

May 2001

# COAST GUARD

## Progress Being Made on Deepwater Project, but Risks Remain



GAO

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# Contents

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<b>Letter</b>		1
<b>Appendix I</b>	<b>Objectives, Scope, and Methodology</b>	36
<b>Appendix II</b>	<b>Current Deepwater Cutters and Aircraft</b>	39
<b>Appendix III</b>	<b>Estimated Service Life of the Coast Guard's Deepwater Cutters and Aircraft</b>	40
<b>Appendix IV</b>	<b>List of the Members of Each Contracting Team</b>	42
<b>Appendix V</b>	<b>Comments From the Department of Transportation</b>	44
<b>Appendix VI</b>	<b>GAO Contacts and Staff Acknowledgements</b>	51
<hr/>		
<b>Tables</b>		
	Table 1: Areas of Risk and Overall Risk Levels for the Deepwater Project	5
	Table 2: Office of Management Budget Targets for Coast Guard Capital Budget, Fiscal Years 2002-2006	11
	Table 3: Estimated Service Life of Deepwater Assets	40
<hr/>		
<b>Figures</b>		
	Figure 1: Comparison of Expenditure Estimates for Deepwater Project, Fiscal Years 2002-2006	12

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## **Abbreviations**

DOD	Department of Defense
DOT	Department of Transportation
FAA	Federal Aviation Administration
IAGC	Independent Analysis Government Contractor
NASA	National Aeronautical and Space Administration
OMB	Office of Management and Budget
RFP	request for proposals
TRL	technical readiness levels



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United States General Accounting Office  
Washington, DC 20548

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May 2, 2001

The Honorable Frank A. LoBiondo  
Chairman  
The Honorable Corrine Brown  
Ranking Minority Member  
Subcommittee on Coast Guard and  
Maritime Transportation  
Committee on Transportation and  
Infrastructure  
House of Representatives

The Honorable Wayne T. Gilchrest  
The Honorable Bob Clement  
House of Representatives

The Coast Guard is in the final stages of planning the largest procurement project in its history—the modernization and/or replacement of over 90 cutters and 200 aircraft used for missions beyond 50 miles from shore.<sup>1</sup> This project, called the Deepwater Capability Replacement Project, is expected to cost over \$10 billion (in 1998 dollars) and take 20 or more years to complete. Through fiscal year 2001, the Congress has appropriated \$116 million to design the project.<sup>2</sup> The Coast Guard is currently finalizing its acquisition plan and contracting approach and forming its organization to oversee the project. During the latter part of 2001, the Coast Guard will be evaluating proposals now being developed by three contracting teams competing for a contract to build the deepwater system. The Coast Guard plans to award a contract to one of these teams early in 2002.

Given the size and scope of the project and its importance to the Coast Guard, you asked us to monitor the project closely and provide information for the Congress, as it considers funding for this project. As agreed with your office, this report focuses on the major risks facing the

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<sup>1</sup>Deepwater missions require extended on-scene presence of at least 45 days, long transit distance to reach the operating area, or forward deployment of forces.

<sup>2</sup>Of the \$116 million, contractors developing proposals for the system received \$61 million, and the Coast Guard received \$55 million.

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Coast Guard on this project and the progress the agency has made in addressing them.

Our assessments of risk are based primarily on federal acquisition criteria, such as the Federal Acquisition Regulation and the Office of Management and Budget's (OMB) Circular No. A-11 on Capital Programming; discussions with officials of the Office of Federal Procurement Policy; interviews with procurement experts; the experience gleaned from conducting a substantial body of work performed on other acquisitions, especially those of the Department of Defense (DOD), information technology projects across government, and OMB and our reports on best practices in capital decisionmaking and management of major acquisitions. Our assessments of the progress the Coast Guard has made in addressing these risks are based on reviews of many Coast Guard documents pertaining to the Deepwater Project and capital planning in general, as well as numerous detailed discussions with Coast Guard staff. Throughout this process, we brought our concerns to the Coast Guard's attention as soon as possible to increase the opportunity for useful exchange of information and, where necessary, timely corrective action. We conducted our work from April 2000 through April 2001 in accordance with generally accepted government auditing standards. Additional information on our scope and methodology appears in appendix I.

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## Results In Brief

The Congress and the Coast Guard are at a major crossroads with the Deepwater Project, in that planning for the project is essentially complete, and the Congress will soon be asked to commit to a multibillion dollar project that will define the way the Coast Guard performs many of its missions for decades to come. The deepwater acquisition strategy is unique and untried for a project of this magnitude, and it carries many risks which could potentially cause significant schedule delays and cost increases. The Deepwater Project faces risks in four key areas: (1) planning the project around annual funding levels far above what the administration has told the Coast Guard it can expect to receive; (2) keeping costs under control in the contract's later years; (3) ensuring that procedures and personnel are in place for managing and overseeing the contractor, once the contract is awarded; and (4) minimizing potential problems with developing unproven technology. All of these risks can be mitigated to varying degrees, but not without management attention.

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## Dependence on Sustained High Funding Levels

Affordability is the biggest risk for the Deepwater Project. The Coast Guard has chosen a contract approach that depends on a sustained funding level of about \$500 million a year (in 1998 dollars) for the next 2 to 3 decades. However, according to budget projections from OMB, the Coast Guard faces the real possibility of a cumulative funding shortfall of almost half a billion dollars for the project's first 5 years. Also, the Coast Guard plans to request additional funds at a time when the administration plans to continue budget constraints on federal spending and when other Department of Transportation (DOT) agencies, such as the Federal Aviation Administration (FAA), are also undertaking major capital projects. The Coast Guard acknowledges that the potential funding risks are high but believes it should keep its current approach of developing the project around the planned funding stream. However, the potential risks are substantial, and another strategy appears warranted—one that involves a lower funding scenario around which contractors can develop their proposals. Proceeding with the project on the basis of unrealistic funding expectations may result in unwanted consequences. If funding does not materialize as planned after the contract award, the Coast Guard may have to alter the systems integrator's schedule for producing and delivering agreed to quantities and types of deepwater assets. Altering the schedule would require renegotiating prices in a sole-source environment and negotiating new cost and performance guidelines. This would be costly for the Coast Guard and would set off ripples affecting the acquisition of deepwater equipment for years to come.

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## Controlling Costs After the First Few Years

The Coast Guard has selected a novel contracting approach—one never tried on a contract this large. It calls for procuring ships, aircraft, and equipment through a single, prime contractor over 2 or more decades. Because each of the three contractors now competing for the contract is developing its proposal in conjunction with its own team of companies, it is likely that the companies in each team will supply most of this equipment. This approach allows the winning contractor to focus on integrating all of the Coast Guard's deepwater ships and aircraft, and the competition between teams tends to control costs in the project's early years. However, the benefits of this competition will diminish after the first few years of the project because of the Coast Guard's likely reliance on a single contracting team. We and others have raised concerns whether the Coast Guard's planned contracting approach will be able to control costs and still meet performance requirements once the contract is awarded in 2002, particularly since it was adopted without documentation that an in-depth analysis of alternative contract approaches was done. The

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Coast Guard has taken steps to consider this feedback, but it is still evaluating what steps to take in response.

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### Managing and Overseeing the Acquisition Phase of the Project

So far, the Deepwater Project has been in the planning phase. In most respects, the Coast Guard's management of this phase has been excellent. In fact, the Coast Guard's procedures and management structure for this phase were among the best of the federal agencies we have evaluated. The Coast Guard took many innovative steps, such as developing and using performance specifications to encourage the contractors to develop innovative designs, using state-of-the-art technology, and involving "matrix" teams in which Coast Guard personnel representing different program areas have been fully involved with each team of contractors. While its management, during the planning phase, provides a solid foundation for the project, the next phase presents considerably tougher challenges. The challenges include recruiting and training enough staff to manage and oversee the contract, determining how the oversight effort will be structured, determining how to manage its relationship with subcontractors as well as the prime contractor, ensuring useful segments of the project are fully funded in advance of buying equipment, measuring the effects on operations and total system costs as new equipment replaces existing ships and aircraft, and developing contingency plans in case problems develop with the performance of the prime contractor or subcontractors.

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### Minimizing Problems With Unproven Technology

Our reviews of other acquisitions show that reliance on unproven technology is a frequent contributor to escalated costs, schedule delays, and compromised performance standards. As with contract oversight, the Coast Guard's initial steps in countering this risk have been very good. The Coast Guard has told contractors to emphasize "off-the-shelf" technology (i.e., technology that is commercially available and already in similar use). Our review of 18 key technologies that contractors are proposing to use in the first 7 years of the project showed that almost all should be sufficiently mature by the time the contract is awarded. However, there is less certainty about technology in later years. The Coast Guard needs a structured process for assessing and monitoring this risk. So far, it has none.

