

GAO

Report to the Subcommittee on
Transportation, Committee on
Appropriations, U.S. Senate

October 1998

COAST GUARD'S
ACQUISITION
MANAGEMENT

Deepwater Project's
Justification and
Affordability Need to Be
Addressed More
Thoroughly



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**Resources, Community, and
Economic Development Division**

B-280862

October 26, 1998

The Honorable Richard C. Shelby
Chairman
The Honorable Frank R. Lautenberg
Ranking Minority Member
Subcommittee on Transportation
Committee on Appropriations
United States Senate

In response to your request, this report discusses the extent to which the Coast Guard has (1) accurately depicted the need to replace or modernize its deepwater ships and aircraft and (2) aligned the estimated cost of its Deepwater Project with its overall budget for capital projects. This report contains recommendations to the Secretary of Transportation to assist the Coast Guard as it proceeds with the project.

As requested, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this letter. We will then send copies to the Secretary of Transportation; the Commandant of the Coast Guard; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request.

If you or your staff have any questions, please call me at (202) 512-2834. Major contributors to this report are listed in appendix IV.

A handwritten signature in cursive script that reads "John H. Anderson, Jr.".

John H. Anderson, Jr.
Director, Transportation Issues

Executive Summary

Purpose

The U.S. Coast Guard is currently planning the potentially largest acquisition project in its history. Called the Deepwater Capability Replacement Project, this effort involves replacing or modernizing many of the Coast Guard's 92 ships and 209 airplanes and helicopters used in search and rescue, drug interdiction, the interception of illegal immigrants, fisheries regulation, defense operations, and other at-sea operations. Teams of contractors are currently at work developing competing proposals for the Coast Guard's consideration. For initial planning purposes, the Coast Guard estimates the cost of the project to be \$9.8 billion (in constant dollars) over a 20-year period.

Because of the project's potential size, the Subcommittee on Transportation, Senate Committee on Appropriations, asked GAO to review the project's justification and the planning process being followed by the Coast Guard and to focus on the following questions:

- To what extent does the current justification for the Deepwater Project accurately depict the Coast Guard's need to modernize or replace ships and aircraft?
- To what extent are projected costs for the Deepwater Project consistent with the Coast Guard's overall budget for its capital projects?

Background

The Coast Guard's deepwater operations involve missions that cannot be carried out by shore-based small boats. These missions include search and rescue far out at sea, drug interdiction, the interception of illegal immigrants, and protection against illegal fishing operations. The Coast Guard currently has 43 cutters, 49 patrol boats, 71 surveillance aircraft, and 138 recovery helicopters for meeting these missions. In total, the Coast Guard estimates that it spent about \$1.3 billion in fiscal year 1997 in personnel, maintenance, and other costs related to these operations.

The Coast Guard began the Deepwater Project in 1996, following an internal assessment indicating that most of these ships and aircraft were at or near the end of their useful life. The agency hopes to replace or modernize its existing ships and aircraft, as well as make the use of innovative technology such as satellites and improved detection capabilities. The project is still in the early stages, but by 2002, the Coast Guard hopes to make final decisions about which ships and aircraft should be included. Initial planning estimates call for spending \$300 million starting in fiscal year 2001 and \$500 million a year over the next 19 years, although the Coast Guard acknowledges that the actual funding amount

depends largely on the funding priorities established by the administration and the Congress.

The Coast Guard is using a "system of systems" approach to determine the type and mix of ships and aircraft that will best accomplish its missions. Rather than considering replacement of an individual class of ships or aircraft, the agency is looking to develop a system that will integrate ships, aircraft, sensors, and communications equipment so that they can better operate with one another. The hoped-for result is a smaller number of ships and aircraft that will require fewer staff to operate. Teams of private contractors operating on a competitive basis will develop proposals for the system. The Coast Guard plans its own series of checks and reviews of these proposals to help ensure that the final result is the most effective and economical system of systems.

Results in Brief

Although the Coast Guard is correct in starting now to explore how best to modernize or replace its deepwater ships and aircraft, the Deepwater Project's only formal justification developed to date does not accurately or fully depict the need for replacement or modernization. This justification concluded that most deepwater ships and aircraft would need to be phased out starting in the next 2 to 9 years. However, subsequent analyses by the Coast Guard and others have shown that deepwater aircraft—and perhaps many ships—likely have a much longer life, assuming that maintenance and upgrades are carried out. The justification also asserted that these ships and aircraft were incapable of performing future missions or meeting future demand, but GAO was unable to validate these assertions from the information available. The Coast Guard withdrew the justification on the basis of concerns expressed by the Office of Management and Budget and is now developing more accurate and updated information. Several of these studies are still under way, even as contracting teams have already begun work on developing their initial deepwater proposals. Any delays in communicating this updated information to the contractors could adversely affect the quality of the proposals submitted.

While the Coast Guard's acquisition approach seems an appropriate way to avoid a costly one-for-one replacement of ships and aircraft, the agency could face major financial obstacles in proceeding with a Deepwater Project costing as much as initially proposed for planning purposes. At a projected \$500 million a year, expenditures for the project would take virtually all of the Coast Guard's projected spending for all capital

projects, which currently include the construction of new buoy tenders and motorized lifeboats. The Coast Guard expects more than \$165 million of the annual funding to come from new user fees for domestic ice-breaking and navigational services that the Coast Guard currently provides. However, the congressional subcommittees with jurisdiction over the Coast Guard's budget have expressed opposition to such fees, and the House and Senate have prohibited the Coast Guard from planning or implementing any new user fees. If hoped-for funding does not occur, the Coast Guard may be left having either to reduce the scope of the project or to stretch out the procurement period—that is, to buy items in smaller quantities over longer periods of time. However, many other government procurement projects have demonstrated that when agencies attempt to address a problem by stretching out the procurement period, administrative and other costs increase, resulting in lower value for the amount of money spent.

Principal Findings

Justification Did Not Accurately or Fully Depict Modernization or Replacement Needs

The Coast Guard's justification for the Deepwater Project, issued in 1995, underestimated the useful life of many ships and aircraft in the deepwater fleet. The projections of remaining useful life were based on estimates developed when these ships and aircraft were originally built. At that time, estimated service lives were generally 20 years for aircraft and 30 years for ships unless substantial modifications were subsequently made. However, reviews done since 1995 by the Coast Guard and others have shown that with proper maintenance and ongoing upgrades, many ships and aircraft can be used for a much longer period. A number of these upgrades are already under way or planned. For example, beginning with a \$4 million request in fiscal year 1999, the Coast Guard plans to begin improving communications and information flow for all aircraft. Similarly, the agency has requested about \$12.9 million in fiscal year 1999 for replacing surface search radars on many of its cutters. With upgrades like these, the useful service life of many of these assets, particularly aircraft, is extended 10 or more years beyond original estimates, according to the Coast Guard's evaluations.

Being able to use existing ships and aircraft for a longer time is of limited help if these assets cannot meet new capability needs or are too few in number to do the job. The Coast Guard's 1995 justification asserted that

current ships and aircraft lacked capabilities needed for future missions and could not satisfy the likely demand for services. However, the Coast Guard did not conduct a thorough analysis of the capabilities of current assets as required by the Department of Transportation's and the Coast Guard's acquisition guidelines, and GAO was unable to validate the information on which the estimated future demand for services had been based.

The Coast Guard and its parent agency, the Department of Transportation, now recognize that the 1995 justification did not do an adequate job of reflecting the condition of, capability deficiencies of, and future demand for ships and aircraft. Recognizing some of these same points, the Office of Management and Budget told the Coast Guard and the Department in January 1998 to withdraw the original justification. The administration plans to create a Presidential Roles and Missions Commission to review and validate the Coast Guard's roles and missions and issue a report in October 1999. The results of the Commission's work, coupled with the results of ongoing assessments of the condition and capabilities of existing deepwater ships and aircraft, will be used to prepare a revised justification, which the Coast Guard expects to issue in January 2000.

Even though the project's justification has been withdrawn, the Coast Guard is proceeding with the next phase of the acquisition process, in which three contractor teams will submit their competing versions of a proposed "blueprint" for the future deepwater system. GAO expressed concerns to senior Coast Guard and Department of Transportation officials about proceeding without a clear understanding of the condition and capabilities of ships and aircraft and of service demands envisioned in a well-substantiated justification. GAO noted that when the Coast Guard awarded contracts in August 1998 to three contractors to develop the proposal for the Deepwater Project, a number of key internal studies and assessments on the condition and capabilities of ships and aircraft were still being developed by the Coast Guard. For example, internal engineering evaluations of the condition of two classes of deepwater ships were under way and are scheduled for completion in mid-1999. Also, a study of the capabilities of the agency's deepwater ships and aircraft and a comparison with future requirements was under way; it is scheduled for completion in November 1998 at the earliest.

Without clear knowledge of whether current ships and aircraft are clearly deficient in their capabilities or when they are likely to reach the end of their useful life, contractors may develop proposals that call for a system

of ships and aircraft that is unnecessary or, if necessary, is brought into service too early or too late. This is of particular concern when the potential cost of new aircraft and ships is considered. Even if contractors receive this updated information, receiving it too late could mean that they would be disadvantaged in developing their "blueprint" proposals. For example, they may already have eliminated alternatives that, in the context of the additional information, are more cost-effective. While the Coast Guard recognizes that it is essential to provide contractors with updated information on the condition of ships and aircraft as soon as possible, it believes that it was also important to move forward with the contract awards because the contractors had already formed their teams and were ready to begin work and that long procurement lead times require the agency to initiate actions now without delay.

Some lessons learned from the development of the initial justification have applicability for future procurement efforts. The development of the initial justification for the Deepwater Project was the most complex mission analysis that the Coast Guard had ever undertaken, according to Coast Guard officials. They said that in many respects, the agency was learning as it went through the process. GAO identified three key factors that contributed to the Coast Guard's difficulty in dealing with this complex task. First, the agency had not yet developed ways to collect and analyze data essential for justifying such a large procurement project. For example, the agency had no systematic way to collect true operating and maintenance costs for its ships; such data would have been useful in comparing costs over time and demonstrating the agency's assertion that ships' maintenance and operating costs were rising significantly. Even when systems were in place to collect data on ships and aircraft, the analyses were sometimes not completed when scheduled because of budget constraints. Second, the Coast Guard's and the Department of Transportation's guidance for preparing mission analysis studies is limited for specifying acceptable methods to assess the condition of current ships and aircraft and for disclosing methodologies and data sources so that decisionmakers can consider any data limitations and minimize erroneous conclusions. Third, formal review mechanisms within the Coast Guard and the Department of Transportation did not recognize the data shortcomings of the justification. Little if any data verification was done; rather, reviewers presumed that the underlying data were accurate and complete. Taken together, these shortcomings raise questions about the accuracy and completeness of the data used to justify the Deepwater Project as well as the efficacy of the process for justifying future projects.

Fiscal Constraints Could Limit Deepwater Project's Funding

The Coast Guard's "system of systems" approach to the Deepwater Project seems logical as a way to avoid the costly one-for-one replacement of ships and aircraft, and its use of multiple contractors is an attempt to leverage technology and identify cost-effective alternatives. Nevertheless, finding funds for a project as costly as the one that the Coast Guard has initially proposed may be difficult for several reasons. One reason is that when full acquisition begins, the annual amount needed would be about equal to the Coast Guard's entire annual budget for capital projects as projected by the Office of Management and Budget. The Coast Guard has other capital projects under way or planned, such as replacing ships that maintain navigational aids and upgrading the capabilities of existing aircraft. Unless the Congress were to grant additional funds, which under existing budget laws, could mean reducing the funding for some other agency or program, these other capital projects could be affected.

Another reason why funding could be difficult is that about one-third of the Coast Guard's future budget for its capital projects is predicated on a proposed user fee for navigational and domestic ice-breaking services. These fees would be charged to ships, barges, and other vessels that rely on the Coast Guard's navigational aids and traffic systems in busy ports or that need ice-breaking services in the Great Lakes in order to operate during cold months. Such fees have proven controversial when proposed in the past, and the Subcommittees of the Senate and House Committees on Appropriations with jurisdiction over the Coast Guard's budget have cited their opposition to the new user fees. If user fees are not approved, the money would most likely need to come from additional appropriations. This would place the Deepwater Project in competition with other budget priorities, both inside and outside the Coast Guard.

