each of the eight NSCs.
Deployment Plan	2012	Addresses all areas of asset deployment related to the acquisition. Ensures that all required resources (e.g., personnel and facilities) are identified and provided to operate and sustain the new asset or capability when it arrives at the deployed location.

**Appendix I: National Security Cutter  
Operations and Logistics Documents**

<b>Document/analysis</b>	<b>Expected completion date</b>	<b>Purpose</b>
Integrated Training Plan	No estimate available	Formalizes both NSC crew and shore-side personnel training curricula.
Manpower Requirements Analysis for shore-side commands	No estimate available	Details the shore-side requirements—including billets—needed for NSC maintenance. Completion is dependent on the crew rotational concept (CRC) concept of operations (CONOPS).
Class Facilities Plan	No estimate available	Determines what changes are necessary in selected homeports to accommodate NSCs. Completion is dependent on the NSC Home Port Plan.

Source: GAO Analysis of Coast Guard information.

<sup>a</sup>Coast Guard officials stated that the first three NSCs will be located in Alameda, California. According to these officials, the Coast Guard expects to decide the home port locations for the fourth through sixth NSCs by the end of fiscal year 2009, and it plans to decide the home port locations for the seventh and eighth NSCs by fiscal year 2011.

# Appendix II: Logistics Readiness Review Findings and the Coast Guard's Efforts to Address Identified Gaps

This appendix describes the results of the Navy's Logistics Readiness Review (LRR) and the Coast Guard's efforts to address identified gaps, as of May 2009. The MSAM requires the completion of a LRR as a part of the acquisition process. The Coast Guard contracted with the Department of the Navy to conduct a LRR, which assessed the adequacy of the Coast Guard's readiness to support the NSC based on logistics plans provided by the contractor. Specifically, the LRR determined the logistics readiness level of NSC-Bertholf, identified gaps in support, assessed potential impacts on mission performance, and recommended remediation for identified gaps. This appendix provides details on the review's findings and the status of the recommendations made to address the gaps identified.

## Navy Review of National Security Cutter Logistics Areas Identified Gaps

The LRR focused on nine areas of logistics readiness, including supply support, technical documents, facilities, and aviation, among others.<sup>1</sup> Table 7 provides the review's findings in the nine areas.

**Table 7: The Navy's Logistics Readiness Review Assessment of NSC Logistics Areas, as of May 2008**

Logistics areas	Assessment of progress made	Number of gaps	Number of gaps that introduce significant risk <sup>a</sup>
1 Support equipment	Inoperative	2	1
2 Configuration management	The working level details in the draft Configuration Management Plan are inadequate to support the NSC	1	1
3 Capstone documentation	Capstone documents need to be updated, or in some cases developed	4	3
4 Manpower, personnel, and training	Minor Problems	6	3
5 Aviation and small boats	Minor Problems (aviation)/moderate problems (small boats)	3	0

<sup>1</sup> At the time Coast Guard contracted for the NSC LRR, it was not an MSAM requirement.

**Appendix II: Logistics Readiness Review  
Findings and the Coast Guard’s Efforts to  
Address Identified Gaps**

<b>Logistics areas</b>	<b>Assessment of progress made</b>	<b>Number of gaps</b>	<b>Number of gaps that introduce significant risk<sup>a</sup></b>
6 Technical documentation	Moderate problems	6	4
7 Supply support	Moderate problems	5	5
8 Facilities	Moderate problems	6	0
9 Maintenance planning	Not reviewed <sup>b</sup>	1	1
<b>Total</b>		<b>34</b>	<b>18</b>

Source: GAO analysis of data compiled by the U.S. Navy.

<sup>a</sup>The Logistics Readiness Review identified some gaps as “Priority 1,” which the Navy defined as the gaps that introduce significant risk to near-term supportability and workarounds either do not exist or introduce significant risk.