Our overall assessment of the risk levels in the four areas is shown in table 1. We are making recommendations to help the Coast Guard improve the long-term success of the Deepwater Project, including one for DOT to have contractors now competing for the deepwater contract to develop their final proposals around a funding stream consistent with OMB budget

targets. In commenting on a draft of this report, DOT disagreed with this recommendation, noting that out-year budget targets for the Coast Guard's capital projects have increased and will continue to increase to accommodate deepwater funding needs. We believe that DOT's position on this matter leaves the Deepwater Project vulnerable to cost increases and schedule slippages and could jeopardize the Coast Guard's ability to achieve its missions effectively if funding shortfalls occur. We are also raising an issue for congressional consideration that could help the Congress in making funding decisions on the project.

**Table 1: Areas of Risk and Overall Risk Levels for the Deepwater Project**

Area of risk	Risk level	Reasons for assigning this level of risk
Attaining a stable, sustained funding level	High	Several years of funding substantially below planned funding levels can have adverse consequences for the acquisition strategy. Budget constraints and other budget priorities threaten the Coast Guard's ability to achieve large, sustained increases in its budget for capital spending.
Controlling costs in the contract's later years	Moderate to High	The risks center on the potential lack of future competition and reliance on a single contractor to procure the entire system. The level of risk depends on the effectiveness of provisions the Coast Guard designs and includes in the contract to encourage or require subcontract competition and increase its leverage in negotiating future contracts with the prime contractor.
Overseeing the acquisition	Moderate	Although there are many uncertainties about contract management as the Coast Guard increases the size of the administrative effort, the commendable start and the ability to make specific changes lessen the degree of risk in this area.
Using unproven technology	Low to moderate	The steps needed to mitigate this risk are relatively few and straightforward. The lack of an assessment tool to measure technology maturity poses a short-term (low) and long-term (moderate) risk.

Source: GAO analysis of risk areas.

## Background

Cutters, patrol boats, airplanes, and helicopters are all critical to meeting the Coast Guard's deepwater missions that are beyond the range of shore-based small boats.<sup>3</sup> These missions include actions such as enforcing fisheries laws, intercepting drug smugglers and illegal immigrants, and conducting search and rescue missions far out at sea.

<sup>3</sup>See app. II for a list of the various classes of the 93 ships and 206 aircraft currently assigned to deepwater missions.



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## Why Does the Coast Guard Need to Replace or Modernize Deepwater Ships and Aircraft?

Many of the Coast Guard's current cutters were built in the 1960s, and many of the aircraft in the 1970s and 1980s. Although these ships and aircraft have been upgraded in a number of ways since being acquired, the Coast Guard has documented a number of performance and support problems, such as the following:

- poor sensors and night operations capability on both aircraft and cutters,
- limited ability of cutters and aircraft to operate effectively together,
- inadequate communications, and
- high operating and maintenance costs.

In a November 1995 mission analysis report, the Coast Guard cited its rapidly aging deepwater fleet as a justification to begin a project for acquiring new ships and aircraft. In 1998, we reported that the service life of the Coast Guard's deepwater ships and aircraft might be much longer than the Coast Guard originally estimated in its 1995 analysis.<sup>4</sup> We recommended that the Coast Guard develop additional information on the remaining service life of ships and aircraft. In 1998, the Coast Guard determined that the service life of the various aircraft classes could be extended by about 11 to 28 years over original estimates, assuming that increased maintenance and upgrades occur. In addition, by January 2001, the Coast Guard had issued an updated analysis that extended the service life of two of the four ship classes by an additional 5 years, assuming that increased maintenance and upgrades occur.<sup>5</sup> The Coast Guard provided this information to its contractors so that they could use it in developing their proposals.

In December 1999, an interagency task force on the roles and missions of the Coast Guard reported that recapitalization of the Coast Guard's deepwater capability is a near-term national priority and endorsed the Deepwater Project's process and timeline.<sup>6</sup> Although our earlier work took issue with the Coast Guard's initial analysis of how soon its deepwater assets would need to be replaced, we do not now take issue with the Coast

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<sup>4</sup> *Coast Guard's Acquisition Management: Deepwater Project's Justification and Affordability Need to Be Addressed More Thoroughly* (GAO/RCED-99-6, Oct. 26, 1998).

<sup>5</sup> See app. III for the current estimated service life of existing deepwater cutters and aircraft.

<sup>6</sup> Interagency Task Force on Coast Guard Roles and Missions, *A Coast Guard for the Twenty First Century*, Dec. 3, 1999.

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Guard's position that it needs to modernize these assets, especially due to the additional studies completed since our 1998 report. Our congressional directive in this report has been to examine the acquisition approach.

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## The Acquisition Approach for the Deepwater Project

The acquisition approach for the Deepwater Project is innovative. Rather than using the traditional approach of replacing an individual class of ships or aircraft, the Coast Guard has adopted a "system-of-systems" approach intended to integrate ships, aircraft, sensors, and communication links together as a system to accomplish mission objectives more effectively. The Coast Guard expects this approach will both improve the effectiveness of deepwater operations and reduce operating costs.

The project has two basic phases—a design phase (called "concept exploration" and known as phase 1) and a final proposal preparation and procurement phase (called "demonstration and validation/full-scale development" and known as phase 2). Phase 1 began in March 1998. As part of this phase, the Coast Guard contracted with three competing teams of contractors to conceive and begin designing a proposed deepwater system.<sup>7</sup> Each proposal is to be based on meeting a set of performance specifications developed by the Coast Guard. Each team was instructed to develop its proposal on a funding stream of \$300 million for the first year and \$500 million annually until the project is completed. These amounts are in constant 1998 dollars; actual funding would be higher to account for inflation. Phase 1 ends with each team's development of a proposed deepwater concept, the functional design for which will be 80-percent complete.

In phase 2, which begins in June 2001, the Coast Guard plans to issue a request for proposals (RFP) to the three industry teams to develop final proposals. The current schedule calls for these proposals to be completed and submitted to the Coast Guard during the last quarter of fiscal year 2001. The Coast Guard will evaluate which proposal provides best value for the government as gauged mainly by a combination of improvements in

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<sup>7</sup>See app. IV for a complete list of participants from each contracting team.

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operational effectiveness<sup>8</sup> and minimizing total ownership costs.<sup>9</sup> Other evaluation factors include the technical feasibility of the proposed design and the management capability of the systems integrator.

When the deepwater contract is awarded early in 2002, the contract will actually be between the Coast Guard and the prime contractor, known as the “systems integrator,” of the winning contracting team. This systems integrator will be responsible for ensuring that each ship, aircraft, or other equipment is delivered on time and in accordance with agreed to prices. The systems integrator will also be called on to deliver the complete deepwater system in compliance with the Coast Guard’s system performance specifications. The Coast Guard adopted this approach because it does not believe it has the technical expertise or the resources to be a systems integrator. Also, the Coast Guard believes that a team of contractors led by a systems integrator would provide the best method of acquiring a set of ships, aircraft, and other equipment and would optimize improvements in operational effectiveness and total ownership costs. This contracting approach could thus result in a long-term contractual arrangement with a single contractor and its team of subcontractors.

The Coast Guard plans to have an initial 5-year contract with the systems integrator. The systems integrator would receive a base award for management and system integration services. Assuming the project proceeds as planned, task and delivery orders for deepwater equipment would be issued by the Coast Guard in accordance with the systems integrator’s implementation schedule.<sup>10</sup> If the performance of the systems integrator is satisfactory for each award-term contract, the Coast Guard plans to award follow-on, award-term contracts (as many as five for successive 5-year, award-term contracts) with the same systems integrator. The Coast Guard plans to negotiate prices with the systems integrator on the follow-on contracts.

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<sup>8</sup>Operational effectiveness involves the Coast Guard’s ability to carry out its deepwater missions. For example, it includes the number of lives saved, the amount of drugs interdicted, and the number of immigrants interdicted.

<sup>9</sup>Total ownership costs include acquisition, operating, maintenance, and support costs for the deepwater system over a 40-year period.

<sup>10</sup> The Coast Guard will have some flexibility to delay issuing task and delivery orders based on funding or other considerations. However, major deviations from the minimum scheduled orders, as laid out in the systems integrator’s implementation plan, will require rebaselining performance targets and prices in a sole-source environment.

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## Viability of Contracting Approach Depends on a Sustained High Level of Funding

The Congress is at a critical juncture with the Deepwater Project because the success of the contracting approach rests heavily on the Coast Guard being able to count on sustained funding of about \$500 million (in 1998 dollars) for 20 years or more. The contracting approach the Coast Guard has selected is not easily adaptable to lower levels of funding without stretching the schedule and increasing costs. However, there are signs that funding levels may be lower than the planned amount. Although the administration's budget request for the Deepwater Project for fiscal year 2002 will be about 10 percent less than the project's planned first-year funding, the average shortfall for fiscal years 2003 to 2006 is about 20 percent.<sup>11</sup> Moreover, much of the funding for fiscal year 2002 is from the Western Hemisphere Drug Elimination Act (P.L. 105-277), a source that will not be available after this year unless the act is extended.