Now that the Coast Guard has found that many of its ships and aircraft will have a longer useful life, funding needs for the Deepwater Project could lessen. If many ships and aircraft can be upgraded and used for a longer period of time, the project's needs—particularly in the short term—could be considerably less than the \$500 million a year that the Coast Guard has asked contractor teams to design their proposals around.

Recommendations

GAO recommends that the Secretary of Transportation direct the Office of the Assistant Secretary for Administration and the Coast Guard to expedite the issuance of information that the Coast Guard has developed or is developing on the condition and capabilities of ships and aircraft. To help ensure that future mission analysis studies on the Deepwater Project

or other major acquisitions are more accurate and complete, GAO recommends improvements in the Coast Guard's and the Department of Transportation's acquisition guidelines for evaluating the condition of assets, disclosing how information supporting acquisitions is developed, and reviewing acquisition proposals. Finally, to help ensure that planning for the Deepwater Project is conducted with the realities of competing projects and limited budgets, GAO also recommends that the Secretary direct the Commandant of the Coast Guard to evaluate whether contracting teams should be instructed to base their proposals on the assumption of a lower, more realistic funding level than \$500 million a year and submit the decision to the Department for review.

Agency Comments

GAO provided the Department of Transportation and the Coast Guard with a draft of this report for review and comment. The Department and the Coast Guard generally concurred with the information in the report, and the Department indicated that it would consider the report's recommendations. The Coast Guard generally concurred with the recommendations and said it will strive to improve the acquisition process. In addition, the Department and the Coast Guard provided several comments that clarified information on the Department's acquisition process, the cost of operating deepwater ships and aircraft, and the goals of the Deepwater Project, which we have incorporated into the report as appropriate.

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Abbreviations

AC&I	acquisition, construction, and improvements
ARSC	Aircraft Repair and Supply Center
DMAR	Deepwater Mission and Analysis Report
DOD	Department of Defense
DOT	Department of Transportation
GAO	General Accounting Office
OMB	Office of Management and Budget
SSMEB	Ship Structure and Machinery Evaluation Board

Background

Started in 1996, the Coast Guard's Deepwater Capability Replacement Project is potentially the most significant and largest acquisition project in the agency's history. The Coast Guard's deepwater missions—that is, those missions beyond the normal operating range of shore-based small boats—include such actions as enforcing fisheries laws, intercepting drug smugglers, and conducting search and rescue operations far out at sea. Cutters, patrol boats, airplanes, and helicopters are all critical to meeting these responsibilities. Through the Deepwater Project, the Coast Guard is considering how to best meet these missions in the future—and in the process, how to replace or modernize this fleet of ships and aircraft. The Coast Guard's preliminary estimates put the Deepwater Project's cost at \$9.8 billion over a 20-year period.¹

Current Deepwater Ships and Aircraft and Missions

What Are the Coast Guard's Primary Deepwater Ships and Aircraft?

The Coast Guard's deepwater missions are met by four classes of ships and four classes of aircraft, including the Coast Guard's largest cutters, airplanes, and helicopters. (See table 1.1.) The ships and aircraft are spread throughout the maritime areas of the nation, including the Pacific and Atlantic coasts, Alaska, Guam, and Hawaii.

¹The Coast Guard's projection is in constant 1998 dollars.

Table 1.1: Description of Deepwater Ships and Aircraft

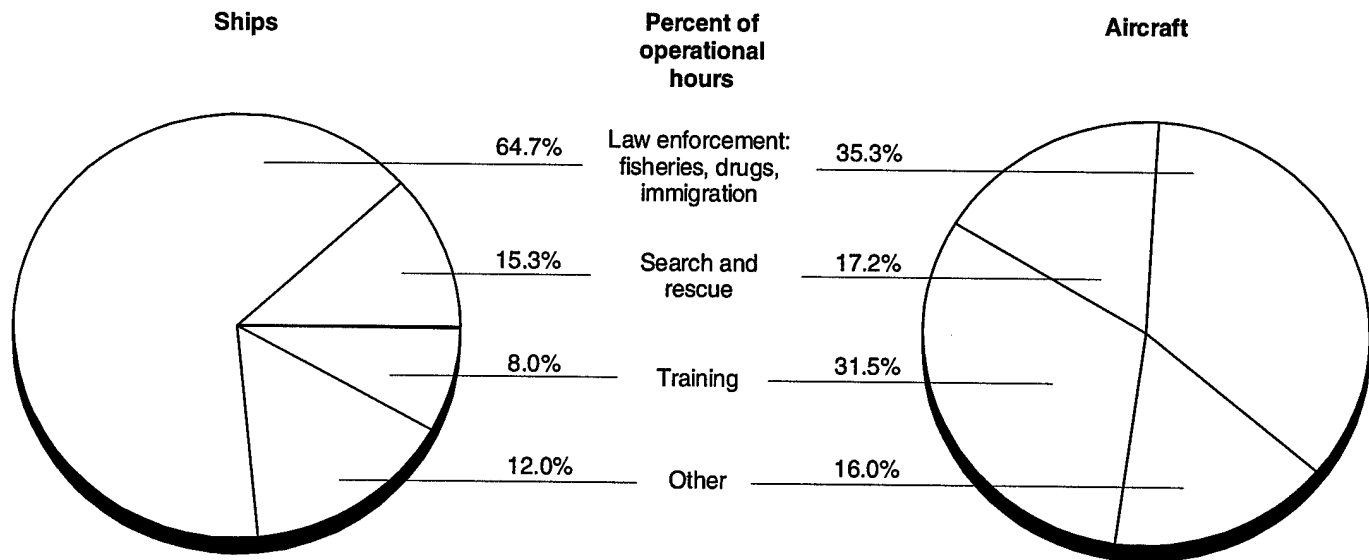
Type of asset	Number	Description
Ship		
378-foot high endurance cutter	12	This is the largest multipurpose cutter in the fleet. It has a planned crew size of 167, a speed of 29 knots, and a cruising range of 14,000 nautical miles. The Coast Guard operates it for about 185 days a year, and it can support helicopter operations.
270-foot medium endurance cutter	13	This cutter has a planned crew size of 100, a speed of 19.5 knots, and a cruising range of 10,250 nautical miles. The Coast Guard operates it for about 185 days a year, and it can support helicopter operations.
210-foot medium endurance cutter	16	This cutter has a planned crew size of 75, a speed of 18 knots, and a cruising range of 6,100 nautical miles. The Coast Guard operates it for about 185 days a year, and it can support operations of short-range recovery helicopters.
110-foot patrol boat	49	This patrol boat has a planned crew size of 16, a speed of 29 knots, and a cruising range of 3,928 nautical miles. The Coast Guard operates most for about 1,800 hours a year.
Total	92^a	
Aircraft		
HC-130 long-range surveillance airplane	30	This is the largest aircraft in the Coast Guard's fleet. It has a planned crew size of seven, a speed of 290 knots, and an operating range of about 2,600 nautical miles. The Coast Guard operates most of these aircraft for about 800 hours every year.
HU-25 medium-range surveillance airplane	41	This is the fastest aircraft in the Coast Guard's fleet. It has a planned crew size of five, a speed of 410 knots, and an operating range of 2,045 nautical miles. The Coast Guard generally operates it for about 800 hours a year.
HH-60J medium-range recovery helicopter	42	This helicopter is capable of flying 300 miles off shore, remaining on scene for 45 minutes, hoisting six people on board, and returning to its point of origin. The Coast Guard operates most for about 700 hours a year. It has a planned crew size of four, a maximum speed of 160 knots, and a maximum range of 700 nautical miles.
HH-65 short-range recovery helicopter	96	This helicopter is capable of flying 150 miles off shore. It has a crew allowance of three, a maximum speed of 165 knots, a maximum range of 400 nautical miles, and a maximum endurance of 3.5 hours. The Coast Guard operates most for about 645 hours a year.
Total	209	

^aTotal also includes a 213-foot medium-endurance cutter that was commissioned in 1944 and a 230-foot medium-endurance cutter that was commissioned in 1942. The 213-foot cutter has a planned crew size of 64, and the 230-foot cutter has a planned crew size of 106.

How Are These Ships and Aircraft Used?

The Coast Guard uses its deepwater ships and aircraft to carry out a number of maritime missions and responsibilities. On the basis of data for fiscal year 1997, the primary missions are in search and rescue operations and three categories of law enforcement: protecting fisheries, interdicting illegal migrants at sea, and controlling the flow of drugs. Together, these activities account for about 80 percent of the operational hours of deepwater ships and 50 percent of the operational hours of aircraft. (See fig. 1.1.)

Figure 1.1: Primary Uses of Deepwater Ships and Aircraft, Fiscal Year 1997



Source: GAO's analysis of the Coast Guard's data.

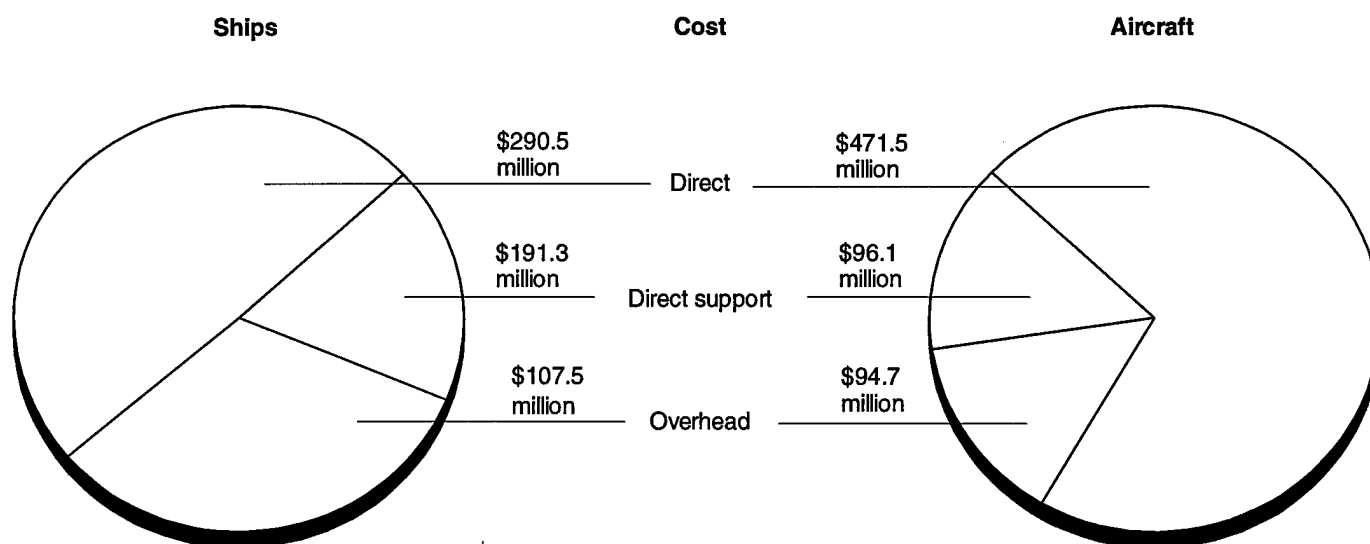
Usage varies considerably by the type of ship or aircraft. For example, 378-foot cutters are used mainly in fisheries enforcement, while 110-foot patrol boats are used mainly in search and rescue activities and drug control efforts. HC-130 aircraft have their greatest usage in fisheries enforcement, and helicopters spend much of their time in search and rescue activities and drug control activities. Appendix I provides a more detailed breakout for the usage of each type of ship and aircraft.

How Much Does It Cost to Operate and Maintain the Coast Guard's Deepwater Ships and Aircraft?

The Coast Guard estimates that it spent about \$589 million to operate its deepwater ships and about \$662 million to operate its deepwater aircraft in fiscal year 1997. The costs are broken out into three major areas: direct expenditures (e.g., the personnel costs of ship and aircraft operators), direct support expenditures (e.g., the cost of maintenance), and overhead (e.g., the cost of training). Direct expenditures account for the largest portion of operating costs. (See fig. 1.2.) Appendix II provides more

detailed information on the cost to operate and maintain each type of ship and aircraft.