<sup>b</sup>Prior to the start of the Navy’s review, the Coast Guard determined that the maintenance procedures delivered by the contractor were deficient. As a result, the Navy did not review this logistics area and assessed it has a gap that introduced significant risk to logistics readiness.

The LRR identified 34 gaps within the 9 logistics. Details on the Navy’s assessment for each of these logistics areas are as follows:

**Support Equipment**

Support equipment is all the required equipment needed to support the operation and maintenance of a system, including: tools; ground support equipment such as generators and service carts; and calibration equipment, among others. Systems include such areas as propellers, guns, and the rudder. A review of 197 NSC systems identified incomplete and inconsistent support equipment documentation. For example, 22 percent of the items needed to support the NSC systems had complete support equipment data while the remaining 78 percent had either partial or no data. Additionally, numerous support equipment items were referenced multiple times for the same systems. For example, a system that should require only one 2,000 pound chain hoist had documents that listed a 2,000 pound chain hoist 15 times.

**Configuration Management**

Configuration management is the process used to understand the important components of an asset and to manage any changes to these components that might be made over the asset’s service life. This process includes identifying components that require management; controlling changes to these components; and recording changes made to components. The LRR concluded that there was limited capacity within the Coast Guard to address near-term configuration management processes and that the working-level details in the draft configuration management plan were not adequate to support the NSC. For example, the



Navy identified more than 13,700 NSC equipment and system records from databases and site inspections, but the contractor's databases included only 5,600 records.

#### Capstone Documentation

The Navy identified NSC Capstone documents, which are the documents normally required for major milestone decisions. The Navy found that several logistics documents needed to be updated, such as the Configuration Management Plan and the Interim Logistics Support Plan. The Configuration Management Plan provides the process the Coast Guard uses to control changes to NSC components, while the Logistics Support Plan serves as the master logistics support document. Other documents—including the Home Port Plan and Facilities Plan—need to be developed. The Home Port Plan is to outline where all eight NSCs are to be permanently stationed and the Facilities Plan is to describe the necessary changes to those homeports needed to accommodate NSCs.

#### Manpower, Personnel, and Training

Manpower and personnel is the identification and acquisition of personnel (military and civilian) with skills and grades required to operate, support, and maintain a system over its life cycle. Training is the processes, procedures, techniques, training devices, equipment, and materials used by personnel to operate and support a system throughout its life cycle. Overall, the Navy found that this area had minor problems, but identified some areas of concern. For example, the personnel evaluation identified several administrative findings the Coast Guard needed to resolve, including filling three vacant NSC-Bertholf crew positions. Additionally, the training evaluation found that NSC training requirements are “significantly greater” than for legacy cutters and determined that 137 systems require additional formal training. For example, the LRR found that the average number of training days needed for an HEC crewmember is 23, but NSC crew members need an average of 61 days of training.

#### Aviation and Small Boats

The aviation logistics area was found to have minor problems and the small boats area was categorized as having moderate problems. The review identified two aviation Priority 3 gaps and found, for example, that the wind indicating system pilots use to land helicopters on the NSC was inadequate. According to the LRR, the NSC does not have a system certified by the Navy, but Coast Guard officials stated that the Coast Guard has received interim approval from the Navy to use the current system. The review also found that the Coast Guard had not made a final decision regarding the small boat package required for the NSC. The review recommended conducting a small boat LRR once the Coast Guard decided on the small boat package.

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**Technical documentation**

Technical documentation is the information needed to translate system and equipment design requirements into discrete engineering and logistics considerations, such as manual and maintenance procedures. The Navy compared technical documentation data from different Coast Guard sources and found that there were a number of technical documentation discrepancies. The baseline documentation lists were inconsistent and did not provide the desired level of logistics information as compared with documentation found on other vessel classes. For example, the review identified about 300 document duplications and discrepancies in Coast Guard data. Moreover, the review determined that the Coast Guard was unable to effectively identify and track these documents.