Capital funding for the Coast Guard is in competition with many other potential uses of federal funds within the Coast Guard itself, DOT as a whole, and other federal agencies. To accommodate the Deepwater Project, the Coast Guard is proposing to limit spending on its other ongoing capital projects to levels far below where they have been in decades. Given these various budgetary pressures, it appears advisable to have contractors develop their plans around a lesser amount. The Coast Guard's approach, however, is inextricably tied to the more optimistic option. In using a lower, more realistic funding level aligned with OMB budget projections, the Coast Guard could lessen the risk of future cost increases, schedule stretch-outs, and low system performance levels.

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## Success of Contracting Approach Relies on Sustained High Funding

The contract approach that the Coast Guard has decided to use for the Deepwater Project depends on a large, sustained, and stable funding stream over the next 2 to 3 decades. The approach is based on acquiring ships and aircraft on the contractor's proposed schedule so that they will form a "system of systems." Substantial funding shortfalls cannot only affect the ships and aircraft scheduled for acquisition in the short term; but, they can also set off ripples affecting the acquisition of deepwater equipment for years to come. Adjustments that may be needed include

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<sup>11</sup>Until this point, the figures presented for the Deepwater Project have been in constant 1998 dollars, the approach used in Deepwater Project planning documents. However, the funding amounts that OMB has assigned to the Coast Guard are in actual "year-of-expenditure dollars," with amounts for future years adjusted for inflation. To conform this discussion to the OMB numbers, the amounts in this discussion are presented in current-year dollars.

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revising the implementation plan for delivering equipment, renegotiating prices for deepwater equipment, and negotiating new cost and performance baselines with the systems integrator. Such adjustments would not only be costly; but, they could also slow the schedule to the point that (1) total ownership costs would rise and (2) advantages projected in the contractor's proposal, such as improvements in operational effectiveness, would not materialize. At the extreme, funding shortfalls would affect the Coast Guard's ability to proceed with the contract as well as the agency's ability to perform its deepwater missions.

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### Administration's Funding Proposals Signal Caution About Whether Projected Funding Will Be Available

The decision on funding the Deepwater Project rests ultimately with the Congress, but because this decision has yet to be made, we used the administration's budget proposal for the Coast Guard (as contained in the budget documents prepared by OMB) as a starting point for analyzing the funding issue. OMB's budget targets for fiscal years 2002 through 2006 do not propose specific amounts for the Deepwater Project; rather, they provide a single amount for all Coast Guard capital projects. As table 1 shows, this overall total ranges from \$659 million (in-year-of expenditure dollars) in fiscal year 2002 to \$719 million in fiscal year 2006. Because the Coast Guard has many other capital projects under way besides the Deepwater Project, it must decide how this money will be allocated among them. After receiving the budget targets from OMB in early March 2001, the Coast Guard estimated that the amount available for the Deepwater Project would range from \$338 million (in year-of-expenditure dollars) in fiscal year 2002 to \$547 million in fiscal year 2006.

**Table 2: OMB Budget Targets for Coast Guard Capital Budget, Fiscal Years 2002-2006**

Amounts in millions

Fiscal year	OMB budget target for Coast Guard's capital projects	Coast Guard's planned distribution of budget target set by OMB	
		To be spent on Deepwater Project	To be spent on other projects
2002	\$659	\$338	\$321
2003	673	396	277
2004	688	442	246
2005	704	508	196
2006	719	547	172

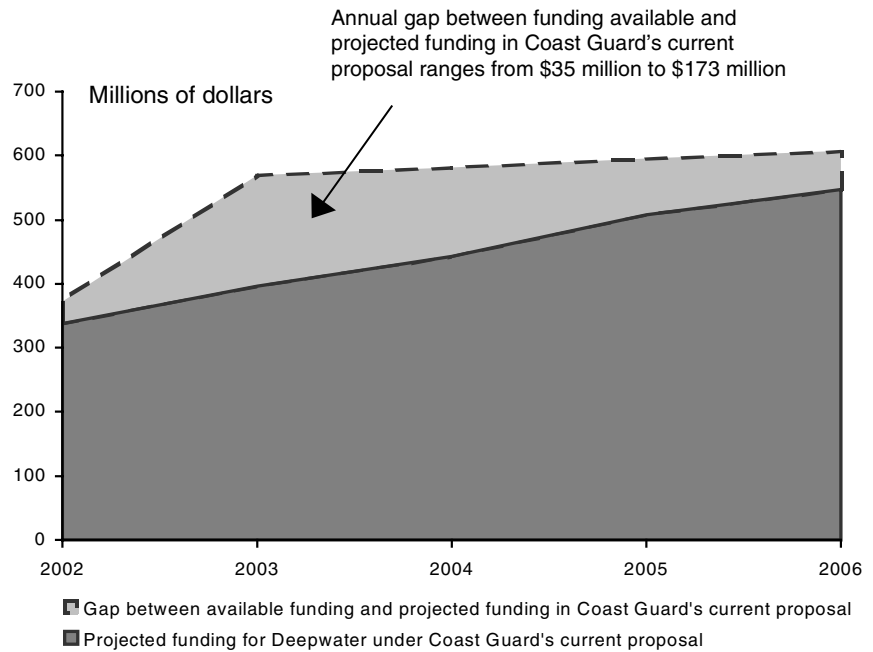
Note: Amounts are in current (year-of-expenditure) dollars.

Source: U.S. Coast Guard 5-year funding projection.

If the Coast Guard proceeds with its current plans in issuing the RFP, contractors will be instructed to develop plans around a much higher funding stream than is available under the OMB budget targets. For example, the funding stream that the Coast Guard currently plans to use for the project (\$350 million the first year and \$525 million in subsequent years) is in 1998 dollars.<sup>12</sup> Adjusted for inflation, this figure becomes \$373 million in fiscal year 2002 (compared with OMB's target of \$338 million) and \$569 million in fiscal year 2003 (compared with the target of \$396 million). By the end of fiscal year 2006, the cumulative gap will total \$496 million. While this shortfall may not seem so significant in the scheme of the overall budget, this amount is significant in the context of DOT's total budget, especially given the competition among DOT agencies for available funding—a point that we discuss in more detail below. Figure 1 shows that the annual gap between planned funding and the amount available under OMB budget targets ranges from \$35 million to \$173 million.

<sup>12</sup> These amounts include \$300 million for the systems integrator and \$50 million for the Coast Guard to oversee the contract in the first year and \$500 million for the systems integrator and \$25 million for the Coast Guard in subsequent years.

**Figure 1: Comparison of Expenditure Estimates for Deepwater Project, Fiscal Years 2002-2006**



Note: Amounts are in current (year-of-expenditure) dollars.

Source: U.S. Coast Guard's 5-year funding projection and GAO analysis of deepwater funding levels in year-of-expenditure dollars.

Although the Coast Guard may be able to begin the project as planned at the level of funding provided for fiscal year 2002, the success of this first year may provide a false sense of security about how easy it will be to sustain projected funding levels. In fiscal year 2002, spending is relatively low compared with later years. Coast Guard officials said they plan to fully fund the contractor's share of the planned amount and trim their own administrative expenses related to the project. In subsequent years, when planned payments to contractors rise much more steeply than amounts available, the gap may be far less manageable.<sup>13</sup> In addition, the project's first-year funding comes mainly from a source that will be soon exhausted. About \$243 million of the amount proposed for the Deepwater Project in

<sup>13</sup>These amounts do not include any costs for engineering change proposals or incentive payments for the systems integrator.

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fiscal year 2002 would come from funds authorized in the 1998 Western Hemisphere Drug Elimination Act (P.L. 105-277), which will expire this year unless it is extended. OMB officials told us that it plans to request additional appropriations under this act in fiscal years 2003 to 2006.

Another concern is the potential effect of the Deepwater Project on other Coast Guard capital projects planned or under way. These other capital needs include, for example, modernizing communication equipment used to support search and rescue activities, and upgrading various shoreside facilities, such as boat stations and housing. The overall amount the Coast Guard now plans to spend on these projects is substantially less than the agency indicated in plans just a year ago. For example, in 2000, the Coast Guard's planning documents proposed spending \$475 million on nondeepwater projects in 2005. However, under the current plan, that spending level would drop by more than half, to about \$196 million. In part, these proposals reflect the fact that some of the other capital projects, such as the buoy tender project, will be winding down, and the costs of other projects will be absorbed as part of the Deepwater Project. Rather dramatic reductions in other capital projects cannot be explained as easily. For example, estimated spending for improved shore facilities in fiscal year 2005 dropped from \$147 million in last year's plan to \$59 million in the current plan. If estimates in the current plan hold true, fiscal year 2006 spending for nondeepwater projects will be at its lowest level in decades and call into question the validity of the agency's estimates to maintain its current nondeepwater infrastructure. The presence of these other capital needs cannot be forgotten in assessing how ready the Coast Guard is to assume the risks of the Deepwater Project.

