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COAST GUARD

**Status of Efforts to Improve
Deepwater Program
Management and Address
Operational Challenges**

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Homeland Security and Justice Issues





Highlights of [GAO-07-575T](#), a report to before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, U.S. House of Representatives

Why GAO Did This Study

The Coast Guard's Deepwater program is a 25-year, \$24 billion plan to replace or modernize its fleet of vessels and aircraft. While there is widespread acknowledgment that many of the Coast Guard's aging assets need replacement or renovation, concerns exist about the acquisition approach the Coast Guard adopted in launching the Deepwater program. From the outset, GAO has expressed concern about the risks involved with the Coast Guard's acquisition strategy, and continues to review Deepwater program management.

This statement discusses (1) the Coast Guard's acquisition approach for the Deepwater program; (2) Coast Guard efforts to manage the program, hold contractors accountable, and control costs through competition; (3) the status of the Coast Guard's efforts to acquire new or upgraded Deepwater assets; and (4) operational challenges the Coast Guard is facing because of performance and design problems with Deepwater patrol boats.

What GAO Recommends

This testimony contains no recommendations. In 2004, GAO made 11 recommendations on management and oversight, contractor accountability, and cost control through competition. In addition, in April 2006 we reported that progress had been made, but continued monitoring was warranted.

www.gao.gov/cgi-bin/getrpt?GAO-07-575T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Stephen L. Caldwell at (202) 512-9610 or CaldwellS@gao.gov.

COAST GUARD

Status of Efforts to Improve Deepwater Program Management and Address Operational Challenges

What GAO Found

In 2001, we described the Deepwater program as "risky" due to the unique, untried acquisition strategy for a project of this magnitude. The Coast Guard used a system-of-systems approach to replace deteriorating assets with a single, integrated package of assets. The Coast Guard also used a system integrator—which relies on a contractor for requirements development, design, and source selection of major system and subsystem subcontractors. The Deepwater program is also a performance-based acquisition, meaning that it is structured around the results to be achieved rather than the manner in which the work is performed. If performance-based acquisitions are not appropriately planned and structured, there is an increased risk that the government may receive products or services that are over cost estimates, delivered late, and of unacceptable quality.

From the program's outset, GAO has raised concerns about the risks involved with the Coast Guard's Deepwater acquisition strategy. In 2004, GAO reported that program management, contractor accountability, and cost control were all challenges, and made recommendations in these areas. The Coast Guard has taken some actions to address these issues.

Of the 10 classes of upgraded or new Deepwater aircraft and vessels, the delivery record for first-in-class assets (that is, the first asset to be delivered within each class) is mixed. Specifically, 7 of the 10 asset classes are on or ahead of schedule, while 3 asset classes are currently behind schedule due to various problems related to designs, technology, or funding.

The Coast Guard is facing operational challenges because of performance and design problems with Deepwater patrol boats. Specifically, in November 2006, performance problems led the Coast Guard to suspend all normal operations of the 123-foot patrol boats that had been converted from 110-foot patrol boats. In addition, in February 2006, the Coast Guard suspended design work on the Fast Response Cutter, due to design risks that has led to a delivery delay for the vessel.

Deepwater Vessel and Aircraft Classes

National Security Cutter (NSC)	Offshore Patrol Cutter (OPC)	Fast Response Cutter (FRC)	Short-Range Prosecutor (SRP)	Long-Range Interceptor (LRI)
HH-65 Multi-Mission Cutter Helicopter (MCH)	HH-60 Medium Range Recovery Helicopter (MRR)	Maritime Patrol Aircraft (MPA)	HV-911 Vertical Takeoff Unmanned Aerial Vehicle (VUAV)	Long-Range Surveillance Aircraft (LRS)

Source: U.S. Coast Guard.

Mr. Chairman and Members of the Committee:

Thank you for inviting me here today to discuss GAO's recent reviews of Coast Guard's Deepwater program, a \$24 billion effort to upgrade or replace existing aircraft and vessels to ensure Coast Guard's ability to meet its many missions. The Deepwater program is eventually to include 10 major classes of new or upgraded assets—5 major classes each of aircraft and vessels. To carry out this effort, the Coast Guard has relied on an acquisition strategy that gives responsibility to a contractor (systems integrator) for designing, integrating, and delivering a number of aircraft, vessels, and supporting communications equipment. Using a systems integrator in this fashion means that the government is acquiring management capacity it has historically maintained in house through a service contract.

GAO has been involved in reviewing the Deepwater program since 2001, and has informed Congress, the Department of Homeland Security (DHS), and the Coast Guard of risks and challenges associated with the program. Specifically, GAO has raised concerns related to the Coast Guard's acquisition strategy for Deepwater, changes in the asset mix and delivery schedules, as well as Coast Guard's ability to manage the program and oversee the systems integrator's performance.¹ In March 2004, we made recommendations to the Coast Guard to address three areas of concern: improving program management, strengthening contractor accountability, and promoting cost control through greater competition among potential subcontractors.

Challenges associated with specific Deepwater assets have recently received significant attention. For example, the Commandant made a decision to remove the 123-foot patrol boats, a converted legacy asset, from service on November 30, 2006 due to operational and safety concerns. This decision has created operational gaps for those missions the patrol boats perform and the Coast Guard is currently attempting to address this through a number of different strategies.

¹ GAO, *Coast Guard: Progress Being Made on Deepwater Project, but Risks Remain*, [GAO-01-564](#) (Washington, D.C.: May 2, 2001); 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).

This statement offers information on the Coast Guard's efforts to manage the Deepwater program and address operational challenges that have arisen. Specifically, it discusses:

- the Coast Guard's acquisition approach for the Deepwater program;
- Coast Guard efforts to manage the Deepwater program, hold contractors accountable, and control costs through competition;
- the status of the Coast Guard's efforts to acquire new or upgraded Deepwater assets; and
- operational challenges the Coast Guard is facing because of performance and design problems with Deepwater patrol boats.

The information noted in this testimony is based on our review of key documents, including the 2005 Deepwater Acquisition Program Baseline; schedule information provided by the Coast Guard; Coast Guard memoranda regarding the 123-foot patrol boat conversion; and Coast Guard's human capital plan, its award fee and award term documentation, and its competition monitoring plan. We conducted interviews with Coast Guard officials at agency headquarters in Washington, D.C.; officials in Coast Guard's System Integration Program Office in Arlington, VA; and Coast Guard contractor staff. In addition, we interviewed Coast Guard officials during visits to the Pacific and Atlantic Area Commands and their associated Maintenance and Logistics Commands and at the Coast Guard's Aircraft Repair and Supply Center. Our work was conducted from August 2006 to February 2007 in accordance with generally accepted government auditing standards. In addition, GAO has been reviewing the Deepwater program since 2001, and some of the information in this testimony comes from our earlier work. Appendix I contains a list of related GAO products.