**Supply support**

Supply support is all the management actions, procedures, and techniques necessary to acquire, catalog, receive, store, transfer, issue and dispose of secondary items (piece and repair parts below the major system level). The review found that the contractor did not include maintenance requirements in the spares determination process; out of the 316 items the Navy reviewed, 55 items had sufficient spares ordered, 127 items had insufficient spares, and 134 items had either incomplete or no data.

**Facilities**

The review also examined all planned, ongoing, and completed shoreside facility projects to gauge the potential impact on the delivery of NSC-Bertholf to the Coast Guard's Alameda, California location. The review found numerous logistics gaps—such as an expired certification for a crane used to maintain NSC small boats—but none introduced significant risk to the near-term supportability of the NSC.

**Maintenance planning**

Maintenance planning is the analytical methodology used to establish the maintenance philosophy of a system and answers questions such as: What can go wrong? Who will fix it? Where will be fixed? How will it be fixed? And how often will it need to be fixed? The LRR for the NSC did not review the detailed maintenance procedures needed to support the hull, mechanical, electrical, and communications systems because Coast Guard officials told the Navy that the procedures in place at the time of the LRR did not contain the information needed. The review identified the inadequacy of maintenance procedures as a significant gap.

The Coast Guard Reports Making Progress in Addressing Gaps Identified by the Logistics Readiness Review

The Coast Guard has addressed some of the gaps identified by the Logistics Readiness Review. The Navy categorized the gaps it identified in the LRR and developed recommendations to address those gaps. The Navy ranked the gaps it identified in the LRR as Priority 1, 2, or 3. Priority 1 gaps are defined as those that introduce significant risk to near-term supportability, and workarounds either do not exist or introduce additional risk. Priority 2 gaps do not introduce significant risk to near-term supportability, and workarounds are likely to increase the cost or reduce the efficiency of maintenance or operations. Priority 3 gaps do not introduce significant risk to near-term supportability, and workarounds exist that do not introduce additional risk. Of the 34 gaps, the Navy identified 18 as Priority 1, 8 as Priority 2, and 8 as Priority 3. As of May 2009, Coast Guard officials stated that the Coast Guard had addressed 7 recommendations (3 of which pertain to priority 1 gaps), was in the process of addressing 21 (13 of which pertain to priority 1 gaps), had not started 3 (2 of which pertain to priority 1 gaps), and had decided not to address 3 gaps (none of which pertain to priority 1 gaps). Table 8 provides a list of the 34 gaps the LRR identified and the progress the Coast Guard has made in addressing these gaps.

**Table 8: NSC Logistics Readiness Review Assessment of Logistics Areas and the Coast Guard's Reported Progress**

Logistics Gap	Status
<b>Priority 1 Gaps</b>	
NSC-Bertholf will not receive Navy standard Engineering Operational Sequencing System (EOSSS) documents.	Completed
Training requirements requested in CG-1 resource proposals require validation.	Completed
Limited capacity to address near-term configuration management processes and status accounting.	Completed
Hull, Maintenance and Electrical and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) maintenance procedures inadequate.	Completed
NSC-Bertholf will not receive Navy standard Combat Systems Operational Sequencing System (CCOSS) documents.	In progress
No locally prepared combat systems operating procedures.	In progress
Procurement of recommended C4ISR spares incomplete.	In progress
Minimal deep insurance spares.	In progress
Baseline technical documentation lists are inconsistent.	In progress
Support equipment documentation is incomplete and inconsistent.	In progress
No integrated training plan captures non-billet specific or shore support training requirements.	In progress
There are NSC Class-unique systems that require a front end analysis.	In progress
Home port requirements continue to evolve; no home port plan for hulls beyond the first three.	In progress
Transition to Coast Guard support of C4ISR suite.	In progress