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### Future Funding for Deepwater Will Compete With Other Budget Priorities

The fiscal environment in which the Coast Guard must obtain funds for the Deepwater Project and other capital needs is further complicated by competition for funds with other DOT priorities. Obtaining additional funding for the Coast Guard within the DOT budget is likely to be difficult because of competition with other entities within the DOT appropriation, such as the FAA and Amtrak, for available discretionary funding. For example, recent action by the Congress limited FAA's ability to use a separate funding source (the Airport and Airway Trust Fund) to fund



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FAA's operations.<sup>14</sup> As a result, funding for FAA's operations now competes for the same limited DOT dollars on which the Deepwater Project would rely. FAA also expects its operating costs to increase to \$7.4 billion by 2003, a 42-percent increase from 1998 levels. Similarly, Amtrak estimates that its capital needs alone will amount to about \$1.5 billion annually through fiscal year 2020, part of which would come from the DOT budget.

Outside of DOT, the overall budget process is still driven by caps in discretionary spending.<sup>15</sup> If these caps (which currently cover through fiscal year 2002) are extended as the administration has proposed, funding for the Deepwater Project would have to come from cuts in some other agency or program. The percentage increase in the Coast Guard's budget request is among the largest of all federal agencies. However, the Coast Guard is basing its plans for the Deepwater Project on another major boost in funding beyond 2002. Thus, for all these reasons, sustaining the Deepwater Project at the funding level the Coast Guard is currently planning to use in its RFP appears to be a difficult task over a sustained period.

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<sup>14</sup>The Wendall H. Ford Aviation Investment and Reform Act for the 21st Century (P.L. 106-181), also known as AIR-21, calls for FAA's airport improvement program and facilities and equipment accounts to be funded at authorized levels before any revenues from the Airport and Airways Trust Fund are allocated to FAA's operations account. According to the DOT Inspector General, barring a tax increase, Trust Fund receipts and interest will clearly be inadequate to fund all of FAA's operations costs.

<sup>15</sup>Statutory limits on total discretionary spending 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 the federal government's 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.

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## Developing Deepwater Around Lower Funding Scenario Would Help Reduce Risk

Our concern about this risk is not new. In several previous reports<sup>16</sup> on the Coast Guard's planning for the Deepwater Project, we expressed concern about the Coast Guard overestimating the amount of funding that would be available in the future for the project. The Coast Guard agrees that funding for the Deepwater Project is high risk and that it provides limited funding flexibility but believes it should keep its current approach of developing the project around the planned funding stream. Coast Guard managers believe that a deepwater system funded at planned levels provides the optimum system to meet deepwater requirements. The agency also believes that OMB budget targets could rise in the future and that the Congress could appropriate more funds to meet the agency's capital needs. However, the potential risks are substantial and another strategy appears warranted. That strategy would be to develop a lower funding scenario around which the contractors can develop their proposals. If the project needs to be adjusted to a lower, more realistic funding stream, the time to do so is before the contract proposals are finished later this year.

Directing contractors to develop proposals around a lower funding scenario aligned with OMB targets would have several advantages.<sup>17</sup> First, the Coast Guard would have greater opportunity to evaluate which proposal will produce the best value to the government within likely budget constraints. Second, the agency would be in a better position to hold the contractor accountable for delivering a system that meets original

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<sup>16</sup> *Coast Guard's Acquisition Management: Deepwater Project's Justification and Affordability Need to Be Addressed More Thoroughly* (GAO/RCED-99-66, Oct. 26, 1998). *Coast Guard: Key Budget Issues for Fiscal Years 1999 and 2000* (GAO/T-RCED-99-83, Feb. 11, 1999). *Coast Guard: Strategies for Procuring New Ships, Aircraft, and Other Assets* (GAO/T-RCED-99-116, Mar. 16, 1999). *Coast Guard: Budget Challenges for 2001 and Beyond* (GAO/T-RCED-00-103, Mar. 15, 2000). *Performance and Accountability: Challenges Facing the Department of Transportation* (GAO-0-443T, Feb. 14, 2001).

<sup>17</sup> DOD provides a good example of how the linkage between the capital planning and budgeting processes can be made and used to make budgeting decisions on capital projects, such as the Deepwater Project, and to manage them effectively. DOD links its capital planning process to its budget through its Future Years' Defense Plan, which is updated each year to reflect changing conditions. This plan is linked to OMB budget targets and used to make programming and budgeting decisions over a 5-year budget cycle. It identifies strategies for meeting budget targets, such as cost-savings in operations that could be used to help fund capital requirements. In addition, according to an OMB official, the plan identifies the funds needed to complete projects and provides greater assurance that these funds will be available, which can ultimately lead to better-managed capital projects. The plan also allows the Congress to see where DOD is heading with its capital projects.

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schedule and cost estimates if it selects the plan developed at the lower funding level. Using realistic funding expectations will reduce the risk of schedule stretch-outs and cost increases with the contractor in a sole-source environment after the contract is awarded—a situation in which the government’s leverage is reduced because it does not have the benefit of competition for obtaining a fair and reasonable price.

Any projection about likely funding levels for a project that lasts as long as the Deepwater Project will involve an element of uncertainty and risk. The Coast Guard’s current funding scenario exacerbates that risk. Because the Coast Guard has not yet issued its request for contractors to submit their best and final proposals, there is still time to mitigate the risk by identifying a lower funding stream that contractors should use in developing their proposals.

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## Ability to Control Costs in Project’s Later Years Remains Uncertain

The deepwater contracting approach that the Coast Guard adopted has never been tried on a contract this large extending over 20 or more years. At the time it was adopted, there was little evidence that the Coast Guard had analyzed whether the approach carried any inherent difficulties for ensuring best value to the government and, if so, what to do about them.<sup>18</sup> We and others who are involved in reviewing this approach, such as OMB and the Office of Federal Procurement Policy, have expressed concerns about the potential lack of competition during the project’s later years and the reliance on a single contractor for procuring so much of the deepwater equipment. The Coast Guard is still conducting this analysis on its approach as it moves into phase 2 of the project and has delayed some of its key milestones to consider these concerns.

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## Little Evidence of Analysis Before Contract Approval Adopted

When the Coast Guard selected the contract approach in May 2000, it had not yet documented the risks involved or the degree to which this approach provided better value than other approaches. Contracting officials within the Coast Guard said their guidance from Coast Guard management had been to develop an approach that would (1) allow a single systems integrator to create a “system of systems” approach and (2) achieve potential improvements in operational effectiveness and minimize

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<sup>18</sup>For example, the Coast Guard’s risk-management plan did not include the contracting strategy as an issue that required monitoring or mitigation strategies.

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total ownership costs. Contracting officials told us that with these parameters in mind, they conducted a limited evaluation of several contracting alternatives by meeting informally with government and private sector officials about the Coast Guard's proposed approach and meeting internally to discuss possible strengths and weaknesses of three approaches.<sup>19</sup> Documentation detailing the basis for the decision—the depth of the analysis performed, the factors considered, the expertise sought (people contacted), and the compelling reasons why the current approach was chosen—was not recorded prior to its approval by Coast Guard acquisition officials. Without thorough documentation in this regard, the rigor of the Coast Guard's analysis of the approach is unknown.

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### Approach Has Limitations for Ensuring That Costs Are Controlled

When we initially reviewed the Deepwater Project proposed contracting approach in March 2000, we expressed concerns about whether it could keep costs from rising and ensure good performance once the contract is awarded.<sup>20</sup> We discussed the Coast Guard's approach with contracting experts from both the public and private sector who, in addition to their concern about the Coast Guard's ability to control costs, also raised concerns about certain management-related issues, which we cover later in this report. Presently, we focus on the cost-related issues of concern, namely the potential absence of competition for subcontracts in the project's later years and the heavy reliance on a single-systems integrator to procure the entire system.

### Potential Absence of Competition in the Project's Later Years

OMB guidance recognizes the value of competition as a lever to keep contract costs down. The benefits of competition are present in the contract's early years, as are other approaches for controlling costs. For the initial 5-year award term contract, prices for equipment and software to be procured are based on competition; and when the contract with the

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<sup>19</sup>The three approaches were (1) using a mix and match strategy that involved contracting with a systems integrator and then competing individuals classes of Deepwater ships, aircraft, systems or services in accordance with the systems integrator's deepwater design; (2) recompeting the systems integrator's contract every 5 years; and (3) awarding a single contract to the systems integrator and acquiring all subsequent acquisitions through task orders in accordance with the systems integrator's design.

<sup>20</sup>*Coast Guard: Budget Challenges for 2001 and Beyond* (GAO/T-RCED-00-103, Mar. 15, 2000).