Figure 1.2: Operational Costs for Deepwater Ships and Aircraft, Fiscal Year 1997



Source: The Coast Guard's Cost Accounting Model.

Deepwater Capability Replacement Project

The Deepwater Capability Replacement Project is intended as an integrated system of ships, aircraft, command, control, communications, intelligence, surveillance, and reconnaissance equipment to replace or modernize the Coast Guard's current assets. According to the Coast Guard's justification for the project, the existing deepwater ships and aircraft are at or approaching the end of their service life. The agency hopes to replace or upgrade them and end up—through the use of innovative technology, such as satellites—with a smaller number of ships and aircraft. By doing so, the Coast Guard hopes to lower total ownership costs² by acquiring a system of assets that requires fewer staff to operate and maintain. As presented, the project will potentially be the largest procurement effort in the Coast Guard's history.

²Total ownership costs include acquisition, operating, and support costs.

What Acquisition Process Does the Coast Guard Need to Follow?

As it proceeds with the Deepwater Project, the Coast Guard will be required to follow the acquisition process outlined in Office of Management and Budget (OMB) Circular A-109, which is the principal guidance for acquiring major systems in the federal government. To avoid the problems commonly experienced in acquiring major systems, such as cost overruns and delays, OMB Circular A-109 specifies five major phases that agencies must complete when making large acquisitions: (1) determine mission needs, (2) identify and explore alternative design concepts, (3) demonstrate alternative design concepts, (4) undertake full-scale development and limited production, and (5) commit to full production. To secure the involvement of the agency's top management in reviewing a project's progress, problems, and risks, Circular A-109 establishes a key decision point between each phase.³

The Coast Guard has already moved beyond the first phase of the A-109 process: it has examined mission needs as they relate to the need to replace or modernize its fleet of deepwater ships and aircraft. This first phase is critical because it justifies the project and identifies the deficiencies that need to be resolved. The Department of Transportation (DOT), the Coast Guard's parent agency, does not allow its agencies to request funds for a project unless DOT has reviewed and approved a well-documented statement of mission needs.

In the first phase of the Circular A-109 process, the Coast Guard assembled and obtained DOT's approval of a Mission Needs Statement. This statement is based on the Coast Guard's Deepwater Mission Analysis Report (DMAR), which was issued in November 1995.⁴ The DMAR determined that the Coast Guard's ships and aircraft were aging and that future demand exceeded the number of operational hours provided by the ships and aircraft. The DMAR also determined that capability improvements were needed in such matters as speed, boarding capacity, and the ability to classify targets. The DMAR concluded that as a result of these findings, there was a need to begin a project for acquiring new ships and aircraft.

³Key Decision Point 1 involves a review of the agency's Mission Needs Statement, which is an executive summary of the Mission Analysis Report. This decision point authorizes the agency to proceed into Concept Exploration, or an analysis of different concepts. Key Decision Point 2 validates the alternative concept(s) that the agency is proposing and authorizes the agency to proceed into demonstration and validation of the selected concept. Key Decision Point 3 validates the best design, verifies the resolution of technical issues, and authorizes the agency to proceed into full-scale development. After the agency builds and tests developmental models and prototypes, Key Decision Point 4 reviews the test and evaluation of the prototype, and authorizes production and deployment. DOT calls on its agencies to revalidate the mission's needs at each key decision point.

⁴In conducting the DMAR, the Coast Guard received assistance from the Naval Undersea Warfare Center and a private contractor.

The Coast Guard is now in the second phase, or concept exploration, of the Circular A-109 process. During this phase, the Coast Guard or its contractors will develop key program documents, such as project baselines, requirements documents, acquisition plans, and evaluation criteria. Alternative concepts for correcting the deficiencies identified in the DMAR must also be explored as part of this step.

For this acquisition, the Coast Guard is using a novel systems approach to examining its mission, its existing assets, and how best to accomplish its mission. Rather than using the traditional approach of considering the replacement of an individual class of ships or aircraft, the Coast Guard will use a "system of systems" approach that integrates ships, aircraft, sensors, and communication links together as a system to accomplish mission objectives. Through this approach, the Coast Guard hopes to avoid "stovepiping" the acquisition of ships and aircraft, which has led to a situation where they could not operate optimally together.

According to the Coast Guard, the process incorporates multiple controls, which will maximize existing resources in an efficient manner. These controls include the use of multiple teams of contractors in a competitive environment to identify the most cost-effective set of equipment. Also, the Coast Guard has hired an independent contractor, who is prohibited from gaining any potential production contracts, to provide a check on the results from the industry teams.⁵

How Does the Coast Guard Plan to Proceed?

From August 1998 through December 1999, the Coast Guard will pay three teams of contractors to develop competing proposals for the Deepwater Project. Their development contracts, costing about \$7 million each, call for the contractor teams to develop a proposal for maximizing the Coast Guard's ability to carry out its missions while minimizing total ownership costs.⁶ The proposals could include replacing existing ships, aircraft, and other equipment; upgrading them; or some combination of the two. Besides submitting their proposals, the contractors will be required to provide other products such as cost estimates for implementing their proposals, a schedule for acquiring or upgrading any new ships and

⁵The Coast Guard has selected the Center for Naval Analysis to conduct the independent analysis. According to the Coast Guard, the Center will consider the upgrade/modernization/replacement of existing ships and aircraft as well as the range of potential commercial technologies viable for the Deepwater Project. The Center will provide an objective perspective on deepwater concepts, a function that is intended to be a safeguard for the government, according to the Coast Guard.

⁶For fiscal year 1999, the Coast Guard requested \$28 million for the Deepwater Project, most of which was to be used to pay three teams of contractors to develop deepwater proposals.

aircraft, and an implementation plan for integrating the new or upgraded equipment into the Coast Guard.

Once the contractors submit their initial proposals, the Coast Guard will go through a series of steps designed to refine its concept of the system of systems. When the Coast Guard has selected a system that it wants from the proposals submitted, it will ask the contractors to submit additional final proposals for the system for the Coast Guard to evaluate. At the end of this process, the Coast Guard intends to award a contract to one of the contractor teams to build the system, which the Coast Guard calls the Integrated Deepwater System. The initial procurement of ships and/or aircraft is anticipated to begin in fiscal year 2002.

How Much Is the Project Likely to Cost?

In August 1996, the Coast Guard estimated that the cost of the Deepwater Project would range from \$7.25 billion to as much as \$15 billion. This estimate was based on replacing the existing fleet of 92 ships and 209 aircraft currently involved in deepwater missions. The Coast Guard cautioned that the estimate reflected a rough order of magnitude and that future estimates would be more accurate as the types and numbers of ships and aircraft are determined. The agency suggested that its estimate may portray the worst-case scenario because, through the use of technology, the Coast Guard intends to reduce the number of ships and aircraft required.

When the Coast Guard supplied guidance for contractors to use in deciding how to develop proposals for the new system, it proposed a budget target that was consistent with the August 1996 estimate. For planning purposes, the Coast Guard told contractor teams to develop proposals that assume a cost of \$9.8 billion over a 20-year period, or roughly \$500 million a year starting in fiscal year 2002. The agency cautioned, however, that funding levels are ultimately contingent upon congressional approval.

The Coast Guard is planning for substantial funding increases for the Deepwater Project over the next 4 years. In fiscal year 1998, the Coast Guard spent \$5 million on the Deepwater Project. The Coast Guard estimates that this cost will grow to an estimated \$500 million by fiscal year 2002. (See table 1.2.)

Table 1.2: Projected Funding for the Deepwater Project

Dollars in millions		
Fiscal year	Main tasks	Projected funding
1998	Concept exploration: Coast Guard issues request for proposal and awards contract to three teams of contractors.	\$5
1999	Concept exploration: Teams develop concepts and submit initial proposals. Coast Guard develops requirements documents, acquisition plans, and baseline.	28
2000	Concept exploration: Coast Guard determines final mix of ships and aircraft and prepares a second request for proposal.	19
2001	Concept exploration: Contractors prepare response to the mix of ships and aircraft prescribed by the Coast Guard. Coast Guard reviews proposals.	300
2002	Concept exploration: Coast Guard awards the contract for the next phase of the deepwater system—the demonstration and validation phase.	500

Objectives, Scope, and Methodology

The Subcommittee on Transportation, Senate Committee on Appropriations, asked us to review the Deepwater Project's justification and the planning process that the Coast Guard was following. We focused our review on the following questions:

- To what extent does the current justification for the Deepwater Project accurately depict the Coast Guard's need to modernize or replace its ships and aircraft?
- To what extent are projected costs for the Deepwater Project consistent with the Coast Guard's overall budget for its capital projects?

To answer the first question, we examined three main areas covered in the Deepwater Project's justification: the condition of current assets, projected capability needs, and projected demand for services. We analyzed the Coast Guard's documents depicting this need, such as the Deepwater Mission Analysis Report and the Mission Needs Statement, and compared the information that these documents presented with other Coast Guard data, such as engineering studies on the condition of Coast Guard ships and aircraft, planned upgrades for extending the service life of ships and aircraft, and records of actual usage. In those instances where the Coast Guard had relied on contractors to develop data for the project's justification, we interviewed contractor officials and obtained information on the procedures and methodology they used. We interviewed Coast

Guard and DOT acquisition and planning officials in headquarters to understand the process used by the Coast Guard to justify the Deepwater Project. We also interviewed (1) staff in the Coast Guard's Pacific Area office in Alameda, California; Atlantic Area office in Norfolk, Virginia; and the district office in Miami, Florida; (2) engineering and maintenance managers at the Coast Guard's headquarters; (3) Coast Guard staff in the Maintenance and Logistics Command in Norfolk, Virginia, and Alameda, California; (4) Coast Guard staff in the Engineering Logistics Center in Baltimore, Maryland; and (5) staff in the Coast Guard's Aircraft Repair and Supply Center in Elizabeth City, North Carolina, to obtain information on the agency's deepwater missions, the condition of ships and aircraft, and maintenance practices. We also reviewed OMB Circular A-109 and DOT's and the Coast Guard's policies on and procedures for major acquisitions.

Finally, we judgmentally selected locations for site visits that gave us the full mix of deepwater air and ship fleets and mission responsibilities. On the basis of this selection, we visited and interviewed ship crews in Seattle, Washington; Norfolk, Virginia; Miami, Florida; St. Petersburg, Florida; and Alameda, California, and air crews in Elizabeth City, North Carolina; Miami, Florida; Clearwater, Florida; and Kodiak, Alaska, to obtain information on the condition, capability, and operations of deepwater assets.

To answer the second question, we reviewed OMB's budget targets for the Coast Guard's budget for its capital projects, budget reports issued by the Congressional Budget Office, the Coast Guard's Capital Investment Plan, the Deepwater Project's funding and acquisition strategy, and other Coast Guard budget documents. We also interviewed Coast Guard, DOT, and OMB officials on the affordability of the Deepwater Project.

We performed our work from October 1997 through September 1998 in accordance with generally accepted government auditing standards.

The Coast Guard's Formal Justification Did Not Accurately or Fully Depict Modernization or Replacement Needs

When it initially proposed the Deepwater Project in 1995, the Coast Guard indicated that most classes of deepwater ships and aircraft would begin reaching the end of their service life within the next 2 to 9 years and would largely need to be phased out by 2010. Information developed since the initial proposal indicates, however, that many of these assets, particularly aircraft, have a service life that extends considerably beyond what the Coast Guard projected at the time. In the 1995 proposal, the Coast Guard also asserted that the capabilities of existing ships and aircraft were inadequate to meet current and future demand. We were unable to verify whether these assertions were correct because the Coast Guard did not have sufficient supporting evidence.

The Coast Guard and DOT now recognize that the 1995 justification did not adequately reflect the condition of deepwater ships and aircraft or their ability to meet future needs. The Coast Guard is conducting a number of internal studies that will update the condition and capabilities of its ships and aircraft as part of the next phase of the acquisition process. This phase began in August 1998, when the Coast Guard awarded contracts to three teams of contractors for developing competing proposals for the future deepwater system. Delays in providing updated information to the contractor teams could adversely affect the quality of the proposals submitted, in that, the teams could be disadvantaged in developing the most effective economical proposals for the Deepwater Project.