Summary

In 2001, we described the Deepwater program as "risky" due to the unique, untried acquisition strategy for a project of this magnitude within the Coast Guard. The Coast Guard used a system-of-systems approach to replace deteriorating assets with a single, integrated package of aircraft, vessels, and unmanned aerial vehicles to be linked through systems that provide command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR), and supporting logistics. In a system-of-systems, the delivery of Deepwater assets are interdependent, thus schedule slippages and uncertainties associated with potential changes in the design and capabilities of any one asset increases the overall risk that the Coast Guard might not meet its expanded homeland security missions within given budget parameters and milestone dates. The Coast Guard also used a systems integrator—which can give the

contractor extensive involvement in requirements development, design, and source selection of major system and subsystem subcontractors. The Deepwater program is also a performance-based acquisition, meaning that it is structured around the results to be achieved rather than the manner in which the work is performed. If performance-based acquisitions are not appropriately planned and structured, there is an increased risk that the government may receive products or services that are over cost estimates, delivered late, and of unacceptable quality.

In 2004 and in subsequent assessments in 2005 and 2006, we reported concerns about the Deepwater program related to three main areas—program management, contractor accountability, and cost control. The Coast Guard’s ability to effectively manage the program has been challenged by staffing shortfalls and poor communication and collaboration among Deepwater program staff, contractors, and field personnel who operate and maintain the assets. Despite documented problems in schedule, performance, cost control, and contract administration, measures for holding the contractor accountable resulted in an award fee of \$4 million (of the maximum \$4.6 million) for the first year. Through the first 4 years of the Deepwater contract, the systems integrator received award fees that ranged from 87 percent to 92 percent of the total possible award fee (scores that ranged from “very good” to “excellent” based on Coast Guard criteria), for a total of over \$16 million. Further, the program’s ability to control Deepwater costs is uncertain given the Coast Guard’s lack of detailed information on the contractor’s competition decisions. While the Coast Guard has taken some actions to improve program outcomes, our assessment of the program and its efforts to address our recommendations continues, and we plan to report on our findings later this year.

Of the 10 classes of upgraded or new Deepwater aircraft and vessels, the delivery record for first-in-class assets (that is, the first of multiple aircraft or vessels to be delivered within each class) is mixed. Specifically, 7 of the 10 asset classes are on or ahead of schedule. Among these, five first-in-class assets have been delivered on or ahead of schedule; and two others remain on schedule but their planned delivery dates are in 2009 or beyond. Three Deepwater asset classes are currently behind schedule due to various problems related to designs, technology, or funding. For example, the Fast Response Cutter (a new vessel), which had been scheduled for first-in-class delivery in 2007, has been delayed by at least 2 years in part because work on its design was suspended until technical problems related to its hull and other issues can be addressed. The Vertical Unmanned Aerial Vehicle (a new aircraft), which had also been scheduled

for delivery in 2007, has been delayed by 6 years due to evolving technological developments, among other things. In addition, the Offshore Patrol Cutter, which had a planned delivery date in 2010, has now been delayed by 5 years.

The Coast Guard is facing operational challenges because of performance and design problems with Deepwater patrol boats. Specifically, the conversion of legacy 110-foot patrol boats to upgraded 123-foot patrol boats was stopped at eight hulls (rather than the entire fleet of 49) due to deck cracking, hull buckling, and shaft alignment problems. These patrol boat conversion problems ultimately led the Coast Guard to suspend all normal operations of the eight converted 123-foot patrol boats on November 30, 2006. The Coast Guard is now exploring options to address the resulting short-term operational gaps. There have also been design problems with the new Fast Response Cutter (FRC), intended to replace all 110-foot and 123-foot patrol boats. In February 2006, the Coast Guard suspended design work on the FRC due to design risks, such as excessive weight and horsepower requirements.² According to the Coast Guard, it has decided to acquire two classes of FRCs in an effort to not delay delivery of the FRCs further. One class is to be based on an adapted design from a patrol boat already on the market and another class is to be redesigned to address the problems in the original FRC design plans. As with the 123-foot patrol boats, the Coast Guard is looking at options to address these long-term operational gaps.

Background

The Coast Guard is the lead federal agency for maritime security within DHS. The Coast Guard is responsible for a variety of missions, including ensuring ports, waterways, and coastline security; conducting search and rescue missions; interdicting illicit drug shipments and illegal aliens; and enforcing fisheries laws. In 1996, in order to continue carrying out its responsibilities and operations, the Coast Guard initiated the Deepwater program to replace or upgrade its aging vessels, aircraft, and other essential equipment.

As originally conceived, Deepwater was designed around producing aircraft and vessels that would function in the Coast Guard's traditional at-sea roles—such as interdicting illicit drug shipments or rescuing mariners

² GAO, *Coast Guard: Status of Deepwater Fast Response Cutter Design Efforts*, [GAO-06-764](#) (Washington, D.C.: June 23, 2006).

from difficulty at sea—and the original 2002 Deepwater program was focused on those traditional missions. After the terrorist attacks on September 11, 2001, the Coast Guard was also assigned homeland security missions related to protection of ports, waterways, and coastal areas. Based on its revised mission responsibilities, the Coast Guard updated its Deepwater Acquisition Program Baseline in November 2005. The new baseline contained changes in the balance between new assets to be acquired and legacy assets to be upgraded and adjusted the delivery schedule and costs for many of these assets. Overall, the Deepwater acquisition schedule was lengthened by 5 years, with the final assets now scheduled for delivery in 2027.

Upon its completion, the Deepwater program is to consist of 5 new classes of vessels, 1 new class of fixed-wing aircraft, 1 new class of unmanned aerial vehicles, 2 classes of upgraded helicopters, and 1 class of upgraded fixed-wing aircraft.³ The 215 new vessels consist of five new asset classes—the National Security Cutter (NSC), Offshore Patrol Cutter (OPC), Fast Response Cutter (FRC), Long-Range Interceptor (LRI), and Short-Range Prosecutor (SRP). The 240 aircraft are composed of two new aircraft classes, the Vertical Unmanned Aerial Vehicle (VUAV) and the Maritime Patrol Aircraft (MPA); and three upgraded asset classes—the Long-Range Surveillance Aircraft (LRS), Medium-Range Recovery Helicopter (MRR), and the Multi-Mission Cutter Helicopter (MCH).