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systems integrator is awarded, these prices will be fixed, according to Coast Guard officials.<sup>21</sup> The Coast Guard also hopes to control costs by encouraging the use of commercially available (nondevelopmental) equipment. Prices for such equipment can be determined on the basis of previous orders from other buyers and by the use of fixed-price contracts.

Beyond the first 5-year award term contract, however, the benefits of competition are less certain. In a practical sense, the opportunity for competition in the project's out years is diminished because the systems integrator will likely contract with those suppliers that were part of the team putting together the offer rather than opening the contract to a wider set of offerors. Coast Guard officials currently believe that a profit motive could drive the systems integrator to open competition to a wider set of offerors. Although this is possible, it would be easier to integrate equipment or subsystems acquired from a team member since equipment will be procured based on the plan developed by the team. A Coast Guard analysis of the same issue draws this same conclusion. We believe that this potential lack of competition reduces the normal marketplace control on price and subjects the Coast Guard to situations in which the supplier could potentially drive up project costs.

The Coast Guard is attempting to develop strategies for encouraging competition among suppliers, and thereby controlling costs, in subsequent 5-year award term contracts. One approach involves providing incentives for the systems integrator to submit "competitive proposals"—that is, proposals that are reasonably priced—beyond the first few years of the contract. Contracting experts brought in by the Coast Guard discouraged this approach, saying such incentives usually have limited effectiveness. As a result, the Coast Guard now indicates it will evaluate the systems integrator's performance in minimizing total ownership costs as part of its decision of whether to renew the systems integrator's contract. By doing so, the Coast Guard hopes that this will encourage the systems integrator to have competition. At this point, it is not clear what effect this evaluation would have.

A second approach the Coast Guard plans to take is to negotiate a ceiling on the amount that will be paid for deepwater equipment in the 5-year

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<sup>21</sup>The Coast Guard expects the contract will have a provision allowing adjustments to prices due to changes in funding or project requirements.

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period covered by a follow-on, award-term contract. This is a continuation of the approach being taken for the first 5-year contract. However, the ceiling could be waived if the project's schedule or requirements are changed. Given the funding-related concerns discussed earlier, the potential for such changes cannot be easily dismissed. If such changes occur, the Coast Guard will rely on the systems integrator to negotiate prices with its vendors in a sole-source environment. Although doing so is a valid alternative for pricing a contract, a sole-source environment leaves little leverage in negotiations and therefore carries a higher risk of goods being overpriced. This approach also carries the burden of obtaining and reviewing cost and pricing data from suppliers and the systems integrator.

#### Reliance on Single Contractor

Another cost-related concern involves dependence on the systems integrator for a deepwater system that will take 20 or more years to acquire. This dependence is both one of the main strengths of the approach and one of its main weaknesses. On the positive side, if all aspects of the approach work well, the systems integrator will form a partnership with the Coast Guard and provide the technical expertise to assemble an integrated system and the continuity needed to bring a long-term project to a successful conclusion. However, the approach could establish the integrator as a monopoly supplier, substantially constraining the Coast Guard's options or leverage. The Coast Guard could be in a weak position to negotiate aggressively on price because of its reluctance to take on the risks of increased costs and other problems associated with switching systems integrators. For example, if the systems integrator's performance is unsatisfactory, a new systems integrator will have to step in to implement someone else's partially completed design; or the Coast Guard will have to adopt a more traditional approach of buying individual classes of ships or aircraft, according to Coast Guard officials. The learning curve and other complications involved in such a midcourse adjustment could be dramatic and would probably be very costly.

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#### Steps to Mitigate Contracting Risks Still Under Way

As our work progressed, we expressed our concerns to the Coast Guard immediately rather than waiting until the end of our review. As we raised these concerns, the Coast Guard took additional steps to study them. However, some of these efforts are still under way, and decisions have not been made on all specific measures to be incorporated into the acquisition plan and the RFP for the Deepwater Project.

In September 2000, we urged the Coast Guard to take several actions to deal with the risks of the contracting strategy it had selected. We suggested that the Coast Guard identify and evaluate all viable contracting

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approaches, discuss the approaches with contracting experts, and document the results. In particular, we stated that the Coast Guard should be open to options that would maximize the benefits of competition in later years while still maintaining the interoperability of the system. We also urged the Coast Guard to convene an independent panel of contracting experts from the government and private sector to review the proposed deepwater contracting approach or whatever approach the Coast Guard selected. We felt that given the contract's uniqueness and the risks it poses, a rigorous review by a widely represented panel of experts was essential to both validate the Coast Guard's approach, and recommend potential mitigating measures to strengthen it.

In December 2000, the Coast Guard proposed a limited peer review—one involving experts only from DOD and GAO and consisting of a 3-hour process (a 1-hour presentation on the contracting approach that the Coast Guard plans to use, followed by a 2-hour question-and-answer session). Because of our concerns about the limited nature of this approach, the Coast Guard—with our advice and assistance—expanded the panel of experts and adopted a more extensive, structured format. OMB officials share our concerns about the contracting approach, and they support the need for a peer review and a careful consideration of issues raised before the RFP and acquisition plan are finalized.<sup>22</sup> We also urged the Coast Guard to provide the experts with key documentation, namely the acquisition plan and excerpts from the draft RFP prior to the meeting. Doing so would better ensure that the members of the panel have an objective basis for evaluating the Coast Guard's contracting approach. However, the Coast Guard decided not to provide such documents to the panel members in advance, but instead provided them with selected excerpts from the acquisition plan. The entire acquisition plan and RFP was available for the panel upon request.

Subsequent to our discussions with Coast Guard management, the Coast Guard contracted with two outside consultants to review the proposed contracting approach for the Deepwater Project. One consultant<sup>23</sup> was tasked to develop and recommend a contracting strategy for the deepwater system, given the Coast Guard's requirement for an integrated "system of systems" solution. The consultant determined that the Coast

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<sup>22</sup>The Coast Guard plans to finalize its acquisition plan in early 2001.

<sup>23</sup>The Coast Guard contracted with Performance Management Consulting, Inc., to review its contracting strategy. The firm submitted a summary of its findings in January 2001.

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Guard should continue with the approach it selected. However, citing cost increases and limited cost negotiation leverage as weaknesses, the consultant identified risk mitigation strategies, such as including in the RFP requirements for increasing competition over the mid to long term. A second consultant<sup>24</sup> evaluated the draft RFP. He noted that this was one of the most complex contracts he had ever seen and suggested that it be simplified. For example, he suggested that the Coast Guard consider using incentives as part of the provisions of the award-term contract rather than as a separate item. He also observed that the success of the contracting approach is dependent on the Coast Guard receiving the planned funding stream.

To address the concerns raised by the consultants and to provide some time to respond to additional concerns that might be raised by the peer review, the Coast Guard has altered its planned date for issuing the deepwater RFP. The Coast Guard now plans to release the RFP in June 2001, or about 2 months later than its initial schedule. The Coast Guard is still responding to comments from its consultants and industry. Making necessary revisions to the RFP before giving it to contractors is important, because the RFP represents the contractual basis upon which the Coast Guard and the contractor will develop their relations. Also, changing the RFP after it has been issued could result in contractors having to amend their offers.

At this point, we do not know what changes the Coast Guard might adopt. Until adequate steps are in place to address concerns expressed by its consultants and by members of the peer review, we believe the risk related to cost control remains high. The Coast Guard's success in this area also rests on how well it develops other sound strategies and options for managing potential problems. These strategies are discussed in the next section.

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<sup>24</sup>The Coast Guard hired John Cibinic, Jr., Professor Emeritus of Law, George Washington University, to review the draft RFP. He submitted a summary of his findings in January 2001.



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## Overseeing the Acquisition Phase of the Deepwater Project Poses New Challenges

Another area of potential risk involves the overall management and day-to-day administration of the contract. In this regard, the Coast Guard's performance during the planning phase has been generally excellent. During this phase, the Coast Guard took several innovative steps to establish and communicate what it wanted contractors to do, and it had adequate processes and trained staff in place to carry out the management tasks that needed to be done. As the project moves into the procurement phase, these challenges become more difficult, in large part, because the scope of work is so much greater and the contracting approach is unique and untried. It is too early to know if the Coast Guard can repeat the same strong performance on this much larger scale, because plans for managing and administering the deepwater contract are still being developed. The major challenges the Coast Guard faces involve developing and implementing plans for (1) establishing effective human capital practices, (2) having key management and oversight processes and procedures, (3) forming close relationships with subcontractors, (4) funding useful segments of the project, (5) tracking data to measure contractor performance, and (6) having an exit strategy and a contingency plan in the event of poor performance by the systems integrator.