**Appendix II: Logistics Readiness Review  
Findings and the Coast Guard's Efforts to  
Address Identified Gaps**

<b>Logistics Gap</b>	<b>Status</b>
Original Source, Maintenance, and Recoverability coding should be updated.	In progress
No formal Provisioning Technical Documentation for C4ISR.	In progress
Facility requirements are not definitive and continue to evolve.	Not started
Manpower Requirements Analysis for the shore commands is not complete.	Not started
<b>Priority 2 Gaps</b>	
Alameda port security issues.	Completed
Support equipment requirements for the LM2500 engine are unknown.	Completed
Naval Engineering Support Unit is scheduled to receive 25 additional billets over next 3 fiscal years and may need office space.	In progress
No facility currently exists to store shore power cable reels at Alameda.	In progress
No plan currently exists to maintain the new shore power infrastructure.	In progress
Certification of overhead crane expired.	Will not be addressed
A comprehensive list of Coast Guard-required operations and tactical documentation is unavailable.	Will not be addressed
Alameda pier side crane lifting capability is insufficient.	Will not be addressed
<b>Priority 3 Gaps</b>	
Manpower requirements for crew need to be revised. <sup>a</sup>	In progress
Level III analysis will need to be revised once a new Front End Analysis (FEA) is performed. <sup>a</sup>	In progress
No logistical support for Aircraft/Shipboard Integrated Secure and Traverse System.	In progress
Wind Measuring and Indicating System is not a Naval Air Systems Command certified system.	In progress
Logistics Support Plan is incomplete.	In progress
Training and simulation support not aligned with watch standards qualification system and EOSS/CSOSS.	In progress
Damage control repair locker inventory process is inefficient.	In progress
No LRR for the Long Range Interceptor small boat.	Not started

Source: Coast Guard.

<sup>a</sup>The Navy considered these gaps to be Priority 3, but the Coast Guard recategorized them as Priority 1.

# Appendix III: Comments from the Department of Homeland Security

U.S. Department of Homeland Security  
Washington, DC 20528



**Homeland  
Security**

July 10, 2009

Mr. Stephen Caldwell  
Director  
Homeland Security and Justice Issues  
United States Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Dear Mr. Caldwell:

Thank you for the opportunity to review and comment on the Government Accountability Office's (GAO's) Draft Report GAO-09-497, entitled *Coast Guard Better Logistics Planning Needed to Aid Operational Decisions Related to the Deployment of the National Security Cutter and Its Support Assets*.

The United States Coast Guard (USCG) remains grateful for the work GAO has done to bring attention to issues within the Coast Guard's acquisition of the National Security Cutter (NSC) and concurs with the findings of this report. The commitment the GAO has towards making the Deepwater program successful is appreciated and the Coast Guard values the opinion of the GAO. The Coast Guard benefits from this oversight and will use it to ensure improvement to our acquisition program in the future. Thank you for considering the Coast Guard's comments on these very important issues.

**Recommendation:** "To meet MSAM requirements and aid the Coast Guard in making operational decisions, GAO recommends that the Commandant of the Coast Guard ensure that as the Coast Guard finalizes the Integrated Logistics Support Plan for the NSC, that the plan includes the required logistics support documents to be used and the time frames for completing them."

**Response:** Concur – the USCG agrees with the Recommendation and is in the process of finalizing the NSC Integrated Logistics Support Plan.

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**Appendix III: Comments from the Department  
of Homeland Security**

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Thank you again for the opportunity to comment on this Draft Report and we look forward to working with you on future Homeland Security issues.

Sincerely,



Gerald E. Levine  
Director  
Departmental GAO/OIG Liaison Office

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Stephen L. Caldwell (202) 512-9610 or [caldwells@gao.gov](mailto:caldwells@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Christopher Conrad, Assistant Director, and Ellen Wolfe, Analyst-in-Charge, managed this review. Christoph Hoashi-Erhardt and Paul Hobart made significant contributions to the work. Geoffrey Hamilton provided legal and regulatory support; Adam Vogt provided assistance in report preparation; Michele Fejfar assisted with design, methodology, and data analysis; and Karen Burke helped develop the report's graphics.