Table 1 provides an overview, by asset class, of the Deepwater vessels to be acquired and table 2 provides an overview of the Deepwater aircraft to be acquired or upgraded. As noted in Table 1, the 140-foot FRC was designated as a replacement vessel for the 110-foot and 123-foot patrol boats.

³ In addition to these asset classes, Coast Guard plans to procure surveillance data from another unmanned aerial vehicle, the RQ-4A. Because this is not to be acquired as a capital investment, we do not include it among the assets to be acquired or upgraded.

Table 1: Deepwater Vessel Classes to be Acquired

	National Security Cutter (NSC)	Offshore Patrol Cutter (OPC)	Fast Response Cutter (FRC)	Short-Range Prosecutor (SRP)	Long-Range Interceptor (LRI)
					
Current number of assets planned	8	25	58	91	33
Asset being replaced or upgraded	378-foot high-endurance cutters	210-foot and 270-foot medium-endurance cutters	110-foot and 123-foot patrol boats	None (new asset)	None (new asset)
Missions	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources • National defense 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources • National defense 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources • National defense 	<ul style="list-style-type: none"> • Maritime safety • Maritime security 	<ul style="list-style-type: none"> • Maritime safety • Maritime security

Source: GAO analysis of Coast Guard documentation.

Table 2: Deepwater Aircraft Classes to be Upgraded or Acquired

	HH-65 Multi-Mission Cutter Helicopter (MCH)	HH-60 Medium Range Recovery Helicopter (MRR)	Maritime Patrol Aircraft (MPA)	HV-911 Vertical Takeoff Unmanned Aerial Vehicle (VUAV)	Long-Range Surveillance Aircraft (LRS)
					
Current number of assets planned	102	42	36	45	22
Asset being replaced or upgraded	Upgraded asset (HH-65)	Upgraded asset (HH-60)	HU-25 Falcon	None (new asset)	Upgraded asset (HC-130)
Missions	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources • National defense 	<ul style="list-style-type: none"> • Maritime safety • Maritime security • Protection of natural resources

Source: GAO analysis of Coast Guard documentation.

Since 2001, we have reviewed the Deepwater program and have informed Congress, DHS, and Coast Guard of the problems, risks, and uncertainties inherent with such a large acquisition that relies on a systems integrator to identify the assets needed and then using tiers of subcontractors to design and build the assets. In March 2004, we made recommendations to the Coast Guard to address three broad areas of concern: improving program management, strengthening contractor accountability, and promoting cost control through greater competition among potential subcontractors (see table 3).⁴

⁴ GAO-04-380

Table 3: Status of GAO Recommendations to the U.S. Coast Guard Regarding Management of the Deepwater Program, as of April 28, 2006

Areas of concern	Recommendations to the U.S. Coast Guard	Recommendation status
Key components of management and oversight	Put in place a human capital plan to ensure adequate staffing of the Deepwater program	Partially implemented ^a (human capital plan was revised)
	Improve integrated product teams (IPTs) responsible for managing the program by providing better training, approving charters for sub-IPTs, and improving systems for sharing information between teams	Partially implemented
	Provide field operators and maintenance personnel with timely information and training on how the transition to Deepwater assets will occur and how maintenance responsibilities are to be divided between the systems integrator and Coast Guard personnel	Partially implemented
Procedures for ensuring contractor accountability	Develop measurable award fee criteria consistent with guidance from the Office of Federal Procurement Policy	Implemented
	Provide for better input from U.S. Coast Guard performance monitors	Implemented
	Hold the systems integrator accountable in future award fee determinations for improving effectiveness of the IPTs	Implemented
	Establish a baseline for determining whether the acquisition approach is costing the government more than the traditional asset replacement approach	Will not be implemented
	Establish a time frame for when the models and metrics will be in place with the appropriate degree of fidelity to be able to measure contractor's progress toward improving operational effectiveness	Partially implemented
	Establish criteria to determine when to adjust the project baseline and document the reasons for change	Partially implemented
Control of future costs through competition	For subcontracts over \$5 million awarded by the systems integrator to the two major subcontractors, require notification to the Coast Guard about decision to perform the work in-house rather than contracting it out	Implemented
	Develop a comprehensive plan for holding the systems integrator accountable for ensuring adequate competition among suppliers	Partially implemented

Source: GAO-04-380 and GAO-06-546.

Note: ^aWhile the Coast Guard has revised its human capital plan, it has not yet addressed the rest of the recommendation, which is to ensure adequate staffing for the Deepwater program.

Coast Guard's Acquisition Approach to the Deepwater Program

In 2001, we described the Deepwater program as “risky” due to the unique, untried acquisition strategy for a project of this magnitude within the Coast Guard. The approach included the development of a system-of-systems, a single systems integrator, and a performance-based contract.

System of Systems

Rather than using the traditional approach of replacing classes of ships or aircraft through a series of individual acquisitions, the Coast Guard chose to use a system-of-systems acquisition strategy that would replace its deteriorating assets with a single, integrated package of aircraft, vessels, and unmanned aerial vehicles, to be linked through systems that provide C4ISR, and supporting logistics.⁵ Through this approach, the Coast Guard hoped to avoid “stovepiping” the acquisition of vessels and aircraft, which might lead to a situation where they could not operate optimally together.

Despite the Coast Guard's intention to avoid stovepiping in the acquisition process, we found that the Deepwater program has not been as integrated as hoped. Our past work on Deepwater noted that decisions on aircraft were made by one subcontractor, while decisions regarding vessels were made by another subcontractor. These separate lines of decision-making can lessen the likelihood that a system-of-systems outcome will be achieved if decisions affecting the entire program are made without the full consultation of all parties involved. Our more recent work on the Fast Response Cutter (FRC)—which is discussed in more detail later—indicated that changes in the design and delivery date for the FRC could affect the operations of the overall system-of-systems approach. Because the delivery of Deepwater assets are interdependent within the system-of-systems acquisition approach, schedule slippages and uncertainties associated with potential changes in the design and capabilities of the new assets have increased the risks of the Coast Guard failing to meet its expanded homeland security missions within given budget parameters and milestone dates.