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## Project Management During the Planning Phase Was Generally Excellent

In the planning phase of the project, the Coast Guard applied a number of "best practice" techniques recommended by OMB and others.<sup>25</sup> Among them are the following:

- The Coast Guard gave contracting teams mission-based performance specifications, such as the ability to identify small objects in the ocean, rather than asset-based performance specifications, such as how large a cutter should be, and then it gave them leeway in deciding how to meet these specifications. Specifying performance criteria is the more traditional approach.
- The Coast Guard established a management structure of Coast Guard and contractor teams for rapidly communicating technical information. Among other things, these teams assess each contractor's evolving proposal to determine if it will meet contractual requirements and identify issues that could potentially have unacceptable effects. Communication mechanisms include an Internet Web site.

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<sup>25</sup>Best practices are those that have been found to work well and that are generally recommended by OMB and others.

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- The Coast Guard highlighted the use of “open-system architecture” and emphasized the use of commercially supported products in the equipment to be acquired. This means that communication and computer equipment can be more easily replaced and upgraded without proprietary software or other unique requirements.

The Coast Guard also had effective procedures and a management structure in place for this phase of the project. Using a model developed by Carnegie Mellon University,<sup>26</sup> we assessed the procedures and structure in eight key areas—planning, solicitation, requirements development and management, project management, contracting and oversight, evaluation, transition and support, and risk management. Within these 8 areas, we examined 112 key practices and found no significant weaknesses.<sup>27</sup> In fact, the Coast Guard’s procedures and management structure for these eight areas were among the best of all the federal agencies we have evaluated using this model. This provides a good foundation for developing and implementing sound procedures for the next phase of the project; however, in many ways, the challenges will be more difficult.

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### Coast Guard Faces Difficult Challenges During the Procurement Phase

As the project moves from the planning phase to the procurement phase, the Coast Guard must ensure that it can perform project management and contract administration activities at a high level, given the complexity and scope of the contract and its uniqueness. Under the Coast Guard’s planned approach, the systems integrator will be responsible for program management required to implement the deepwater system, and the Coast Guard will continuously monitor the integrator’s performance. The Coast Guard plans to implement, or require the systems integrator to implement, many management processes and procedures based on best practices, but these practices are not yet in place. Because much work remains to be accomplished in this area, the full effectiveness of the Coast Guard’s approach cannot be assessed in the short term. The following are the key areas that will need to be addressed.

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<sup>26</sup> Carnegie Mellon University’s Software Engineering Institute’s Software Acquisition Capability Maturity Model. ©The Software Engineering Institute is a federally funded research and development center sponsored by the U.S. Department of Defense under contract to Carnegie Mellon University.

<sup>27</sup> Two of the 112 practices involved not having a plan for developing and managing project requirements and lack of specific measures to assess how requirements are being managed. In both cases, the weaknesses were not significant given the other strengths and compensating controls in place.

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## Effective Human Capital Practices

A critical element to the ultimate success of the project is having enough trained and knowledgeable Coast Guard staff to conduct management and oversight responsibilities. Project officials view this as a high-risk area and one of the most important aspects of the project. The Coast Guard hopes to have its full complement of staff needed for fiscal year 2002 by the time the contract is awarded. Currently, the Coast Guard has 69 personnel devoted to the Deepwater Project. According to project officials, the current project staff is highly qualified—most have advanced degrees in management, engineering-related, and other specialty fields. Moreover, the Coast Guard has made a conscious effort to maintain the continuity of its project staff by not rotating its military personnel on the project to new positions every 4 years as it normally does. In addition, the Coast Guard has assigned a Project Executive Officer to head the project.

Project officials have identified the need for 62 additional positions to manage the project beginning in fiscal year 2002. In addition, the officials plan to hire civilians with acquisition and contracting experience and to use support contractors for many activities. The Coast Guard is also in the process of developing a training plan for its project staff; it hopes to complete the plan later this year and ensure that all staff meet the training requirements for their respective positions by the time the contract is awarded.

## Key Management and Oversight Processes and Procedures

Under its deepwater acquisition approach, the Coast Guard will rely heavily on the systems integrator to establish a management organization and systems necessary to manage the major subcontracts for deepwater equipment. The systems integrator will be required to apply an integrated product and process development approach,<sup>28</sup> including teams consisting of Coast Guard, contractor, and major subcontractor personnel who are responsible for specific areas of the program. Also, the systems integrator will be responsible for developing key systems and processes, such as risk

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<sup>28</sup>An integrated product and process development approach, using integrated project teams, is a best practice for managing major acquisition programs cited in OMB's Capital Programming Guide (Supplement to OMB Circular No. A-11), Part 3: Planning, Budgeting, and Acquisition of Capital Assets.

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management, quality assurance, test and evaluation, and earned-value management systems.<sup>29</sup>

In addition, the Coast Guard is developing a program management plan to oversee the systems integrator. The major components of this plan are project planning; organization; and detailed planning documents, including individual plans for contract management, information management, and financial management. Although the Coast Guard plans to complete the program management plan before the contract is awarded, project officials told us that some individual plans, such as configuration and integrated logistics support plans, are dependent upon the system selected and cannot be finalized until after the contract is awarded.

## Close Relationships With Subcontractors

Because the use of major subcontractors to provide high-value equipment will be such an intricate part of the Deepwater Project, good relations and communications between the Coast Guard, the systems integrator, and the major subcontractors will be very important. Our past review of best practices on this issue suggests that leading organizations establish effective communications and feedback systems with their subcontractors to continually assess and improve both their own and supplier performance.<sup>30</sup> These practices not only helped key subcontractors to fully understand the firms' goals, priorities, and performance assessments, they also helped the firms to understand subcontractors' ideas and concerns. Our experience in evaluating DOD acquisition programs showed that it was important to establish such relationships not only with prime contractors but with subcontractors as well. For example, supplier relationships on one program we reviewed reflected DOD's traditional role of distancing itself from subcontractors. This role was traced, in part, to the fact that DOD had not articulated a particular subcontractor policy to guide program managers. We recommended—and DOD agreed—that DOD establish a policy and incorporate it into acquisition plans for major procurements.

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<sup>29</sup> Earned value is a management technique that relates resource planning to schedules and to technical, cost, and schedule requirements. All work is planned, budgeted, and scheduled in time-phased "planned value" increments constituting a cost and schedule measurement baseline. As work is performed, it is measured against planned goals, and any difference is called a variance.

<sup>30</sup> *Best Practices: DOD Can Help Suppliers Contribute More to Weapon System Programs* (GAO/NSIAD-98-87, Mar. 17, 1998).

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The Coast Guard has developed no general policy on subcontractor relationships. Major subcontractors will be part of the integrated product and process development teams, and the Coast Guard plans to perform quality assurance activities at subcontractors' facilities. However, according to project officials, the program management and quality assurance plans have not been completed, and it is not clear at this time what the quality and nature of the Coast Guard's relationship with subcontractors will be.

**Full Funding in Advance of Buying Equipment**

OMB Circular A-11, Part 3, emphasizes that each useful segment (e.g. an entire ship or an entire aircraft) of a capital project should be fully funded in advance of incurring obligations. The Coast Guard has told its contractors to develop their deepwater schedules by using full funding of useful segments rather than incremental funding. Coast Guard contracting officials have said that they plan to obtain full funding for a ship or aircraft before proceeding with their procurement. However, if deepwater plans need to be adjusted due to a shortfall in funding or changes in program requirements, according to the officials, one option could be to develop requests that fund only part of a ship or aircraft. We found in a review of earlier Coast Guard budget justifications that the Coast Guard had proceeded with some capital projects before the amount of full funding was obtained.<sup>31</sup> According to OMB, proceeding with such incremental funding could result in schedule delays or higher costs for capital projects. As the Coast Guard proceeds with the Deepwater Project, it should ensure that its budget requests are consistent with OMB guidelines on full funding of useful segments to avoid attendant delays and increased costs.

**Accurate and Complete Data to Measure Contractor Performance**

The Coast Guard plans to award follow-on, award-term contracts on the basis of factors such as improving operational effectiveness and minimizing total ownership costs. To measure the performance of the systems integrator in achieving these goals (as a basis for awarding the follow-on contracts), the Coast Guard will use a simulation model to measure improvements in operational effectiveness and will compare the contractor's actual cost reductions with their proposed costs. According to Coast Guard officials, they will develop a new baseline for these factors on the basis of the winning contractor's plans and the most current

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<sup>31</sup> *Budget Issues: Incremental Funding of Capital Asset Acquisitions* (GAO-01-432R, Feb. 26, 2001).

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information on deepwater equipment after the contract is awarded in early 2002.<sup>32</sup>

Coast Guard officials told us that they plan to use a subjective rating system to assess the contractor's performance rather than use database benchmarks for improvements in operational effectiveness and total ownership costs. According to Coast Guard officials, setting such benchmarks may be difficult because performance data may reflect factors that did not result from actions of the contractor. For example, improved intelligence on drug smugglers could result in improvements in operational effectiveness. Also, changes in fuel costs could cause operational costs to increase. Because a host of factors could cause changes in these data, it will be important for the Coast Guard to carefully track these measures and accurately identify and segregate reasons for the changes that occur. Doing so would better show the results of significant federal investments in ships and aircraft.