The 1995 project justification was inadequate in part because of the Coast Guard's relative inexperience in preparing a mission analysis this complex and in part because of certain weaknesses in the system for developing and approving such studies. More specifically, the system's weaknesses included not accumulating complete data, not having specific guidance for preparing the analysis, and not having a review process that was thorough enough to identify weaknesses in the methodologies and the data used.

Most Deepwater Ships and Aircraft Can Be Used Beyond Originally Estimated Service Life

The Coast Guard's justification of the need for the Deepwater Project was presented in the DMAR, issued in 1995.¹ The DMAR based its determination of how long ships and aircraft could operate on the estimate made when they were built or when they last underwent substantial modification. However, such estimates are not always reliable predictors of actual service life, according to industry sources and officials in the Coast Guard who operate and maintain deepwater ships and aircraft. Instead, the estimates are benchmarks signaling the need for a more thorough engineering reevaluation of the condition and remaining life of the ships and aircraft. Since 1995, a number of these reevaluations have been conducted. They show that for deepwater aircraft, service lives can be extended significantly beyond the initial estimates through a combination of maintenance, safety, and capability upgrades.² The reevaluations of deepwater ships have been more limited than reevaluations of the aircraft, but the ships studied thus far show that they are also likely to have a longer service life.

Justification for the Deepwater Project Called for Phaseout of Most Aircraft and Ships by 2010

According to the DMAR, most of the Coast Guard's deepwater aircraft and ships will have reached the end of their service life by 2010. The estimated service lives were generally 20 years for aircraft and 30 years for ships unless substantial modifications had been conducted. Because these ships and aircraft were acquired over a period of years, the DMAR indicated that the oldest of these would need replacement or modernization generally starting from 1998 through 2003. The estimates used were based on industry standards, according to a Deepwater Project official. The DMAR's depiction of the service life of each type of aircraft and ship is shown in table 2.1.

¹Although the Coast Guard has since withdrawn this document until it can be revised, we include a substantial analysis of it here because (1) analyzing the available justification was a major part of our congressional charge for this review, (2) understanding the document's shortcomings is important for assessing future revisions and for determining what changes to the process might be in order, and (3) DOT's and the Coast Guard's guidelines indicate that the purpose of concept exploration—the acquisition phase that the Coast Guard is in—is to explore alternative concepts for correcting the deficiencies described in the analysis.

²The Coast Guard stated that while the service life of ships and aircraft can be extended through maintenance and upgrades, there can also be risks associated with doing so, especially in terms of costs and capability. According to the Coast Guard, the current phase of the project will determine whether and how long it is cost-effective to extend the service life of ships and aircraft.

Chapter 2
The Coast Guard's Formal Justification Did
Not Accurately or Fully Depict
Modernization or Replacement Needs

Table 2.1: Phaseout of Aircraft and Ships as Shown in the DMAR

Type of asset	Years acquired	Estimated service life in years	Phaseout period shown in DMAR
Ships			
378-foot high-endurance cutter	1967-72	33-39 ^a	2003-2007
270-foot medium-endurance cutter	1983-91	30	2012-2020
210-foot medium-endurance cutter	1964-69	36-45 ^b	2002-2011
110-foot patrol boat	1986-92	20	2005-2012
Aircraft			
HC-130 long-range surveillance airplane	1972-87	20	1998-2008
HU-25 medium-range surveillance airplane	1982-84	20	2002-2004
HH-60J medium-range recovery helicopter	1990-96	20	2010-2015
HH-65 short-range recovery helicopter	1984-89	20	2005-2009

^aService life is based on the date of renovation and modernization plus 15 years.

^bService life used is based on the date of major maintenance plus 15 years.

Reevaluation Shows That Aircraft Have Longer Service Lives

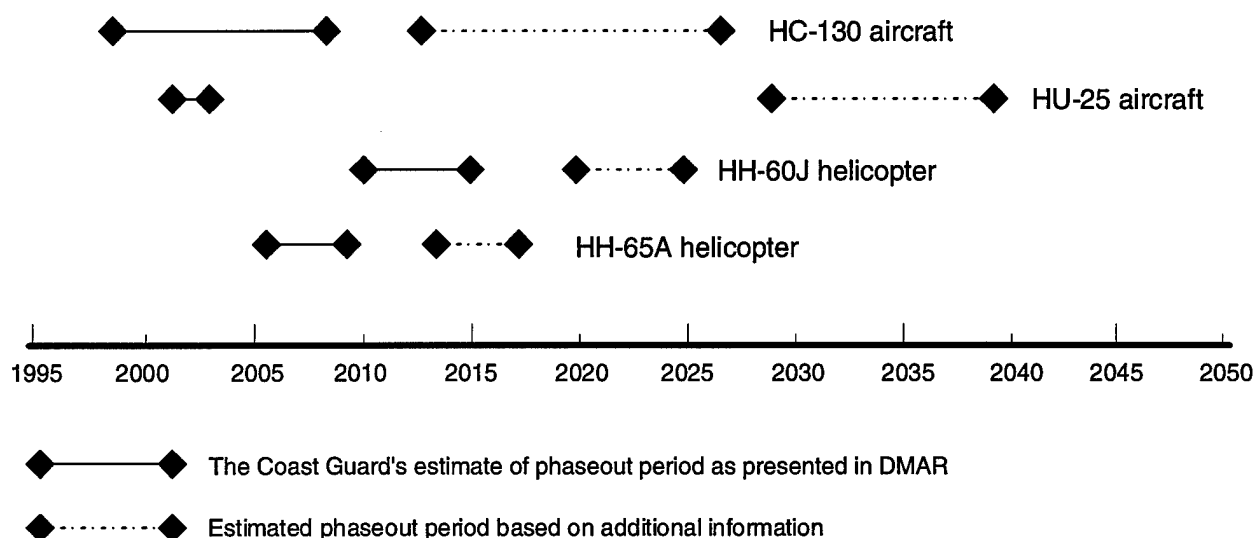
Studies by the Coast Guard and other independent groups³ show that Coast Guard aircraft can operate significantly beyond their 20-year design life, assuming that proper maintenance and upgrades are done. Since the DMAR was issued, the Coast Guard has completed a new study of its aircraft. A draft of this study, prepared in May 1997, concluded that the Coast Guard's aircraft are capable of operating safely until at least 2010 and likely beyond.⁴ This conclusion substantially affects the estimated service life of aircraft presented in the DMAR. As figure 2.1 shows, on the basis of estimated service life alone, no aircraft would need to be replaced

³The Coast Guard contracted with CAE Aviation Ltd. to perform an engineering study on the condition of HC-130 aircraft and to develop options for extending the life of the fleet; the report was issued on January 10, 1997. Aircraft manufacturers Sikorsky and Dassault conducted studies of the HH-60J and HU-25, respectively.

⁴The draft study, entitled "Near Term Support Strategy," was initiated as part of the Coast Guard's internal budgeting process and conducted by the Coast Guard's Aeronautical Engineering Division. The study was based on consultations with manufacturers of the aircraft and with Department of Defense agencies operating similar aircraft, as well as consultations with Coast Guard headquarters aircraft engineers and staff at the Aircraft Repair and Supply Center (the Coast Guard's maintenance depot facility). In consulting with these sources, the Coast Guard was able to identify the factors that would cause an aircraft to reach the end of its service life the soonest and what it would take to extend its service life. The study was approved as a final report on August 19, 1998.

before 2010, and the final phaseout of most types of aircraft could stretch until 2020 and beyond.

Figure 2.1: Comparison of Phaseout Periods Shown in the DMAR and Projected by Subsequent Reevaluations



The study's conclusion was predicated on three main factors.

- Condition of aircraft is good—and independently corroborated. According to the Coast Guard's engineering officials, outside assessments have been conducted on three of the four types of aircraft. Like the Coast Guard's assessment, these independent studies found the aircraft to be in good condition and capable of operating far beyond the estimates used in the DMAR.
- Capabilities of existing aircraft can be upgraded to better meet the Coast Guard's missions. The study identifies several projects that can further the life or upgrade the capability of each aircraft. For fiscal year 1999, for example, the Coast Guard is requesting \$37 million in acquisition, construction, and improvements (AC&I) funding for projects to upgrade individual types of aircraft.⁵ In addition to projects related to specific aircraft, other current AC&I projects are improving the flow of

⁵These appropriations fund AC&I of ships, aircraft, and other equipment.

communication and information for all aircraft—for example, a \$21.5 million project is providing secure and reliable communications for command and control through commercial satellite communications.⁶ In all, according to a Coast Guard engineering official, the study identified about \$200 million in AC&I projects benefitting deepwater aircraft. (For more detailed information on the projects, see app. III.)

- A rigorous maintenance program is in place. According to the Coast Guard Aircraft Repair and Supply Center (ARSC) official responsible for maintaining the agency's aircraft, a rigorous maintenance program for aircraft, as well as periodic assessments of the condition of each aircraft, allow the aircraft to operate beyond original service life estimates. The Coast Guard uses a two-level maintenance system that includes maintenance performed at the air stations (servicing, component replacement, and inspection for corrosion and fatigue cracks) and more extensive maintenance performed periodically at the ARSC,⁷ which can take several months to be completed.

At the four air stations we visited, we asked 37 Coast Guard flight crew members what they thought about the condition and capability of their aircraft and their ability to carry out their missions. (These flight crews also conduct maintenance on their own aircraft.) Overall, most crew members said that they were satisfied with the condition and performance of their aircraft but noted shortcomings in sensors and communication equipment that hampered their ability to fully carry out their missions. For example, Coast Guard crew members stated either that existing night vision capabilities are totally absent or that they are making due with equipment designed for other purposes.

Limited Data Obtained Suggests That Ships May Also Have a Longer Service Life

Although the Coast Guard has not yet performed all of the engineering studies necessary to evaluate the entire fleet of deepwater ships, recently completed assessments of some of its deepwater ships show that they can operate beyond the service life estimates used in the DMAR. These engineering assessments, performed from 1994 through 1997 by the Coast Guard's Ship Structure and Machinery Evaluation Board and referred to as SSMEBS, have been conducted for a limited number of three of the four types of ships. Each has shown that the ships are in good condition and

⁶Of the \$21.5 million for this project, \$4 million was requested for fiscal year 1999, \$5 million was planned for fiscal 2000, and \$12.5 million was planned for future years.

⁷The Coast Guard performs major overhauls of the two types of helicopters and HU-25 medium-range surveillance airplanes at its ARSC, and it contracts out the overhaul maintenance of HC-130s.

that, in two of three instances, the service life estimates are longer than those presented in the DMAR.

The Coast Guard established the SSMEBS as a way of assessing the condition of ships and determining if their service life can be extended. The assessments are supposed to be conducted on one or more ships of each type 10 years after the commissioning of the lead ship and at each 5-year interval thereafter.⁸ SSMEBS on the 378-foot high-endurance cutter have not been performed because of budgetary constraints, according to the Coast Guard's Chief Naval Engineer.⁹ In light of information needs for the Deepwater Project, the Coast Guard is initiating assessments on one 378-foot and one 270-foot cutter and expects to complete them in fiscal year 1999.

The most recent SSMEBS or other evaluations have indicated that the service life of the evaluated vessels is longer than that indicated in the DMAR.¹⁰

- 270-foot cutter. In 1994, an SSMEB showed the evaluated cutter to be in excellent condition and a potential for extending the cutter's service life through the replacement of equipment or modifications to be done during maintenance periods. A recommended mid-life maintenance, similar to that done on the 210-foot cutters, would add an additional 15 years to the service life of the vessels—well beyond the service dates shown in the DMAR.
- 210-foot cutter. SSMEBS conducted on two cutters in 1997 showed that their service life was longer than that shown in the DMAR (at least 2 additional years for one cutter evaluated and at least 5 years for the other).
- 110-foot patrol boat. The three SSMEBS conducted on these patrol boats since 1995 were consistent with the service life estimates used in the DMAR. However, other studies conducted by the Coast Guard have estimated the remaining service life to be up to 6 years beyond the dates cited in the DMAR.

⁸An SSMEB consists of a review of the repair history of a class of cutters, an assessment of the future supportability of the main propulsion, auxiliary, and prime mission equipment on that class of cutter, and a thorough physical examination of the hull, engines, and auxiliary equipment.