Systems Integrator

In June 2002, the Coast Guard awarded the Deepwater contract to Integrated Coast Guard Systems (ICGS). ICGS—a business entity jointly

⁵ C4ISR refers to command, control, communications, computer, intelligence, surveillance, and reconnaissance.

owned by Northrop Grumman and Lockheed Martin—is responsible for designing, constructing, deploying, supporting, and integrating the Deepwater assets to meet Coast Guard requirements.

Government agencies have turned to the systems integrator approach when they believe they do not have the in-house capability to design, develop, and manage complex acquisitions.⁶ This type of business arrangement can give the contractor extensive involvement in requirements development, design, and source selection of major system and subsystem subcontractors. Giving contractors more control and influence over the government’s acquisitions in a systems integrator role creates a potential risk that program decisions and products could be influenced by the financial interest of the contractor—which is accountable to its shareholders—which may not match the primary interest of the government, maximizing its return on taxpayer dollars. The systems integrator arrangement creates an inherent risk, as the contractor is given more discretion to make certain program decisions. Along with this greater discretion comes the need for more government oversight and an even greater need to develop well-defined outcomes at the outset.

Performance-based Acquisition

The Deepwater program has been designated as a performance-based acquisition. When buying services, federal agencies are currently required to employ—to the maximum extent feasible—this concept, wherein acquisitions are structured around the results to be achieved as opposed to the manner in which the work is to be performed. That is, the government specifies the outcome it requires while leaving the contractor to propose decisions about how it will achieve that outcome. Performance-based contracts for services are required to include a performance work statement; measurable performance standards (i.e., in terms of quality, timeliness, quantity, etc.) as well as the method of assessing contractor performance against these standards; and performance incentives, where appropriate. If performance-based acquisitions are not appropriately planned and structured, there is an increased risk that the government may receive products or services that are over cost estimates, delivered late, and of unacceptable quality.

⁶ This management approach of using a systems integrator has been used on other government programs that require system-of-systems integration, such as the Army’s Future Combat System, a networked family of weapons and other systems.

Deepwater Indicative of Broader, Systematic Acquisition Challenges

Some of the problems the Coast Guard is experiencing with the Deepwater program are similar to problems we have reported on in other complex, developmental systems.⁷ These problems stem from:

- Program requirements that are set at unrealistic levels, then changed frequently as recognition sets in that they cannot be achieved. As a result, too much time passes; threats may change; and/or members of the user and acquisition communities may simply change their minds. The resulting program instability causes cost escalation, schedule delays, fewer quantities, and reduced contractor accountability.
- Program decisions to move into design and production without adequate standards or knowledge.
- Contracts, especially service contracts, that often do not have measures in place at the outset in order to control costs and facilitate accountability.
- Contracts that typically do not accurately reflect the complexity of projects or appropriately allocate risk between the contractors and the taxpayers.
- Agency acquisition workforces that are challenged because of size, skills, insufficient knowledge, and succession planning.
- Incentive and award fees that are often paid based on contractor efforts versus positive results, such as cost, quality, and schedule.
- Inadequate government oversight that results in little to no accountability for recurring and systemic problems.

Preliminary Observations on Deepwater Program Management, Contractor Accountability, and Cost Control

Since the inception of the Deepwater program, we have expressed concerns about the risks involved with the Coast Guard's system-of-systems acquisition approach and the Coast Guard's ability to manage and oversee the program. Our concerns have centered on three main areas: program management, contractor accountability, and cost control through competition. We have made a number of recommendations to improve the program—most of which the Coast Guard has agreed with and is working to address. However, while actions are under way, a project of this magnitude will likely continue to experience other problems as more becomes known.

Program Management

In 2004, we reported that the Coast Guard had not effectively implemented key components needed to manage and oversee the systems integrator.

⁷ GAO, *High Risk Series: An Update*, [GAO-07-310](#) (Washington, D.C.: January 2007).

Specifically, we reported at that time and subsequently on issues related to integrated product teams (IPT), the Coast Guard's human capital strategy, and communication with field personnel (individuals responsible for operating and maintaining the assets). Our preliminary observations on the Coast Guard's progress in improving these program management areas, based on our ongoing work, follow.

Integrated Product Teams

In 2004, we found that IPTs, the Coast Guard's primary tool for managing the Deepwater program and overseeing the contractor, had not been effective due to changing membership, understaffing, insufficient training, lack of authority for decision making, and inadequate communication. We recommended the Coast Guard take actions to address IPT effectiveness. We subsequently reported that IPT decision-making was to a large extent stovepiped, and some teams lacked adequate authority to make decisions within their realm of responsibility.⁸ Coast Guard officials stated that they believed collaboration among the subcontractors was problematic and that the systems integrator wielded little influence to compel decisions among them. For example, proposed design changes to assets under construction were submitted as two separate proposals from both subcontractors rather than one coherent plan. More recently, Coast Guard performance monitors reported this approach complicated the government review of design changes because the two proposals often carried overlapping work items, thereby forcing the Coast Guard to act as the systems integrator in those situations. Although some efforts have been made to improve the effectiveness of the IPTs—such as providing them with more timely charters and entry-level training—our preliminary observations are that more improvements are needed.

Despite changes to the metrics, the Coast Guard's ability to assess IPT performance continues to be problematic. Former assessments of IPT effectiveness simply focused on measures such as frequency of meetings, attendance, and training. As a result, IPTs received positive assessments while the assets under their realm of responsibility—such as the National Security Cutter—were experiencing problems. While the Coast Guard's new IPT measurements include outcome-based metrics, such as cost and schedule performance of assets, Deepwater's overall program management quarterly reports, which are prepared by Coast Guard in

⁸ GAO, *Coast Guard: Progress Being Made on Addressing Legacy Asset Condition Issues and Program Management, but Acquisition Challenges Remain*, [GAO-05-757](#) (Washington, D.C.: July 22, 2005).

collaboration with ICGS, show that the connection between IPT performance and program results continues to be misaligned.⁹ For example, the first quarterly report to incorporate the new measurements, covering the period October to December 2006, indicates that the IPTs' performance for all domains is "on-schedule or non-problematic" even while some assets' cost or schedule performance is rated "behind schedule or problematic."¹⁰ Further, even though the Deepwater program is addressing fundamental problems surrounding the 123-foot patrol boat and FRC, IPTs no longer exist for these assets. In some cases, Coast Guard officials stated they have established work groups outside of the existing IPT structure to address identified issues and problems related to assets, such as the NSC.