#### Contingency Planning and Exit Strategies

Given the Coast Guard's heavy reliance on a single systems integrator for so many facets of the Deepwater Project, the agency is at serious risk if—for whatever reason—the systems integrator does not perform as expected or decides to walk away from the project on its own. For example, if the systems integrator's performance falls short of expectations, the Coast Guard will face numerous options, ranging from closer oversight to termination of the contract. Faced with these options, having a carefully thought-out contingency plan, which identifies and analyzes the implication of potential actions, would solidify the Coast Guard's ability to respond effectively. Several high-level federal contracting officials echoed this position, saying that given the circumstances for this particular project, exit strategies and other means to deal with potential poor performance by the systems integrator were highly desirable.

In the extreme case—where the contractual relation with the systems integrator is terminated—an exit strategy identifying possible alternatives, consequences, and transition issues would be important. In this regard, contracting officials with the project told us that the contract will provide

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<sup>32</sup>The current baselines for operational effectiveness and total ownership costs are based on 1998 data. Since 1998, the Coast Guard has received funds to buy additional ships and aircraft that are involved in deepwater missions, and these need to be considered in developing a baseline for operational effectiveness. In addition, it has more current cost data (e.g., rising fuel costs) that need to be included in total ownership cost estimates.

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several “off-ramps” and that the Coast Guard has basically two options if it were to terminate the systems integrator: (1) obtain a new systems integrator and a new set of subcontractors as well and (2) revert to the traditional “stovepipe” procurement approach of procuring a single class of vessels and aircraft at a time. These officials said that from a project management standpoint, having a strategy to deal with options like these is important; and the agency is currently documenting, with assistance from a contractor, the pros and cons of each exit strategy. However, the officials noted that specific, detailed plans to implement the options would not be developed until it was known that the Coast Guard planned to terminate the contract.

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## Use of Off-the-Shelf Technology Minimizes Risks, but Effective Means to Assess Unproven Technology Is Lacking

The risks associated with incorporating new unproven technology<sup>33</sup> into the first part of the Deepwater Project are minimal, in part, because of the Coast Guard’s emphasis that industry teams use technology that has already been proven in similar applications. Our main concern is the absence of criteria to measure the risk of the new technology that needs to be developed, both now and in the project’s later years.

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## Coast Guard’s Approach Conforms With Best Practices for Technology Development

Too little assessment of the risks associated with developing new technology has caused problems on many acquisition projects, both in government and the private sector. OMB’s Capital Programming Guide (A-11) states, “Probably the greatest risk factor to successful contract performance is the amount of technology development that is planned for the procurement.” Minimizing a technology’s unknowns and demonstrating that it can function as expected significantly reduce such risk. We have found that leading commercial companies use disciplined processes to demonstrate—before fully committing to product engineering and development—that technological capability matches project requirements. Waiting to resolve these problems can greatly increase project costs—at least 10-fold if the problems are not resolved until

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<sup>33</sup>For this report, we are using the term technology to denote assets, systems, equipment, and components proposed for the Deepwater Project.

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product development, and as much as 100-fold if they are not resolved until after production begins.<sup>34</sup>

The Coast Guard has taken steps to minimize these risks. One major step was to emphasize in contracting documents to industry teams that, to the maximum extent possible, proposed assets, systems, equipment, and components are to be nondevelopmental or commercially available (off-the-shelf) items. Our review showed that the teams' preliminary proposals included many commercial off-the-shelf and nondevelopmental items currently operating in the commercial or military environment. However, some proposed equipment included developing technology that has not yet been proven. Generally, these developing technologies are at the prototype level and are undergoing performance testing and evaluation prior to contract award to commercial and military customers.

The Coast Guard's steps are helping to keep the risk of unproven near-term technology at a low level. We measured the maturity level for the project's most critical near-term technologies (those introduced in the first 7 years of the project), using an approach developed by the National Aeronautical and Space Administration (NASA). We applied this process, referred to as technology readiness levels (TRL), to 18 technologies identified as critical by the 3 contractor teams and the Coast Guard. We determined—and the Coast Guard concurred—that by the time the contract is awarded, 16 of the 18 are expected to be at a level of acceptable risk.<sup>35</sup> The remaining two technologies will be slightly higher in risk; but in one case, an early prototype is being tested, and in the other, a proven backup system has been identified that, if needed, could replace the technology with no effect to the project's cost, schedule, or performance. Entering phase 2 of the project with critical technologies at a high level of maturity or with proven backup systems significantly

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<sup>34</sup> *Defense Acquisition: Employing Best Practices Can Shape Better Weapon System Decisions* (GAO/T-NSIAD-00-137, Apr. 26, 2000).

<sup>35</sup> TRL readiness levels are measured on a scale of one to nine. Examples of the ratings are as follows: a rating of one signifies that studies of the basic concept have been done; a rating between three and six means that success has been demonstrated to a degree in laboratory situations; and a rating of nine means that the technology has been proven in operational mission conditions and is in final form. To be considered acceptable for committing to a contract award, a new technology or adopted system should be rated at seven or higher. A rating of seven means that a system prototype has been demonstrated in the operational environment.



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lowers risk and the likelihood of delays, which in turn helps to control program costs.

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### Criteria to Adequately Monitor and Assess Technology Maturity Are Lacking

Although technological risks appear minimal in the near term, the Coast Guard lacks criteria for assessing the maturity of technology in the longer term.<sup>36</sup> The Coast Guard has a risk-management plan in place, as well as a process to identify, continuously monitor, and assess technology risks; and the resources the Coast Guard expects to commit to the task during phase 2 appear to be adequate. What the process lacks, however, is uniform and systematic criteria for judging the level of technology maturity and risk, such as the TRL ratings in the approach we adopted from NASA. In contrast, since January 2001, DOD has required the use of TRL criteria as a tool for measuring the technology readiness of its procurement projects.

Such criteria are important for monitoring both continued development of the technologies we examined and the development of other technologies that will not be used until later in the project. As of July 2000, when we completed our TRL assessment, half of the 18 deepwater key technologies we reviewed were still below the maturity level considered an acceptable risk for entering production. Before the contract is awarded, the Coast Guard must assess the readiness of these technologies. In addition, the industry team proposals include numerous technologies that are planned for deepwater system introduction from 2009 to 2020—well after contract award. Many of these future technologies will not be proven at contract award and will need to be assessed for technology risk before acceptance. The Coast Guard plans to have a test and evaluation master plan in place by June 2001, but it is not planning to include a requirement for using TRL criteria to measure technology readiness in that plan.

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## Conclusions

The Coast Guard's acquisition strategy and contracting approach for the Deepwater Project are innovative. The agency plans to use the full flexibility provided by congressional reforms of the federal acquisition process to avoid the all too frequent failures of major federal acquisitions in the past. Despite the numerous commendable innovations during the concept development phase, we remain concerned that considerable risks

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<sup>36</sup>According to the Coast Guard, the draft RFP includes a requirement for assessing the maturity of technology at the time of delivery.

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remain with its chosen approach for the procurement phase of the acquisition.

The Coast Guard's contracting approach for the production phase of the deepwater acquisition is unique—relying on a single contractor to manage, build and integrate the modernization of its entire deepwater fleet over a period likely to exceed over 2 decades. The key promise of the approach is achievement of a fully integrated system that both maximizes improvements in operational effectiveness and minimizes total ownership costs (including not only the acquisition, but operation, maintenance, and support costs of the entire system over a 40-year period).

While we recognize the merit of exploring innovative and even unique approaches, we believe the selected approach puts at risk precisely the purported benefits of the approach—that is, maximizing operational effectiveness and minimizing operational costs. Development of this unique and untried approach on such a large scale and for an acquisition so critical to the Coast Guard's ability to perform every aspect of its deepwater mission puts a heavy burden on the Coast Guard. Not only would it be reasonable to expect a rigorous effort to identify and mitigate all the major potential risks associated with a totally new approach, but the Coast Guard would also need to ensure that other approaches were fully evaluated. Unfortunately, we found that the Coast Guard has yet to accomplish either. At our urging, the Coast Guard has only recently sought to set up a systematic effort to identify and mitigate risks associated with its chosen approach and the evaluation of alternative approaches remains limited and poorly documented.