⁹Although no 378-foot cutter has recently received an SSMEB, the service life of these ships has been studied. In 1990, officials in the Coast Guard's Cutter Division estimated that the 378-foot cutters had a service life that could be extended from 2007 through 2012, or 4 to 5 years longer than the service life estimates used in the DMAR.

¹⁰An SSMEB's determination that a ship's service life can be extended by a certain period (e.g., 5 additional years) should not be taken to mean that the ship will necessarily reach the end of its useful life when the 5-year period has ended. A subsequent SSMEB will determine if the useful life can be extended further.

As with aircraft, maintenance and upgrades are key factors that help extend the service life of Coast Guard surface vessels, according to Coast Guard naval engineering officials. A number of upgrades are scheduled, and the Coast Guard takes preventive and corrective action on a continual basis to ensure that a vessel's condition is maintained.¹¹ For example, the Coast Guard has been replacing surface search radars on many of its cutters since 1994 and has requested \$12.9 million for fiscal year 1999 to continue this project.

During the course of our work, we visited cutter crews at four locations to discuss the capabilities of the Coast Guard's deepwater ships and specific on-board systems for such functions as detecting and classifying targets and communicating with other Coast Guard assets and land units. Like their aviation counterparts, most of the ships' crew members were satisfied with the performance of their vessel. However, many said that outdated sensors and communication equipment limited their abilities to fully perform their missions. Similar to Coast Guard pilots, crew members cited the need to improve night vision capabilities, which could improve target detection capabilities and the ability of helicopters to land on cutters at night. Also, they noted the difficulty of launching small boats from cutters during rough seas, which could be improved if the ships had better launching systems; the inefficiency of the gas turbine engines on the high-endurance cutters was mentioned as well.

Remaining Service Life of Ships and Aircraft Merits Careful Study

As ships and aircraft continue to age, rising operations and maintenance costs can become one factor in deciding whether to keep equipment or replace it. For example, studies have shown that the cost to operate and maintain aircraft can rise as they age. This occurs as equipment wears out and needs to be replaced or maintained more frequently. So far, the studies showing that the agency's ships and aircraft have a longer life than originally thought have presumed that proper maintenance and upgrades will be carried out. Several of the studies note that upgrades are more likely to be a lower-cost solution than replacing the entire ship or aircraft. As the Coast Guard proceeds with the Deepwater Project, it is developing

¹¹Vessel maintenance generally occurs at three levels—organizational, intermediate, and depot. Organizational-level maintenance is conducted by the assigned crew of the unit or by shore-based teams assigned to a group of vessels. It generally takes place on board ship or at Coast Guard facilities, such as boat stations or engineering support units. Intermediate-level maintenance is performed by Coast Guard maintenance staff with specialized resources or skills unavailable to the unit. Depot-level maintenance involves major overhauls, major hull repairs, or major system overhauls and is done at commercial shipyards or at the Coast Guard's yard about once every 4 years for cutters and once every 3 years for patrol boats.

information on the cost to operate and maintain its ships and aircraft over time.¹² Such information may provide the agency with additional insights on the most cost-effective solutions to carrying out its deepwater missions.

Acquisition Requirements for Demonstrating a Capability Gap Not Met

DOT's and the Coast Guard's acquisition requirements emphasize the need to document any gaps between the capability of current ships and aircraft and future performance expectations as part of the mission analysis. Specifically, the Transportation Acquisition Manual says that a mission analysis "identifies capabilities needed to perform required functions, highlights deficiencies in the functional capability, and documents the results of the analysis." Likewise, the Commandant's instruction setting the Coast Guard's policy on mission analysis states that mission analysis is to "identify deficiencies in current and projected capabilities." The instruction also states that mission analysis should include a "baseline of current mission performance and asset capabilities." However, we found that the justification presented in the DMAR was not backed up by quantifiable analyses demonstrating that a capability shortfall existed.

While the DMAR asserted that a gap in capabilities existed, we found no evidence that the Coast Guard had conducted an analysis comparing the current capabilities of aircraft and ships with current and future requirements, as required by DOT's and the Coast Guard's guidance. For example, the DMAR stated that "A comparison between mission requirements and current asset capabilities indicate that Coast Guard assets are very capable, but will not meet all requirements for the future." According to the Coast Guard official heading the team responsible for preparing the DMAR, the Coast Guard did not perform any specific analyses or comparisons to support this statement. Rather, the statement was based on an informal comparison conducted by the project team and based on its experiences with the deepwater aircraft and ships.

Coast Guard officials told us that they plan to complete a comparative assessment of the current capabilities and functional needs of the future deepwater system by November 1998.¹³ Coast Guard officials told us that

¹²Beginning in fiscal year 1997, the Coast Guard began developing a Fleet Logistics System to address, in part, the absence of integrated cost-accounting and historical data and management information for the maintenance, repair, and modernization of its ships. The Coast Guard plans to complete this project in fiscal year 2000.

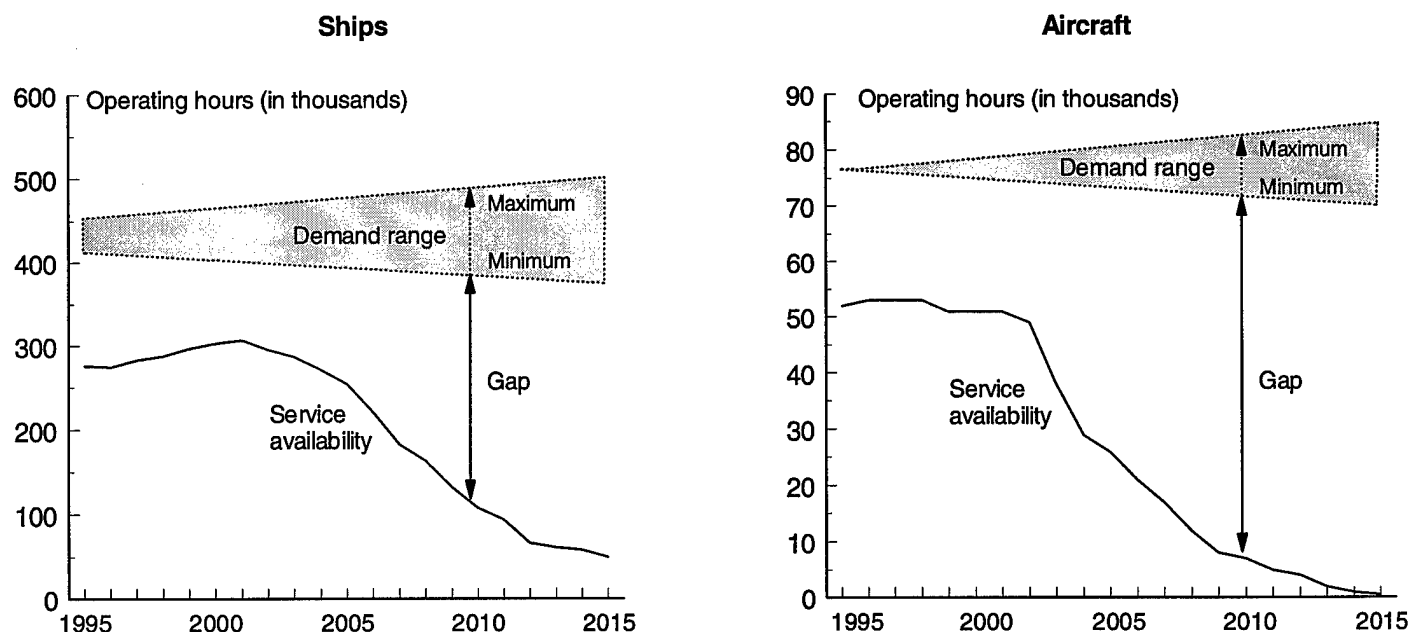
¹³Since the DMAR was issued, the Coast Guard has defined its functional requirements for the future system. The future functional requirements for deepwater missions were defined in the System Performance Specifications, which provide a baseline performance specification for the Coast Guard's Integrated Deepwater System and are included in the request for proposal.

the proposed comparative assessment would involve a baseline determination of current deepwater ships and aircraft and an evaluation of how well they meet future functional requirements. As of August 1998, a contractor for the Coast Guard had collected data on the performance standards and measures for deepwater missions, as well as the capabilities of ships and aircraft. These data will be used in the comparative assessment to be conducted by the Coast Guard.

Shortfalls in Meeting Demand for Services Could Not Be Verified

DOT's and the Coast Guard's acquisition requirements call for developing an estimate of the future need and demand for major systems before they request funds from the Congress. According to the DMAR, the Coast Guard's deepwater ships and aircraft were able to meet only about one half the actual need for surface and air hours. In future years, as existing ships and aircraft reach the end of their useful life, the gap between available resources and actual need was projected to become even greater. (See fig. 2.2.)

Figure 2.2: Demand Gap Presented in Initial Deepwater Project's Justification



Source: DMAR.

The unmet need, according to the Coast Guard, affects primarily the drug interdiction and fisheries missions. For example, the Coast Guard said that it had to reduce drug interdiction missions in the Caribbean below desired levels and that it had to reduce fisheries patrols in areas off the Northeast coast that had been closed to fishing. The unmet need also reflected cutting operations in low-priority areas; areas that would typically receive little attention would not be patrolled.

Projected Demand for Coast Guard Ships and Aircraft Is of Unknown Reliability

We attempted to verify the Coast Guard's estimates of surface and aviation hours needed for deepwater law enforcement missions, which constitute over 95 percent of the total estimated mission-related hours for ships and about 90 percent of the total estimated mission-related hours for aircraft.

The Coast Guard and its consultant who studied this area could not provide us with the information they used to make these estimates.

Estimates for Ships

We could not verify the reasonableness of surface demand hour estimates because the data sources used were not documented or available. The Coast Guard had contracted with a private company to develop the demand analysis. Contractor officials responsible for the analysis told us the analysis was based on data obtained from Coast Guard officials. However, the contractor did not document any details regarding the data, such as which Coast Guard officials provided the data and what they were based on.

Coast Guard officials told us that the demand analysis was based on two main sources: fiscal year 1992 data from the Law Enforcement Information System and information supplied by working groups at the Coast Guard's headquarters, who based their estimates on recent field experience. To verify these data, we judgmentally selected 24 data items and asked Coast Guard officials to provide support for them. The Coast Guard was unable to provide us with sufficient support for any of the 24 items.

One of the data items that we examined—the estimated demand for drug interdiction hours—provides an example of the lack of clearly verifiable information, as well as an example of the possible errors introduced into the analysis. The demand analysis based its estimates of drug interdiction hours, in part, on intelligence reports showing 400 suspected narcotraffickers per year in one district. Coast Guard officials were unable to provide support for these data and said that they presumed that the analysts had access to intelligence lists and that they had counted approximately 400 different suspect vessels for fiscal year 1992. In addition, we found that the estimated surface demand hours for drug interdiction may have been substantially overstated because the number of possible suspect vessels may have been double-counted. For example, two Coast Guard performance standards task the Coast Guard to (1) board 10 percent of the targets of interest within high-threat areas and (2) apprehend, assist in the apprehension of or hand-off to another counter-drug law enforcement agency, every known narcotrafficker intercepted. To accomplish both standards, the Coast Guard must identify and board vessels. However, the contractor did not adjust its methodology to eliminate the problem of identifying and boarding the same vessel twice. Our analysis indicates that the resulting overstatement could be as much as 21 percent of the total demand estimate for drug interdiction, depending on the extent of the duplication.

Estimates for Aircraft

We could not verify the reasonableness of the Coast Guard's estimate of needed aircraft hours because the source and quality of the data used in the study were not fully supported. The estimate was based on a 1992 Coast Guard study that used fiscal year 1991 aviation data. The Coast Guard told us that the fiscal year 1991 aircraft usage totaled about 40,000 hours. However, the 1992 study indicated that about 75,000 hours were needed—35,000 more than could be supported by actual usage on the basis of the prior year's usage. Coast Guard officials were unable to provide support for the additional 35,000 hours other than to explain that for its 1992 study, the Coast Guard directed its district offices to base their estimates of needed aircraft hours on historical data for fiscal year 1991 and to add hours for unmet and future requirements. The district offices did not provide support for their unmet and future requirements.