Human Capital

We also reported in 2004 that the Coast Guard had not adequately staffed its program management function for Deepwater. Although its Deepwater human capital plan set a goal of a 95 percent or higher "fill rate" annually for both military and civilian personnel, funded positions were below this goal. We recommended that the Coast Guard follow the procedures in its Deepwater human capital plan to ensure that adequate staffing was in place and that turnover of Coast Guard military personnel was proactively addressed. The Coast Guard subsequently revised its Deepwater human capital plan in February 2005 to emphasize workforce planning, including determining needed knowledge, skills, and abilities and developing ways to leverage institutional knowledge as staff rotate out of the program. We reported in 2005 that the Coast Guard also took some short-term steps to improve Deepwater program staffing, such as hiring contractors to assist with program support functions, shifting some positions from military to civilian to mitigate turnover risk, and identifying hard-to-fill positions and developing recruitment plans specifically for them.

However, more recently we have learned that while the Coast Guard has revised a human capital plan, key human capital management objectives outlined in the revised plan have not been fully implemented. Thus, key human capital management objectives outlined in the revised plan have not been accomplished and the staffing levels needed to accomplish the

⁹ The program management reports were produced on a monthly basis in the past; now they are produced on a quarterly basis.

¹⁰ IPTs are focused on the development and fielding of a particular product (e.g., the NSC) and are organized by domain. Examples of domains are air, surface, C4ISR, and legacy assets.

Communication with
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known workload have not been achieved. In one example, a manager cited the need for five additional staff per asset under his domain to satisfy the current workload in a timely manner: contracting officer's technical representative, scheduler, cost estimator, analyst, and configuration manager. Further, a February 2007 independent analysis found that the Coast Guard does not possess a sufficient number of acquisition personnel or the right level of experience needed to manage the Deepwater program.¹¹ The Coast Guard has identified an acquisition structure re-organization that includes human capital as one component of the reform.

In 2004, we found that the Coast Guard had not adequately communicated to operations and maintenance personnel in field locations about decisions on how the new and old assets were to be integrated during the transition and whether Coast Guard or systems integrator personnel—or both—would be responsible for maintenance. We recommended that the Coast Guard provide timely information and training on the transition to Deepwater assets. In 2006, we reported that the Coast Guard had taken some steps to improve communications between Deepwater program and field personnel, including having field personnel as members on some IPTs. However, we continued to express concerns that field personnel were not receiving important information regarding training, maintenance, and integration of new Deepwater assets.

During our ongoing work, the field personnel involved in operating and maintaining the assets and Deepwater program staff we interviewed expressed continued concern that maintenance and logistics plans had not been finalized. Another official commented that there continues to be a lack of clarity defining roles and responsibilities between the Coast Guard and systems integrator for maintenance and logistics. Coast Guard officials stated in fall 2006 that the systems integrator was contractually responsible for developing key documents related to plans for the maintenance and logistics for the NSC and Maritime Patrol Aircraft. However, Deepwater program officials stated that because the Coast Guard was not satisfied with the level of detail provided in early drafts of these plans, it was simultaneously developing “interim” plans that it could rely on while the systems integrator continued to develop its own versions.

¹¹ Defense Acquisition University, *Quick Look Study: United States Coast Guard Deepwater Program*, (Fort Belvoir, VA.): Feb. 5, 2007

Concerns Remain with Holding Systems Integrator Accountable

Our 2004 review revealed that the Coast Guard had not developed quantifiable metrics to hold the systems integrator accountable for its ongoing performance. For example, the process by which the Coast Guard assessed performance to make the award fee determination after the first year of the contract lacked rigor. At that time, we also found that the Coast Guard had not yet begun to measure contractor performance against Deepwater contract requirements—the information it would need by June 2006 to decide whether to extend the systems integrator’s contract award term by up to another 5 years. Additionally, we noted that the Coast Guard needed to establish a solid baseline against which to measure progress in lowering total ownership cost—one of the three overarching goals of the Deepwater program. Furthermore, the Coast Guard had not developed criteria for potential adjustments to the baseline.

Award Fee Criteria

In 2004 we found the first annual award fee determination was based largely on unsupported calculations. Despite documented problems in schedule, performance, cost control, and contract administration throughout the first year, the program executive officer awarded the contractor an overall rating of 87 percent, which fell in the “very good” range as reported by the Coast Guard award fee determining official. This rating resulted in an award fee of \$4 million of the maximum \$4.6 million. The Coast Guard continued to report design, cost, schedule, and delivery problems, and evaluation of the systems integrator’s performance continued to result in award fees that ranged from 87 percent to 92 percent of the total possible award fee (with 92 percent falling into the “excellent” range), or \$3.5 to \$4.8 million annually, for a total of over \$16 million the first 4 years on the contract.

The Coast Guard continues to refine the award fee criteria under which it assesses the systems integrator’s performance. The current award fee criteria demonstrate the Coast Guard’s effort to use both objective and subjective measures and to move toward clarity and specificity with the criteria being used. For example, the criteria include 24 specific milestone activities and dates to which the systems integrator will be held accountable for schedule management. However, we recently observed two changes to the criteria that could affect the Coast Guard’s ability to hold the contractor accountable. First, the current award fee criteria no longer contain measures that specifically address IPTs, despite a recommendation we made in 2004 that the Coast Guard hold the systems integrator accountable for IPT effectiveness. The Coast Guard had agreed with this recommendation and, as we reported in 2005, it had incorporated award fee metrics tied to the systems integrator’s management of Deepwater, including administration, management commitment,

collaboration, training, and empowerment of the IPTs. Second, a new criterion to assess both schedule and cost management states that the Coast Guard will not take into account milestone or cost impacts determined by the government to be factors beyond the systems integrator's control. However, a Coast Guard official stated that there are no formal written guidelines that define what factors are to be considered as being beyond the systems integrator's control, what process the Coast Guard is going to use to make this determination, or who is ultimately responsible for making those determinations.

Award Term Evaluation

The Deepwater program management plan included three overarching goals of the Deepwater program: increased operational effectiveness, lower total ownership cost, and customer satisfaction to be used for determining whether to extend the contract period of performance, known as the award term decision. We reported in 2004 that the Coast Guard had not begun to measure the systems integrator's performance in these three areas, even though the information was essential to determining whether to extend the contract after the first 5 years.¹² We also reported that the models the Coast Guard was using to measure operational performance lacked the fidelity to capture whether improvements may be due to Coast Guard or contractor actions, and program officials noted the difficulty of holding the contractor accountable for operational effectiveness before Deepwater assets are delivered. We made a recommendation to Coast Guard to address these issues.