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# Related GAO Products

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*Coast Guard: As Deepwater Systems Integrator, Coast Guard Is Reassessing Costs and Capabilities but Lags in Applying Its Disciplined Acquisition Approach.* [GAO-09-682](#). Washington, D.C.: July 14, 2009.

*Coast Guard: Observations on the Fiscal Year 2010 Budget and Related Performance and Management Challenges.* [GAO-09-810T](#). Washington, D.C.: July 7, 24, 2009.

*Coast Guard: Observations on the Genesis and Progress of the Service's Modernization Program.* [GAO-09-530R](#). Washington, D.C.: June 24, 2009.

*Coast Guard: Update on Deepwater Program Management, Cost, and Acquisition Workforce.* [GAO-09-620T](#). Washington, D.C.: April 22, 2009.

*Coast Guard: Change in Course Improves Deepwater Management and Oversight, but Outcome Still Uncertain.* [GAO-08-745](#). Washington D.C.: June 24, 2008.

*Coast Guard: Strategies for Mitigating the Loss of Patrol Boats Are Achieving Results in the Near Term, but They Come at a Cost and Longer Term Sustainability Is Unknown.* [GAO-08-660](#). Washington, D.C.: June 23, 2008.

*Status of Selected Aspects of the Coast Guard's Deepwater Program.* [GAO-08-270R](#). Washington, D.C.: March 11, 2008.

*Coast Guard: Observations on the Fiscal Year 2009 Budget, Recent Performance, and Related Challenges.* [GAO-08-494T](#). Washington, D.C.: March 6, 2008.

*Coast Guard: Deepwater Program Management Initiatives and Key Homeland Security Missions.* [GAO-08-531T](#). Washington, D.C.: March 5, 2008.

*Coast Guard: Challenges Affecting Deepwater Asset Deployment and Management and Efforts to Address Them.* [GAO-07-874](#). Washington, D.C.: June 18, 2007.

*Coast Guard: Status of Efforts to Improve Deepwater Program Management and Address Operational Challenges.* [GAO-07-575T](#). Washington, D.C.: March 8, 2007.



*Coast Guard: Preliminary Observations on Deepwater Program Assets and Management Challenges.* [GAO-07-446T](#). Washington, D.C.: February 15, 2007.

*Coast Guard: Coast Guard Efforts to Improve Management and Address Operational Challenges in the Deepwater Program.* [GAO-07-460T](#). Washington, D.C.: February 14, 2007.

*Homeland Security: Observations on the Department of Homeland Security's Acquisition Organization and on the Coast Guard's Deepwater Program.* [GAO-07-453T](#). Washington, D.C.: February 8, 2007.

*Coast Guard: Status of Deepwater Fast Response Cutter Design Efforts.* [GAO-06-764](#). Washington, D.C.: June 23, 2006.

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*Coast Guard: Progress Being Made on Addressing Deepwater Legacy Asset Condition Issues and Program Management, but Acquisition Challenges Remain.* [GAO-05-757](#). Washington, D.C.: July 22, 2005.

*Coast Guard: Preliminary Observations on the Condition of Deepwater Legacy Assets and Acquisition Management Challenges.* [GAO-05-651T](#). Washington, D.C.: June 21, 2005.

*Coast Guard: Preliminary Observations on the Condition of Deepwater Legacy Assets and Acquisition Management Challenges.* [GAO-05-307T](#). Washington, D.C.: April 20, 2005.

*Coast Guard: Deepwater Program Acquisition Schedule Update Needed.* [GAO-04-695](#). Washington, D.C.: June 14, 2004.

*Coast Guard: Progress Being Made on Deepwater Project, but Risks Remain.* [GAO-01-564](#). Washington, D.C.: May 2, 2001.

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