**Key Assumption Not
Disclosed for Demand
Estimates**

The Coast Guard's guidelines for mission analysis require the disclosure of assumptions that underlie the analysis. However, the Coast Guard did not disclose a key assumption in the analysis that the demand for services was based on the Coast Guard's having unlimited resources to accomplish every task within its missions. In other words, the Coast Guard based the demand on fully meeting every responsibility assigned to the agency and with the assumption that it would have enough staffing, support, and equipment to meet all of these responsibilities.

A Coast Guard official said that the agency assumed unlimited resources because the agency sets its sights on providing a high level of service and strives to achieve it. Not making this assumption clear, however, can present a distorted picture of the demand for services. While the Coast Guard may believe it is appropriate to base its estimates on the underlying assumption that unlimited resources will be available, not disclosing this fact can leave decisionmakers with an unclear picture of what is being presented.

**Many Data Issues
Remain Unresolved**

In January 1998, the Office of Management and Budget told the Coast Guard and DOT to withdraw the DMAR and the Mission Needs Statement as justification for the Deepwater Project. This occurred because OMB officials were concerned that more data were needed before the Coast Guard formally submitted information to contractor teams on the extent of the Coast Guard's resource needs. To address this concern, the administration plans to create a Presidential Roles and Missions Commission to review and validate the Coast Guard's roles and missions.

More specifically, the Commission will identify the Coast Guard's statutory and regulatory missions and evaluate whether the agency continues to be the most appropriate organization to carry out these assignments.¹⁴ The results of the Commission's work would then be used as input to the project.

The Coast Guard plans to replace the DMAR after the Presidential Commission completes its work in October 1999. As of August 1998, the Coast Guard planned to revise the DMAR by January 2000. In the meantime, the Coast Guard's plans call for the contractors themselves to assess the condition of ships and aircraft as part of the next phase of the acquisition process. In August 1998, the Coast Guard awarded contracts to three contracting teams to develop proposals for an integrated deepwater system. By February 1999, these contractors must submit a description of the alternatives they are considering for the system. By December 1999, they must submit their proposal for the system, including life-cycle cost estimates of the system and its assets and an implementation schedule for acquisition and deployment.

We expressed concerns to senior Coast Guard and DOT officials about proceeding without the kind of clear understanding of the condition and capabilities of vessels and aircraft and service demands envisioned in a well-substantiated DMAR. Our concern mirrored a similar concern expressed in a November 1997 internal Coast Guard study, which concluded that the DMAR and the Mission Needs Statement needed to be revalidated. According to a December 1997 memo from the Assistant Commandant for Operations, "Industry will extensively use these documents . . . to develop a system of systems and it is critical that our projected missions and the stated levels/standards of performance are still accurate."

Without clear knowledge of whether current ships and aircraft are clearly deficient in their capabilities or when they are likely to reach the end of their useful life, contractors may develop proposals that call for buying ships and aircraft that are unnecessary or, if necessary, are brought into service too early or too late. This is of particular concern when the potential cost of new aircraft and ships is considered. Even if contractors receive this updated information, receiving it too late could mean that they would be disadvantaged in developing workable proposals for the next step of the acquisition process. For example, they may already have

¹⁴According to the Coast Guard, the Commission will distinguish which of its roles, missions, and functions might be (1) added or enhanced, (2) maintained at current levels of performance, or (3) reduced or eliminated.

eliminated alternatives that, in the context of the additional information, are more cost-effective.

Coast Guard officials agreed that it is essential to provide contractors with updated information on the condition of ships and aircraft as soon as possible, but they said that it was also important to move forward with the contract awards because the contractors had already formed their teams and were ready to begin work. They noted that long procurement lead times require that the agency initiate actions now without delay. According to agency officials, the Coast Guard has learned the importance of having sufficient time for advance planning to ensure that it has adequate ships and aircraft to accomplish its mission while ensuring that they are available at minimal cost. Coast Guard officials also said they plan to provide the information on the condition and capabilities of its ships and aircraft as contractors proceed with their work.

What follows is a listing of the relevant types of information, together with Coast Guard officials' statements about the degree to which contractors would be provided with such information during this phase of the acquisition process.

Studies of the Useful Life of Aircraft and Ships

The Coast Guard plans to provide contractor teams with available data on its existing ships and aircraft at a meeting with them in September 1998, according to Coast Guard officials. As of August 1998, several studies of ships had not been finalized. The specific studies under way or completed and their status follow:

- Internal evaluation of aircraft (the Near Term Support Strategy study). This study, which establishes a baseline of the condition of all four types of deepwater aircraft, was essentially completed in May 1997 and issued in final form on August 19, 1998. A Coast Guard Deepwater Project official said that project officials expected to provide contractors with the results of this study in September 1998. He said the contractors will also be able to visit the Aircraft Repair Supply Center and other Coast Guard locations to obtain additional information on aircraft condition.
- Internal evaluations of ships (SSMEBS and related studies). SSMEBS and related studies conducted since the DMAR was published provide the most up-to-date indications of vessels' conditions. In addition to the SSMEBS and studies already completed, the Coast Guard's Boat Engineering Branch plans to issue an engineering report soon on the remaining useful service life of the 110-foot patrol boats. A Coast Guard Deepwater Project official

said that the completed SSMEBS and studies would be released to contractors when completed. Several additional SSMEBS are scheduled for completion in June 1999, well after the contractors have started their work. The Coast Guard official added that for SSMEBS under way, as well as for any other information on ships' conditions, contractors will be able to visit Pacific and Atlantic Logistics Centers to obtain their own information.

Studies of the Capabilities of Aircraft and Ships

During our review, the Coast Guard began planning to study the capabilities of its current deepwater aircraft and ships and comparing these capabilities with the future functional requirements of the deepwater system. This work will be done by a private contractor. The information from such a study would appear to be critical to contractors in developing proposals for the most cost-effective way to fill such gaps. This analysis is scheduled for completion in November 1998. A Coast Guard Deepwater Project official told us that project officials plan to make the study and its underlying data available to contractors at that time.

Studies of Future Demand

As part of the ongoing planning for the Deepwater Project, the Coast Guard attempted to recalculate its estimates of future demand for services. According to the staff involved, the reliability of the underlying database did not permit such a recalculation. OMB expects that the Presidential Roles and Missions Study will be issued by October 1999 and that it will provide additional information on the future demand for Coast Guard services. A Coast Guard Deepwater Project official said that the Coast Guard plans to recalculate the demand estimate as part of revising the DMAR. According to the Coast Guard's current plan, as of August 1998, the DMAR and the Mission Needs Statement will not be revised until January 2000, or after contractors have submitted their initial proposals on the project.

Presidential Commission Study on Roles and Missions

Decisions made by the Presidential Commission formed for studying the Coast Guard's roles and missions could also have a direct bearing on the eventual shape of the Deepwater Project. The Commission was proposed out of concern that more information was needed on the Coast Guard's resource needs. However, by July 1998, the future of the proposed Commission had become more uncertain. In that month, the Subcommittee on Transportation, House Committee on Appropriations, expressed concerns about the Commission and proposed replacing it with a blue-ribbon panel to study not only the Coast Guard's roles and missions

but its capital needs as well. But even if the Presidential Commission is formed in the fall of 1998, the results of its work are not anticipated until at least October 1999. As a result, the results of the Commission's study will not be available for the contractors to consider as they develop their blueprints for the agency's future deepwater system. The timetable for a report by the congressionally proposed blue-ribbon panel shows that its report would be issued by January 2001.

Better Acquisition Guidance and Review Could Help Avoid Similar Problems in the Future

A number of factors contributed to the data weaknesses we noted in the DMAR and ultimately resulted in the Coast Guard's proceeding with the project before it had established a fully sound justification. One reason, Coast Guard officials pointed out, was that nothing as comprehensive as the Deepwater Project had ever been covered in a mission analysis report. For example, it was the first time the Coast Guard had dedicated staff to produce a mission analysis, and it was the first time the Coast Guard had ever tried to document the demand for the ships and aircraft being studied. In many respects, the agency was learning as it went through the process, since the staff were not familiar with mission analysis techniques.

We also noted weaknesses in DOT's and the Coast Guard's internal guidance for preparing mission analyses and the processes for reviewing such documents. Three aspects of the process merit attention: more specific requirements and guidance for assessing the condition of current assets, more thorough disclosure of how information supporting the justification was developed, and more structured and thorough review of the project justification itself.

Guidance for Assessing Condition of Current Assets Is Limited

DOT and Coast Guard policies provide limited guidance for assessing current assets as part of developing a mission analysis report, such as the DMAR, on which the project's justification is based. The closest thing to a requirement for assessing the condition of current assets is a statement in the DOT Acquisition Manual that the mission analysis should be "based on the continuous monitoring of performance, supportability, and maintenance trends of operational systems to determine when they will no longer be able to meet current or emerging needs." The Coast Guard's guidance generally outlines the types of analyses and information to be included in the mission analysis but does not specifically mention an assessment of the current condition of the assets scheduled for replacement.

**Disclosure of Data Sources
and Methodologies Was
Largely Absent**

In reviewing the information on which the decisions about an acquisition as large as the Deepwater Project will be based, it is important that decisionmakers in the Coast Guard and the DOT are able to understand how planners arrived at their conclusions. For example, it is important for decisionmakers to know about any limitations in the approach for collecting information, limitations in the reliability of the underlying data, or other factors that would affect the credibility of the information in supporting a major capital expenditure. Such explanations of how planners arrived at their conclusions is an important part of minimizing the possibility for errors and erroneous conclusions.

The Coast Guard's and DOT's guidance for developing a mission analysis are silent on disclosing methodologies and data sources. We found several instances in which not knowing this information could result in assigning too much credibility to the conclusion being drawn. For example, in its presentation on capability shortfalls, the DMAR stated that deepwater ships and aircraft had capability deficiencies but did not explain the information on which this conclusion was based. According to a Deepwater Project official, to make this assertion, the Coast Guard relied on the opinions of a few personnel who were working on the Deepwater Project. No database was developed, nor was any systematic approach used to collect information on capability deficiencies from a cross-section of personnel who actually operated and maintained these assets. Similarly, the DMAR did not include an explanation for how planners had determined the substantial gap between future demand and current operating levels, which was presented in the DMAR. In developing this estimate, planners relied in part on a survey of a small number of Coast Guard units—not enough to provide statistical validity. This limitation was not disclosed.

We recognize that in some instances, it may be difficult to develop information as thoroughly or systematically as might ideally be desired. However, ensuring that explanations for how information was obtained and what information is used for conclusions would provide a more solid foundation for the Coast Guard when it develops mission analysis reports in the future.

**Review at Agency and
Departmental Levels Did
Not Disclose Data
Problems**

After the justification for the Deepwater Project was developed, it went through a number of reviews inside and outside the Coast Guard. None of these reviews included any systematic checks of the underlying information. As a result, these reviews did not disclose the data weaknesses that we later found, including the fact that some basic

acquisition requirements—such as documenting the capability deficiencies of current assets—were not met. For example, the DMAR's primary internal review, which was coordinated by the Director of Resources' office, involved a review of the document by a number of senior managers within the Coast Guard. However, this review did not involve any verification of the underlying data on which the DMAR's findings and conclusions were based.

This same focus was found in additional reviews that took place. Before an acquisition as large as the Deepwater Project can proceed past the first main decision point and into the concept exploration phase of OMB Circular A-109's acquisition process, the Coast Guard's System Acquisition Manual calls for it to be reviewed by two councils—one within the Coast Guard (the Coast Guard Acquisition Review Council) and one within DOT (the Transportation Systems Acquisition Review Council). The Coast Guard Acquisition Review Council is an advisory body on major acquisitions for the agency's acquisition executive. It reviews major acquisitions at each key decision point and serves as a forum for discussing project-related issues and resolving problems that need to be handled by the Coast Guard's top management. According to the Coast Guard's Systems Acquisition Manual, the Council shall review a project's documentation, ensure that the project manager is ready for DOT's review, and ensure top management's commitment to the project's acquisition strategy and plans. However, this review did not include a check of the underlying information. As a result, the data problems that eventually surfaced were not revealed by this review.