According to a Coast Guard official, the Coast Guard evaluated the contractor subjectively for the first award term period in May 2006, using operational effectiveness, total ownership costs, and customer satisfaction as the criteria. The result was a new award term period of 43 of a possible 60 months. To measure the system's operational effectiveness, the Coast Guard has developed models to simulate the effect of the Deepwater assets' capabilities on its ability to meet its missions and to measure the "presence" of those assets. However, in its assessment of the contractor, the Coast Guard assumed full operational capability of assets and communications and did not account for actual asset operating data. Furthermore, the models still lacked the fidelity to capture whether operational improvements are attributable to Coast Guard or contractor actions. As a result the contractor received credit for factors that may

¹² An award term contract is a contract in which the contractor is rewarded for excellent performance with an extension of the contract period instead of an additional fee.

have been beyond its control—although no formal process existed for approving such factors. Total ownership cost was difficult to measure, thus the contractor was given a neutral score, according to Coast Guard officials.¹³ Finally, the contractor was rated “marginal” in customer satisfaction.

The Coast Guard has modified the award term evaluation criteria to be used to determine whether to grant a further contract extension after the 43-month period ends in January 2011. The new criteria incorporate more objective measures.

- While the three overall Deepwater program objectives (operational effectiveness, total ownership costs, and customer satisfaction) carried a weight of 100 percent under the first award term decision, they will represent only about a third of the total weight for the second award term decision. The criteria include items such as new operational effectiveness measures that will include an evaluation of asset-level key performance parameters, such as endurance, operating range, and detection range.
- The new award term criteria have de-emphasized measurement of total ownership cost, concentrating instead on cost control. Program officials noted the difficulty of estimating ownership costs far into the future, while cost control can be measured objectively using actual costs and earned value data. In 2004, we recommended that the Coast Guard establish a total ownership cost baseline that could be used to periodically measure whether the Deepwater system-of-systems acquisition approach is providing the government with increased efficiencies compared to what it would have cost without this approach. Our recommendation was consistent with the cost baseline criteria set forth in the Deepwater program management plan. The Coast Guard agreed with the recommendation at the time, but subsequently told us it does not plan to implement it.

Establishing Criteria and Documenting Changes to the Baseline

Establishing a solid baseline against which to measure progress in lowering total ownership cost is critical to holding the contractor accountable. The Coast Guard’s original plan, set forth in the Deepwater program management plan, was to establish as its baseline the dollar value of replacing assets under a traditional, asset-by-asset approach as the “upper limit for total ownership cost.” In practice, the Coast Guard

¹³ The award term determination rated total ownership cost as “good.”

decided to use the systems integrator's estimated cost of \$70.97 billion plus 10 percent (in fiscal year 2002 dollars) for the system-of-systems approach as the baseline. In 2004, we recommended that the Coast Guard establish criteria to determine when the total ownership cost baseline should be adjusted and ensure that the reasons for any changes are documented.

Since then, the Coast Guard established a process that would require DHS approval for adjustments to the total ownership cost baseline. The Deepwater Program Executive Officer maintains authority to approve baseline revisions at the asset or domain level. However, depending on the severity of the change, these changes are also subject to review and approval by DHS. In November 2005, the Coast Guard increased the total ownership cost baseline against which the contractor will be evaluated to \$304 billion.¹⁴ Deepwater officials stated that the adjustment was the result of incorporating the new homeland security mission requirements and revising dollar estimates to a current year basis. Although the Coast Guard is required to provide information to DHS on causal factors and propose corrective action for a baseline breach of 8 percent or more, the 8 percent threshold has not been breached because the threshold is measured against total program costs and not on an asset basis.¹⁵ For example, the decision to stop the conversion of the 49 110-foot patrol boats after 8 hulls did not exceed the threshold; nor did the damages and schedule delay to the NSC attributed to Hurricane Katrina. During our ongoing work, Coast Guard officials acknowledged that only a catastrophic event would ever trigger a threshold breach. According to a Coast Guard official, DHS approval is pending on shifting the baseline against which the systems integrator is measured to an asset basis.

Limited Knowledge of Cost Control Achieved Through Competition

Our 2004 report also had recommendations related to cost control through the use of competition. We reported that, although competition among subcontractors was a key mechanism for controlling costs, the Coast Guard had neither measured the extent of competition among the suppliers of Deepwater assets nor held the systems integrator accountable

¹⁴ For a variety of reasons, including the Coast Guard's expanded homeland security mission, the baseline was increased from \$70.97 billion plus 10 percent (fiscal year 2002 dollars) to \$304 billion (fiscal year 2006 dollars).

¹⁵ According to DHS officials, a baseline breach occurs when a cost or schedule threshold is exceeded or when a performance threshold cannot be met.

for taking steps to achieve competition.¹⁶ As the two first-tier subcontractors to the systems integrator, Lockheed Martin and Northrop Grumman have sole responsibility for determining whether to provide the Deepwater assets themselves or hold competitions—decisions commonly referred to as “make or buy.” We noted that the Coast Guard’s hands-off approach to make-or-buy decisions and its failure to assess the extent of competition raised questions about whether the government would be able to control Deepwater program costs.