When a project moves to a review by the Transportation Systems Acquisition Review Council, members presume that the sponsoring agency has presented complete and valid data, according to the Council's Executive Secretary. In reviewing the Deepwater Project, Council members did ask the Coast Guard to clarify its schedule and estimated costs, clarify the mission activities, and identify the remaining service life of assets. However, the level of review did not extend to examining the completeness of the data.

Our review suggests that at one or more points in the process of reviewing a proposal of this size and complexity, additional steps should be taken to help ensure that acquisition requirements are adequately carried out. For example, reviewers of proposals might require that preparers of documents like the DMAR complete checklists or certify that requirements have been met. Alternatively, one or more of these levels of review could

employ a checklist or some other approach to ensure that a certain level of testing and verification is conducted as part of the review. For the DMAR, such steps would likely have identified the absence of a formal analysis for comparing required capabilities with the capabilities of existing assets.

Conclusions

The remaining useful life of the Coast Guard's deepwater aircraft and ships may be much longer than the Coast Guard originally estimated. While this development could be a justification for slowing down the project, it should be weighed against the long lead time needed for a procurement of this magnitude. If the Coast Guard ensures that the contractors that are developing the initial deepwater proposals have current, complete information on the condition and capabilities of the agency's ships and aircraft, potential problems in this area could be minimized and the project could proceed as planned. This information is critical for ensuring that contractors have the opportunity to develop the most cost-effective proposals as possible, as well as ensuring that the Coast Guard is able to make the best use of existing, upgradable ships and aircraft.

The development of the initial justification for the Deepwater Project was the most complex mission analysis the Coast Guard has ever undertaken, according to Coast Guard officials. As they continue to refine its acquisition-planning process, the Coast Guard and DOT can also apply the lessons learned to future acquisitions as well. In particular, the agencies can look to (1) strengthening the guidance for determining how to establish the remaining useful life of assets, (2) providing better data and documentation on how information supporting an acquisition was developed, and (3) ensuring that reviews of proposals include checks that will help ensure the completeness and accuracy of the information behind a proposal.

Recommendations

We recommend that the Secretary of Transportation direct the Office of the Assistant Secretary for Administration and the Coast Guard to expedite the development and issuance of updated information from internal studies to contractors involved in developing proposals for the Deepwater Project. Information should include, but not necessarily be limited to, the remaining service life of ships and aircraft, gaps between current and needed capabilities, and future service levels.

We recommend that the Secretary of Transportation direct the Office of the the Assistant Secretary for Administration and the Coast Guard to carry out the following additional actions:

- Revise acquisition guidelines to better ensure that mission analysis projects for future projects are based on accurate and complete data on the condition of current assets, as appropriate for the assets or systems in question. Such revisions should stress the importance of using rigorous engineering or other data-based evaluations to estimate the remaining service life of assets rather than using estimates made when the assets were produced or modified.
- Revise acquisition guidelines to ensure that mission analysis reports and mission needs statements disclose the methodologies and data sources used. Also, expand the guidelines and emphasize the importance of using more systematic data collection techniques, such as structured interviews, sampling techniques, and empirical data.
- Develop a method to better ensure that existing acquisition requirements are carried out, such as documenting the gap between current and needed capabilities. Such actions could include the use of tools like checklists of key requirements or certification that requirements have been met.

Estimated Funding Level for the Deepwater Project May Not Be Attainable in the Current Budget Environment

The Coast Guard has told contractors developing proposals for the Deepwater Project to develop their plans on the assumption that the project will cost \$9.8 billion over 20 years—\$300 million starting in fiscal year 2001 and \$500 million per year thereafter. At this size, the budget would take virtually all of the Coast Guard's projected spending for its capital projects, thus leaving little room for ongoing and future projects that amount to at least \$300 million a year. Unless the Congress grants additional funds, which, under existing budget laws could mean reducing funding for some other agency or program, these other capital projects could be severely affected. Furthermore, the Coast Guard proposes that about one-third of the project's funding come from proposed user fees for navigational and domestic ice-breaking services. Such fees have proven controversial when proposed in the past, and the Subcommittees of the Senate and House Committees on Appropriations with jurisdiction over the Coast Guard's budget have already expressed their opposition to such fees. Absent such fees, the money would most likely need to come from additional appropriations. This would place the Deepwater Project in competition with other budget priorities, both inside and outside the Coast Guard.

If budget realities force a readjustment in the Coast Guard's acquisition plans for the Deepwater Project, the agency will likely face one of two choices: reducing the project's scope or buying the same amount but over a longer period of time. Department of Defense (DOD) agencies seeking to procure several such items at once under restricted budgets have often tried to deal with the situation through the latter approach. However, this approach ultimately drives up costs because of such factors as higher administrative costs and the loss of quantity discounts. Now that the Coast Guard has found that many of its ships and aircraft will have a longer useful life than originally thought when the Deepwater Project was proposed, it can reassess the project's strategy and scope and avoid this problem.

Coast Guard's Capital-Spending Target Is Expected to Grow

Funding for the Coast Guard's capital needs is affected by efforts to balance the federal budget. These efforts have resulted in limits on discretionary spending¹ through fiscal year 2002.² These limits are translated into budget targets developed by OMB for individual agencies. The budget targets set by OMB are then subject to change as the President and the Congress consider trade-offs involved in changing the distribution of available funds among programs and agencies.

Overall, OMB's budget targets call for an increase in the Coast Guard's Acquisition, Construction, and Improvements account—the account used to fund the agency's capital projects—over the next 5 years, from about \$398 million in fiscal year 1998 to about \$518 million in fiscal 2003. The higher target presumes that \$165 million in new user fees will be available.

Estimated Cost of Deepwater Project Leaves Little Room for Other Capital Projects

The estimated cost for the Deepwater Project that the Coast Guard put forth in its initial spending plan would soon take up nearly the entire AC&I budget target established by OMB. By fiscal year 2002, when capital spending for the Deepwater Project is anticipated to reach \$500 million, the Deepwater Project will have consumed 97 percent of the projected AC&I account. If the Coast Guard receives the target levels set by OMB, they will leave little room for the Coast Guard's other ongoing capital expenditures. The Coast Guard's capital plan shows that at least \$300 million a year in other capital needs is scheduled from fiscal year 1999 through fiscal 2003.³ Many of these projects, such as the buoy tender projects and shore infrastructure improvements, are ongoing projects that have been in progress for years.

¹Discretionary spending refers to outlays controllable through the congressional appropriation process. In contrast, mandatory spending, which includes outlays for such entitlement programs as food stamps, Medicare, and veterans' pensions, is controlled by the Congress indirectly by its defining of eligibility and setting the benefits or payment rules rather than directly going through the appropriation process.

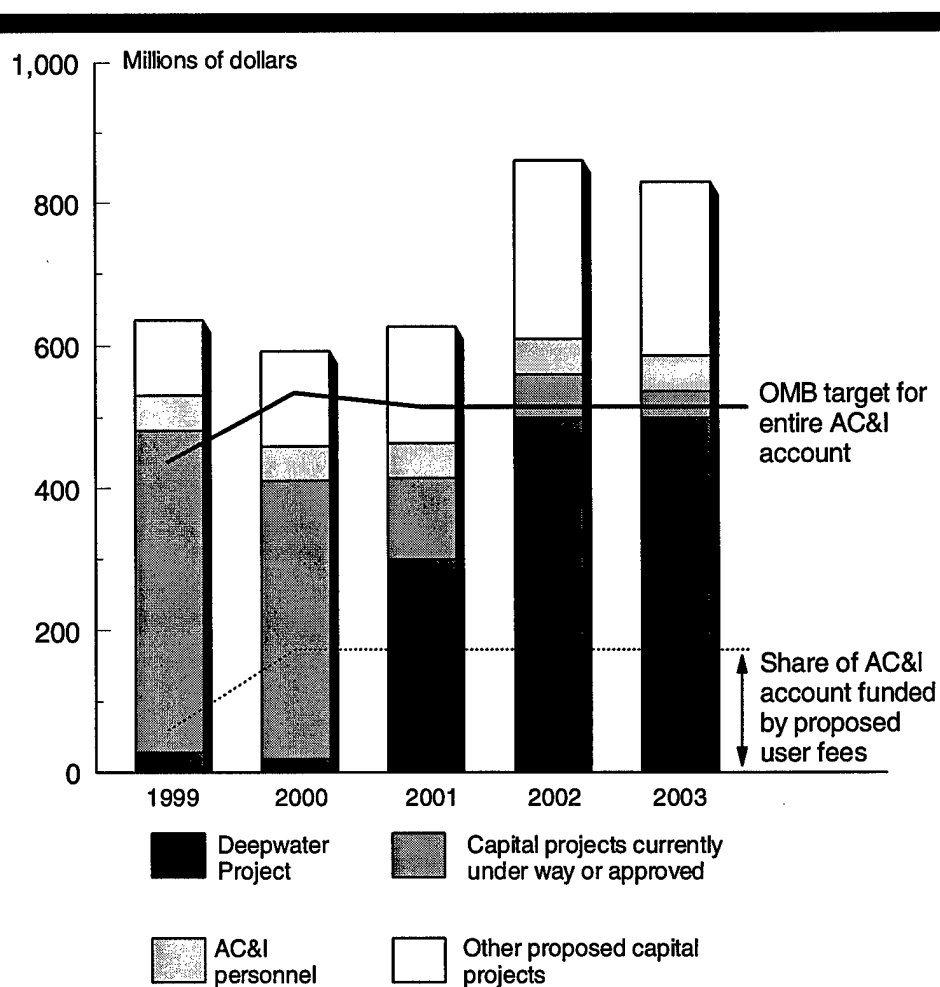
²Accompanying the effort to balance the budget are statutory limits on total discretionary spending that have been in effect since fiscal year 1991. The Balanced Budget and Emergency Deficit Control Act of 1985 (the "Deficit Control Act"), as amended by the Budget Enforcement Act of 1990, the Omnibus Budget Reconciliation Act of 1993, and the Budget Enforcement Act of 1997, established statutory limits on federal government discretionary spending for fiscal years 1991 through 2002. Under these limits, outlays for discretionary spending will remain almost constant in dollar terms from fiscal year 1998 through fiscal 2002. OMB is the agency that prepares the calculations and estimates used to adjust and enforce these limits.

³To identify and plan for its 15-year capital needs, the Coast Guard develops an Agency Capital Plan (formerly called the Capital Investment Plan). According to the Coast Guard, the plan was based on unconstrained resource needs, did not reflect the austere budget climate in which it was issued, and was not a budget strategy document. Coast Guard officials are developing a new plan that would be more aligned with probable levels of funding. Initially, the Coast Guard planned to issue an interim plan in July 1997. As of July 1998, the agency had not issued its new plan.

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Taken together, all current and projected capital spending would dwarf OMB's target by fiscal year 2002. (See fig. 3.1.) Expenditures for the Deepwater Project alone will have risen to the point where they are nearly as great as OMB's target, while expenditures for projects already approved, other future projects, and AC&I personnel⁴ bring the total to more than \$300 million higher than the OMB target.

Figure 3.1: Comparison of OMB's Budget Target and Actual and Proposed Coast Guard Capital Projects, Fiscal Years 1999-2003



⁴Salaries and other costs for Coast Guard personnel responsible for AC&I projects are counted as part of the AC&I account.

User Fee Proposal Creates Greater Funding Uncertainty

The spending targets set by OMB presume funding from two main sources—annual appropriations from the Congress and new user fees. As proposed, the portion that would come from appropriations would drop from \$407 million in fiscal year 1999 to \$353 million in fiscal 2003.⁵ To augment these funds, the administration is proposing \$165 million per year in new user fees beginning in fiscal year 2000.⁶ The fees are for navigational services (such as vessel traffic services in busy harbor areas or maintaining other aids to navigation) and ice-breaking services in domestic waters. The Coast Guard currently provides these services but does not charge for them.

If past experience is any indication, the new fee will likely create controversy. The administration has proposed such fees before, and they have met with strong opposition. Groups who would have to pay the fees, such as ship and barge companies, have argued that singling out such a function for additional charge is unfair. For example, the administration's proposed fiscal year 1998 budget mentioned the possibility of collecting a fee to recover the Coast Guard's cost of providing ice-breaking services in the Great Lakes and the Northeast. However, in its deliberations on the Coast Guard's budget, the Congress did not endorse this user fee.

Obtaining this additional capital funding through user fees would also require congressional approval of a change with regard to earmarking—that is, allowing an agency to keep at least a portion of the fees collected to pay for providing the service. Currently, the Coast Guard is not allowed to keep fees collected; the revenues are sent to the Department of the Treasury, and the agency is reimbursed for its collection costs only.⁷

In July 1998, in their deliberations on the Coast Guard's fiscal year 1999 budget request, the Subcommittees of the Senate and House Committees on Appropriations with jurisdiction over the Coast Guard's budget cited their opposition to the new user fees proposed by the administration, and in addition, the House and Senate have prohibited the Coast Guard from planning or implementing any new user fees. This restriction will require the Coast Guard to seek out alternative sources of financing. The limits on

⁵Twenty million dollars would come from the Oil Spill Liability Trust Fund.

⁶For fiscal year 1999, the administration is proposing \$35 million in new user fees.

⁷In some circumstances, the Congress has allowed agencies to keep the proceeds from user fees to finance programs. For example, in 1997, the Congress authorized the National Park Service to conduct a demonstration fee program that allows parks and other units to collect new or increased admission and user fees and spend the new revenue for park improvements.

discretionary spending set by the Deficit Control Act, as amended, will make it difficult for the Coast Guard to increase the level of funding for its AC&I account without taking funds away from another agency or budget account. Within the context of this act, as amended, increasing the level of appropriated funding in the future can be done only by reducing the level of another account, since discretionary spending is limited to the same nominal amount from fiscal year 1999 through fiscal 2002. These conditions—the reality of deficit reduction efforts and the uncertainty of a yet to be implemented user fee—point to the potential for a “double squeeze” on the Coast Guard’s AC&I account.

Reassessing the Acquisition and Funding Plan for the Deepwater Project Could Reduce the Risk of Cost Increases Later

Now that the Coast Guard knows that many of its deepwater ships and aircraft will have a longer useful life than originally thought, it may be in a position to reassess whether the funding strategy for the Deepwater Project should be changed. Such a reassessment may be needed to avoid the procurement mistakes often made by federal agencies in the past. If budget realities dictate the procurement of deepwater ships and aircraft at a much lower level than \$500 million a year, this could result in the Coast Guard’s being able to obtain considerably less value for the dollars expended.

Agencies that plan procurements that are too large for available funding budgets are left with essentially two choices: they can reduce the scope of the project at that point or they can adjust by using schedule stretch-outs—that is, buying smaller quantities of each item and lengthening the period over which the assets are acquired. Our work on DOD’s acquisition projects shows that costs can expand dramatically when this latter approach is adopted as a solution to acquisition plans that are not closely aligned with probable funding levels. For example, in a study of DOD’s acquisition strategy, we found that an attempt to purchase too many weapon systems at once had the effect of driving up costs, even when the weapons being produced were proven systems that were beyond the testing stage. When DOD was faced with funding limitations and had to stretch out the procurement period for 17 such weapons systems, the systems had cost increases totaling \$10 billion.⁸

The Coast Guard has already used schedule stretch-outs as a way to deal with tight budgets—and with the same consequences. For example, the Coast Guard stretched procurement of 11 seagoing buoy tenders to 5 years

⁸The \$10 billion estimate is in 1996 dollars. See Weapons Acquisition: Better Use of Limited DOD Acquisition Funding Would Reduce Costs (GAO/NSIAD-97-23, Feb. 23, 1997).

instead of the planned 3-year period. Because of the loss of quantity discounts and higher administrative costs, the acquisition cost increased by an estimated \$20 million to \$30 million, according to the Coast Guard.

As the Coast Guard proceeds with the project, the better-than-anticipated life of current deepwater ships and aircraft may provide the agency with an opportunity to adopt a more effective approach. It is now clear that many deepwater assets—especially aircraft—can operate many years beyond earlier estimates, assuming they receive the proper maintenance and upgrades. If many of these ships and aircraft can be upgraded and used for a much longer period of time, replacement needs—particularly in the short term—could be considerably less than the \$500 million a year the Coast Guard has asked contractors to design their proposals around. Instead of being in a situation that commits the Coast Guard to replacing several kinds of deepwater ships and aircraft at once, the improved outlook would appear to allow the Coast Guard to focus on acquiring those ships and aircraft clearly in need of immediate recapitalization. This, in turn, would allow the Coast Guard to focus more dollars on completing other nondeepwater acquisition projects in the near term, thereby avoiding the waste that can occur under stretched-out schedules.

Coast Guard managers pointed out that their planning approach to the Deepwater Project permits adjustments to the acquisition strategy and projected funding stream if projected levels of funding are not appropriated. Agency managers indicated that decisions on the schedule and options for procurement—ranging from the replacement of the entire system to the renovation and modernization of the existing system—will be made as the Coast Guard proceeds with the project. According to agency managers, proceeding to the next phase of the acquisition—demonstration and validation—will be contingent on the availability of funds. In the likelihood that \$500 million a year is not received, they said, the agency will make adjustments and call on its contractors to revise their proposals and plans.

We acknowledge that the Coast Guard has the flexibility to adjust the project later, but we question the advisability of continuing to ask contractors to develop a proposal so expensive that its funding appears doubtful. Our concern is that the planning assumption on which the Deepwater Project's development is currently being based (a funding stream of \$500 million a year) make the options for later adjustments expensive. If proposals must be extensively redone to make them less expensive, the government will have spent time and money in funding

work that may be of limited value, and if the decision is made to adopt an expensive proposal but stretch out the procurement period to make it affordable, the Coast Guard could repeat the money-wasting scenario we have identified in so many other DOD scenarios. By contrast, using a strategy that is based on probable funding levels would appear to leave the Coast Guard in a better position to continue with the rest of the acquisition process.

Conclusions

In a global sense, the Coast Guard is correct in beginning now to explore future systems to modernize deepwater ships and aircraft, especially given the long lead times often associated with procurements of this magnitude. The agency's "system of systems" approach seems logical as a way to avoid a costly one-for-one replacement of assets, and its use of multiple contractors is an attempt to leverage technology and to identify cost-effective alternatives. However, despite these efforts, the proposed cost of the Deepwater Project threatens to overwhelm the Coast Guard's AC&I account, which already rests on an uncertain premise that new user fees will be approved. By directing contractor teams to base their proposals on a funding amount nearly equal to its entire projected budget for its AC&I account, the Coast Guard is at risk of receiving Deepwater Project proposals that either (1) must be redone once funding levels become known or (2) result in expensive, stretched-out procurements.

Contractors have just begun work on developing their proposals for the Deepwater Project. To align these proposals more realistically with the agency's budget constraints and other capital needs, the Coast Guard would need to move as quickly as possible in changing the funding assumptions on which the project is based.

Recommendations

We recommend that the Secretary of Transportation direct the Commandant of the Coast Guard to evaluate whether contracting teams should be instructed to base their proposals for the Deepwater Project on the assumption that the funding level will be lower than \$500 million a year. We also recommend that the Commandant be directed to submit his decision on this matter to DOT's Transportation System Acquisition Review Council and/or other appropriate offices within DOT for approval.

Agency Comments

We provided DOT and the Coast Guard with a draft of this report for review and comment. DOT and the Coast Guard generally concurred with the

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information in the report, and DOT indicated that they would consider the report's recommendations. The Coast Guard generally concurred with the recommendations and said it will strive to improve the acquisition process. In addition, DOT and the Coast Guard provided several comments that clarified information on the DOT acquisition process, the cost of operating deepwater ships and aircraft, and the goals of the Deepwater Project, which we have incorporated into the report as appropriate.

Primary Uses of Deepwater Ships and Aircraft, Fiscal Year 1997

Type of asset	Mission area						
	Drug control	Fisheries	Migrants	Search and rescue	Training and public affairs	Military operations	Others
Ships							
378-foot high- endurance cutter	28.2%	36.6%	1.4%	3.2%	14.8%	7.3%	8.5%
270-foot medium- endurance cutter	44.2	13.8	15.1	1.3	10.4	2.1	13.1
210-foot medium- endurance cutter	40.3	18.5	14.1	2.8	11.7	0.6	12.0
110-foot patrol boat	24.0	20.8	10.2	29.2	3.8	0.3	11.6
Aircraft							
HC-130 long-range surveillance airplane	18.9	25.6	10.1	15.4	17.8	0.1	12.1
HU-25 medium-range surveillance airplane	26.1	20.7	8.0	13.1	22.0	0	10.1
HH-60 medium-range recovery helicopter	17.2	8.3	1.6	17.7	38.7	0.4	16.1
HH-65A short-range recovery helicopter	11.7	8.7	3.4	18.9	37.1	0.6	19.6

Source: GAO's analysis of the Coast Guard's data.

Operational Costs for Deepwater Ships and Aircraft, Fiscal Year 1997

Type of asset	Direct expenditures	Direct support expenditures	Overhead
Ships			
378-foot high- endurance cutter	\$101,184,769	\$68,525,669	\$38,499,933
270-foot medium- endurance cutter	72,227,363	47,618,453	26,753,584
210-foot medium- endurance cutter	63,451,659	44,332,894	24,907,650
110-foot patrol boat	53,650,282	30,850,002	17,332,526
Aircraft			
HC-130 long-range surveillance airplane	115,198,845	23,660,979	23,305,044
HU-25 medium-range surveillance airplane	70,859,905	9,674,890	9,529,350
HH-60 medium-range recovery helicopter	112,287,297	26,676,029	26,274,738
HH-65 short-range recovery helicopter	173,186,660	36,086,986	35,544,125

Source: The Coast Guard's Cost Accounting Model.

Upgrades to the Coast Guard's Aircraft

The Coast Guard has identified several projects that can further the life or upgrade the capability of its aircraft. These projects are funded from acquisition, construction, and improvement appropriations.

**Appendix III
Upgrades to the Coast Guard's Aircraft**

Table III.1: Projects That Can Prolong the Life of the Coast Guard's Aircraft

Dollars in millions

Aircraft	Project's title	Project's description	Project's cost	Project's status
HC-130	T-56 Engine Conversion	The engine upgrade will decrease operating and support costs and increase safety for flight crews.	\$20.8	Started in FY1997
HC-130	Side Looking Airborne Radar	The project will standardize the Coast Guard's SLAR-equipped aircraft by upgrading the SLAR to the HU-25 Aireye standard. This project will replace outdated and obsolete sensor systems.	13.1	Started in FY1993
HC-130	Aircraft Sensor Upgrade	The project provides increased sensor efficiencies via 12 systems capable of being rapidly interchanged between aircraft. It will provide the capability for more effective 24-hour operations and provide surface- or land-based assets with long-range real-time information.	16.3	Started in FY1998
HC-130	Long Range Search Capability Preservation	The upgrade will replace antiquated electrical and avionics systems and install standard fleet components.	40-96	Started in FY1998
HU-25	Avionics Improvements	The project will replace obsolete 1970s-vintage avionics.	11.6	To start in FY1999
HU-25	Reengining of aircraft	Project will replace engines.	To be determined	Start date undetermined
HH-60J	Independent Navigation	The project will replace the current unreliable system with a new system necessary for safe successful single-aircraft operations.	6	To start in FY1999
HH-60J	Service Life extension	The project would replace entire transmission upper deck, vibrator absorber system, and reinforce tail pylon.	To be determined	Start date undetermined
HH-65A	Kapton Rewiring	The project rewires the helicopter. This will correct a serious flight safety hazard posed by the existing Kapton wiring.	12.7	Started in FY1997
HH-65A	Mission Computer Unit	The project replaces obsolete mission computers with smaller, lighter, more reliable, and supportable equipment.	20.4	Started in FY1997
HH-65A	LTS-101 engine life cycle cost reduction	The project would replace the engine control system with a Full Authority Digital Electronic Control, which will minimize safety risks and increase engine performance.	17.4	Start date undetermined
All aircraft	Aviation Logistics Management Information System	This source and data entry project will provide a framework to streamline the data entry process while facilitating access to management-level information for aviation logistics.	12.3	Started in FY1997
All aircraft	Commercial SATCOM	The project will provide secure and reliable communications for command and control through commercial satellite communications.	21.5	To start in FY1999

Legend

FY = fiscal year

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