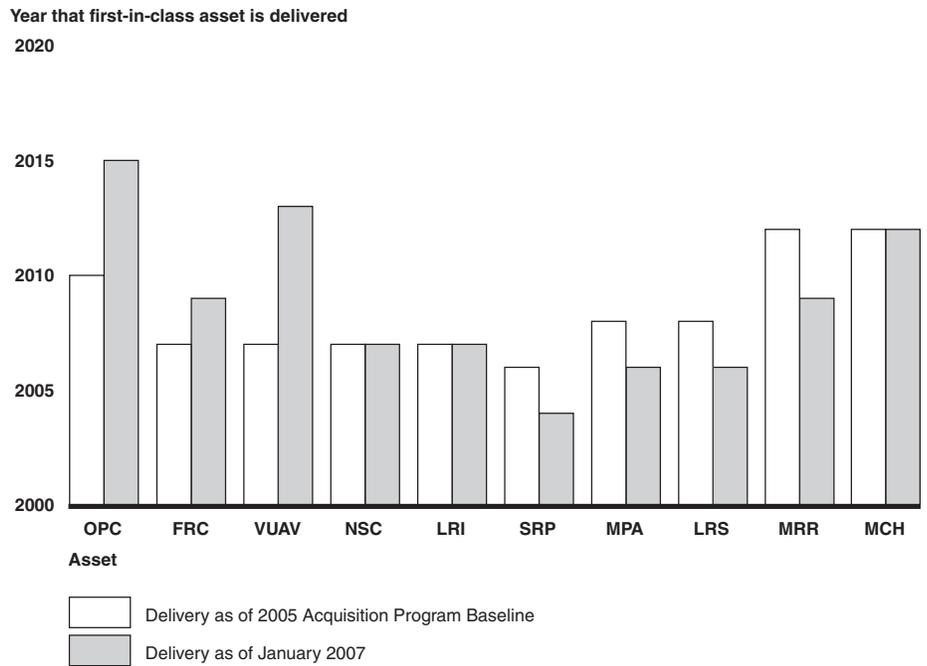
The Coast Guard has taken steps to establish a reporting requirement for the systems integrator to provide information on competition on a semi-annual basis. The systems integrator is to provide detailed plans, policies, and procedures necessary to ensure proper monitoring, reporting, and control of its subcontractors. Further, reports are to include total procurement activity, the value of competitive procurements, and the subcontractors’ name and addresses. The systems integrator provided the first competition report in October 2006. However, because the report did not include the level of detail required by Coast Guard guidelines, a Coast Guard official deemed that the extent of competition could not be validated by the information provided and a request was made to the systems integrator for more information. We will continue to assess the Coast Guard’s efforts to hold the systems integrator accountable for ensuring an adequate degree of competition.

Deepwater Asset Delivery Schedule Shows Mixed Results

Our review of available data show that as of January 2007, of the 10 classes of Deepwater assets to be acquired or upgraded, 4 are ahead of schedule; 3 remain on schedule (but for 1 of these, design problems have arisen); and 3 are behind scheduled delivery and face design, funding, or technology challenges. Using the 2005 Deepwater Acquisition Program Baseline as the baseline, figure 1 indicates, for each asset class, whether delivery of the first-in-class (that is, the first of several to be produced in its class) is ahead of schedule, on schedule, or behind schedule, as of January 2007.

¹⁶ See [GAO-04-380](#).

Figure 1: Comparison of the Estimated Delivery Dates for the First-in-Class Deepwater Assets from the 2005 Deepwater Acquisition Baseline and as of January 2007



Source: GAO analysis of documentation provided by U.S. Coast Guard.

Among the Deepwater assets, 3 of the 5 aircraft classes are upgrades to existing legacy systems, and these are all on or ahead of schedule; 1 new aircraft class is ahead of schedule; and the remaining new aircraft class is 6 years behind schedule. With respect to Deepwater vessels, all 5 asset classes are new, and of these, 2 are behind schedule, and a third, while on schedule, faces structural modifications. The remaining 2 new maritime assets are small vessels that are on or ahead of schedule at this time.

Assets That Are on or Ahead of Schedule as of January 2007

Long-Range Interceptor

The status of each asset class, and our preliminary observations on the factors affecting their status, is discussed below.

The LRI is a 36-foot small boat that is to be carried and deployed on each NSC and OPC. Coast Guard has one LRI on contract for delivery in August 2007, to match delivery of the first NSC.

Short-Range Prosecutor

According to the Coast Guard, the SRP is on schedule at this time and 8 have been delivered to date. Coast Guard is currently planning to pursue construction and delivery of the remaining SRPs outside of the systems integrator contract. By doing so, the Coast Guard expects to achieve a cost savings.

Maritime Patrol Aircraft

The MPA is a commercial aircraft produced in Spain that is being acquired to replace the legacy HU-25 aircraft and will permit the Coast Guard to carryout missions such as search and rescue, marine environmental protection, and maritime security. The first MPA was delivered to the Coast Guard in December 2006 and the second and third are due for delivery by April 2007. Pilots and aircrew participated in training classes in Spain, and Coast Guard is to take responsibility for the development and implementation of MPA's maintenance and logistics.

Long-Range Surveillance Aircraft

The LRS is an upgraded legacy fixed-wing aircraft that includes 6 C-130Js and 16 C-130Hs. The first aircraft entered the modification process in January 2007, and five additional aircraft are to be modified by July 2008. In fiscal year 2008, funding has been requested to upgrade the C-130H radar and avionics, and for the C-130J fleet introduction.

Medium-Range Recovery Helicopter

The MRR is an upgraded legacy HH-60 helicopter. It began receiving a series of upgrades beginning in fiscal year 2006, which will continue into fiscal year 2012, including the service life extension program and radar upgrades.

Multi-Mission Cutter Helicopter

The MCH is an upgraded legacy HH-65 helicopter. According to Coast Guard officials, the MCH assets will not have a single delivery date, as the process involves three phases of upgrades. Phase I is the purchase and delivery of new engines and engine control systems, Phase II is a service-life extension program, and Phase III includes communications upgrades. A Coast Guard official stated that 84 of the 95 HH-65s should be re-engined by June 2007, and all 95 should be finished by October 2007. The fiscal year 2008 congressional budget justification states that Phase II began in fiscal year 2007 and will end in fiscal year 2014, and that Phase III is to begin in fiscal year 2008 and is to end in fiscal year 2014.

National Security Cutter

According to Coast Guard documentation, the first NSC is on schedule for delivery in August 2007 despite required modifications regarding its structural integrity. In particular, the Coast Guard Commandant recently stated that internal reviews by Coast Guard engineers, as well as by independent analysts, have concluded that the NSC, as designed, will need structural reinforcement to meet its expected 30-year service life. In

addition, the DHS Office of Inspector General recently reported that the NSC design will not achieve a 30-year service life based on an operating profile of 230 days underway per year in general Atlantic and North Pacific sea conditions and added that Coast Guard technical experts believe the NSC's design deficiencies will lead to increased maintenance costs and reduced service life.¹⁷

To address the structural modifications of the NSC, Coast Guard is taking a two-pronged approach. First, Coast Guard is working with contractors to enhance the structural integrity of the hulls of the remaining six NSCs that have not yet been constructed. Second, after determining that the NSC's deficiencies are not related to the safe operation of the vessel in the near term, Coast Guard has decided to address the structural modifications of the hulls of the first two cutters as part of planned depot-level maintenance after they are delivered. The Commandant stated that he decided to delay the repairs to these hulls to prevent further delays in construction and delivery.

Deepwater Assets Behind Schedule as of January 2007

Offshore Patrol Cutter

Coast Guard officials have stated that further work on the development of the OPC is on hold and the Coast Guard did not request funding for the OPC in fiscal years 2007 or 2008. Delivery of the first OPC has been delayed by 5 years—from 2010 to 2015.

Fast Response Cutter

Concerns about the viability of the design of the FRC have delayed the delivery of the first FRC by at least 2 years. Coast Guard suspended design work on the FRC in late February 2006 because of design risks. Because the Coast Guard has suspended design work, Coast Guard officials now estimate that the first FRC delivery will slip to fiscal year 2010, at the earliest

Vertical Unmanned Aerial Vehicle

According to the Coast Guard, evolving technological developments and the corresponding amount of funding provided in fiscal year 2006 have delayed the delivery of the VUAV by 6 years—from 2007 to 2013. As a result, the Coast Guard has adjusted the VUAV development plan. The

¹⁷ DHS OIG-07-23.

fiscal year 2008 DHS congressional budget justification indicates that the Coast Guard does not plan to request funding for the VUAV through fiscal year 2012. Coast Guard originally intended on matching the NSC and VUAV delivery dates so that the VUAV could be launched from the NSC to provide surveillance capabilities beyond the cutter's visual range or sensors. However, with the delay in the VUAV's development schedule, it no longer aligns with the NSC's initial deployment schedule. Specifically, Coast Guard officials stated that the VUAV will not be integrated with the NSC before fiscal year 2013, 6 years later than planned. Coast Guard officials stated that they are discussing how to address the operational impacts of having the NSC operate without the VUAV. In addition, Coast Guard officials explained that since the time of the original contract award, the Department of Defense has progressed in developing a different unmanned aerial vehicle—the Fire Scout—that Coast Guard officials say is more closely aligned with Coast Guard needs. Coast Guard has issued a contract to an independent third party to compare the capabilities of its planned VUAV to the Fire Scout.

Performance and Design Problems Creating Operational Challenges

In addition to the overall management problems, there have been problems with the performance and design of Deepwater patrol boats and its replacement vessel, the FRC, that pose significant operational challenges for the Coast Guard.

Performance Problems with the Converted 123-foot Patrol Boats

Between January 2001 and November 2006, numerous events led up to the failure of the Coast Guard's bridging strategy to convert the legacy 110-foot patrol boats into 123-foot patrol boats. In January 2001, an independent study found that the 110-foot patrol boats based in south Florida and Puerto Rico were experiencing severe hull corrosion and that their structural integrity was deteriorating rapidly.¹⁸ To address these issues, the Coast Guard's original (2002) Deepwater plan included a strategy to convert all 49 of the 110-foot patrol boats into 123-foot patrol boats and to strengthen the hulls. Also, the plan was to provide additional capabilities, such as stern launch and recovery capabilities and enhanced C4ISR. While Coast Guard originally planned to convert all 49 of its 110-foot patrol boats to 123-foot patrol boats, it halted the patrol boat conversion program after 8 boats because of continued deck cracking, hull

¹⁸ CSC Advanced Marine, *Evaluation of the 110' WPB Class Cutter Fleet* (January 2001).

buckling, and the inability of these converted patrol boats to meet post-September 11, 2001 mission requirements. The Commandant then decided to remove these 8 converted boats from service on November 30, 2006 because of operational and safety concerns.

The Coast Guard is taking actions to mitigate the operational impacts resulting from the removal of the 123-foot patrol boats from service. Specifically, in recent testimony, the Commandant of the Coast Guard stated that Coast Guard has taken the following actions:

- multi-crewing certain 110-foot patrol boats with crews from the 123-foot patrol boats that have been removed from service so that patrol hours for these vessels can be increased;
- deploying other Coast Guard vessels to assist in missions formerly performed by the 123-foot patrol boats; and
- securing permission from the U.S. Navy to continue using 179-foot cutters on loan from the Navy for an additional 5 years (these were originally to be returned to the Navy in 2008) to supplement the Coast Guard's patrol craft.

Design Problems with the Fast Response Cutter

The FRC—which was intended as a long-term replacement for the legacy 110-foot patrol boats—has experienced design problems that have operational implications. As we recently reported, the Coast Guard suspended design work on the FRC due to design risks such as excessive weight and horsepower requirements.¹⁹ Specifically, beginning in January 2005, Coast Guard engineers raised concerns about the viability of the FRC design (which involved building the FRC's hull, decks, and bulkheads out of composite materials rather than steel). Then, in February 2006, the Coast Guard suspended FRC design work after an independent design review by third-party consultants demonstrated, among other things, that the FRC would be far heavier and less efficient than a typical patrol boat of similar length, in part, because it would need four engines to meet Coast Guard speed requirements

To address the design problems and schedule delays that have occurred with the FRC, the Coast Guard is proceeding with a “dual-path approach” for acquiring new patrol boats. The first component of the dual-path approach is to have the Deepwater systems integrator purchase a

¹⁹ [GAO-06-764](#).

commercial off-the-shelf patrol boat design that can be adapted for Coast Guard use. The purpose of designing the first class of FRCs based on an adaptation of a patrol boat already on the market is to expedite delivery. According to Coast Guard officials, unlike the original plans, this FRC class is not expected to meet all performance requirements originally specified, but is intended as a way to field an FRC more quickly than would otherwise occur and that can, therefore, serve as an interim replacement for the deteriorating fleet of 110-foot patrol boats.

The second component of the dual-path approach would be to completely redesign an FRC to address the problems in the original FRC design plans. However, due to continuing questions about the feasibility of its planned composite hull, the Coast Guard has delayed a decision about its development or acquisition until it receives results from a business case analysis comparing the use of composite versus steel hulls., as well as a study by DHS's Science and Technology Directorate on composite hull technology. Until recently, the Coast Guard anticipated delivery of the redesigned FRC in 2010. However, the decision to not request funding for this redesigned FRC in fiscal year 2008, and to await the results of both studies before moving forward, will likely further delay delivery of the redesigned FRC. In regard to the suspension of FRC design work, as of our June 2006 report, Coast Guard officials had not yet determined how changes in the design and delivery date for the FRC would affect the operations of the overall system-of-systems approach.

Mr. Chairman, this concludes my testimony. I would be happy to respond to any questions Members of the Committee may have.

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