We remain concerned that the Coast Guard will soon be making critical decisions regarding the Deepwater Project, namely issuing the RFP in less than 2 months and awarding a contract to procure deepwater equipment in less than a year. Yet, significant risks still exist, and the Coast Guard has not completed actions to fully address them. The unique contracting approach of relying on a single systems integrator to manage, acquire, and integrate all Deepwater assets and capabilities poses two major risks, both of which still remain. First, the agency's choice of a contracting approach is now inextricably tied to a projected deepwater funding level of over \$500 million annually for the next 2 to 3 decades. Attaining sustained funding for the project at this level looms as the major potential problem. By choosing to proceed with a funding scenario that appears to be unrealistically high in the face of budget projections that are substantially less, the Coast Guard is increasing the risk that the project will incur future cost increases and schedule stretch-outs. Second, the Coast Guard's

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reliance on a single contracting team raises serious questions regarding the Coast Guard's ability to control costs and ensure performance once the contract is awarded. Their strategy for adequately controlling costs in the project's later years is still being worked out and requires careful attention before the RFP is issued. Similarly, the Coast Guard is still developing plans for managing the contract, and much remains to be done. These are risks that need to be well understood and resolved before the RFP is issued. Moving ahead before addressing the major risks and evaluating options for addressing them, potentially including an evaluation of alternative approaches, would be unwise.

The Coast Guard's acquisition approach for the Deepwater Project—and its reliance on a large and sustained funding level over a long period—makes the Congress' next decision on the project crucial as well. This decision goes far beyond deciding what Coast Guard equipment needs to be replaced or modernized. The Congress is in effect being asked to provide the first installment based on the Coast Guard's spending plan for the project, which is essentially dependent on a continuous funding stream in excess of \$500 million annually for decades. Allowing the project to proceed as planned and then later reducing that funding level significantly would result in higher system costs and reduced system performance. We think this is the central risk posed by the current approach, and that the Congress needs to make its decision about providing funding for the project this year with clear knowledge that the Coast Guard's chosen contracting strategy depends heavily on a sustained high level of funding for at least the next 20 years.

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## Recommendations for Executive Action

We recommend that before the Coast Guard issues the RFP for the Deepwater Project, the Secretary of Transportation should

- ensure that a realistic level of funding, based on OMB budget targets, the Coast Guard's capital planning process, and congressional guidance is incorporated into the RFP and used by contractors as the basis for designing their proposed systems; and
- direct the Commandant of the Coast Guard to carefully consider and incorporate recommendations, if any, made by the peer review panel into the deepwater acquisition plan and RFP or if the peer review panel finds serious and unmitigated risks in the Coast Guard's approach, evaluate alternative contracting strategies that could address the risks.

Before the Coast Guard signs a contract with the systems integrator for the Deepwater Project, we recommend that the Secretary of

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Transportation should direct the Commandant of the Coast Guard to address the following issues:

- complete development of the Program Management Plan, including plans and procedures to (1) facilitate relations with subcontractors, (2) ensure that the project is adequately staffed and that the staff is properly trained to perform their respective project management responsibilities, and (3) cover actions to be taken in the event that the Coast Guard decides not to continue its contract with the systems integrator;
- complete plans for ensuring that annual budget requests for the Deepwater Project are for useful segments and that a mechanism is in place for reporting to OMB and the Congress, as part of its annual budget submission, the progress that is made in achieving baseline goals of minimizing costs and improving operations due to investments in funding the Deepwater Project; and
- select a process, such as the technology readiness levels approach, for assessing the technology readiness of equipment and major systems to be delivered.

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## Matters for Congressional Consideration

The success of the contracting approach the Coast Guard selected for the Deepwater Project relies heavily on the Coast Guard being able to sustain the funding level around which the contractor's proposal is based. Substantial and prolonged funding below that level will lead not only to cost increases and schedule slippages, but also to situations in which the Coast Guard's ability to achieve its missions may be jeopardized. To avoid these situations, the Congress should have the opportunity to weigh in on the affordability of the project before the contract is awarded. Therefore, the Congress may wish to direct the Secretary of Transportation to (1) ensure that any funding scenario included in the RFP is based on OMB budget targets as well as discussions with appropriate congressional committees, (2) submit a report to Congress justifying the funding scenario and explaining any variations from the funding projections of OMB, and (3) wait 30 calendar days from submission of the report before issuing the RFP.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Transportation and the Office of Management and Budget for their review and comment.

In commenting on our draft report, DOT disagreed with our recommendation to incorporate more realistic levels of funding for the project into the RFP based on OMB's budget targets. In support of its position, DOT noted that OMB out-year funding targets have been

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converging with estimated project requirements during the last year, and it believes that OMB targets will change in the future to better match project requirements of \$500 million annually. DOT's position in this regard is counter to good capital planning and OMB guidance that says that agencies should plan projects within available funding levels. As noted in the report, the Coast Guard faces the real possibility of a cumulative funding shortfall of almost half a billion dollars, or over 20 percent of the total funding needs for the project's first 5 years. Ultimately, by the Coast Guard's own admission, funding levels significantly below project requirements would most likely lead to cost increases and schedule slippages and jeopardize the agency's ability to achieve its missions.

DOT agreed with two recommendations and did not comment on two others. The agency agreed to evaluate and incorporate into the RFP as appropriate recommendations from the peer review panel on its contracting approach for the Deepwater Project. Also, the agency agreed to complete development of the Program Management Plan prior to awarding the contract for phase 2. DOT had no comment on two other recommendations, which focused on (1) ensuring that its annual budget requests are for useful segments and that a mechanism is in place for reporting to OMB and the Congress on the progress in achieving baseline project goals and (2) selecting a process for assessing the technology readiness of equipment and major systems to be delivered. DOT's written comments and our response are in appendix V.

We met with officials from OMB, including the Chief, Transportation Branch. OMB concurred with our recommendations but believed that additional actions may be warranted. OMB has concerns about the deepwater acquisition strategy and believes that a broader evaluation of alternative strategies is needed. The agency indicated that the Coast Guard has chosen an approach that relies on a required funding level each year, and OMB has the same concerns that we do about the potential impact on the project if funding does not materialize as expected. OMB is also concerned that this approach sets up a situation where the administration and the Congress would have to fund the project in later years at the planned level, regardless of other competing priorities. Essentially, OMB believes that the deepwater funding strategy transfers the risk of program failure to external sources, such as the Congress. According to OMB, future funding levels cannot be guaranteed, and it would be inappropriate for the Coast Guard to use funding levels in the RFP that are not consistent with OMB's targets. Under the current acquisition approach, if sustained funding is substantially less than planned, the Coast Guard would have to rebaseline the project in a sole-source environment, a

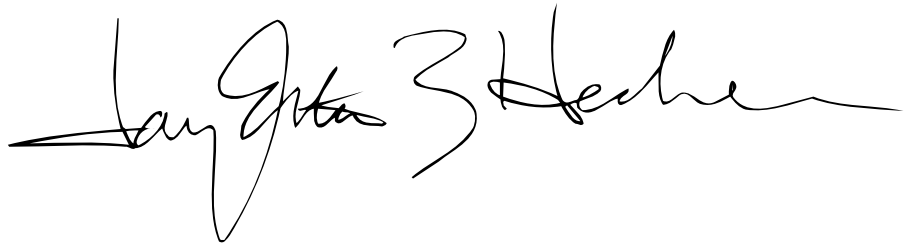
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situation that could increase project costs even further. Finally, OMB raised these concerns at the peer review panel meeting; however, OMB is not optimistic that the Coast Guard will sufficiently recognize and adequately address its concerns prior to issuing the RFP. We generally share OMB's concerns and have made many of the same points throughout our report.

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We plan to provide copies of this report to the Honorable Norman Y. Mineta, Secretary of Transportation; Admiral James M. Loy, Commandant of the Coast Guard; and the Honorable Mitchell E. Daniels, Jr., Director, Office of Management and Budget. We will also send copies to others upon request.

If you or your staff have any questions about this report, please call me at (202) 512-2834 or Randall Williamson at (206) 287-4860. Other key contributors to this report are listed in appendix VI.

A handwritten signature in black ink that reads "JayEtta Z. Hecker". The signature is fluid and cursive, with the first name "JayEtta" and the last name "Hecker" being the most prominent parts.

JayEtta Z. Hecker  
Director, Physical Infrastructure Issues

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# Appendix I: Objectives, Scope, and Methodology

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This report examined the major risks associated with the Deepwater Project and the progress the Coast Guard has made in addressing them. Our work focused on four risks: (1) planning the project around annual funding levels far above what the administration has told the Coast Guard it can expect to receive, (2) keeping costs under control in the contract's later years, (3) ensuring that procedures and personnel are in place for managing and overseeing the contractor once the contract is awarded, and (4) minimizing potential with developing unproven technology.

To assess the funding risk, we reviewed OMB Circular No. A-11, Part 3 (Planning, Budgeting, and Acquisition of Capital Assets); OMB's Capital Programming Guide, the Coast Guard's 5-year capital plan; and the agency's past budget requests for capital projects. We also reviewed various deepwater planning documents, including the risk management plan, the draft acquisition plan, and requests for proposal. We reviewed prior Coast Guard appropriations and pertinent laws affecting the Coast Guard's budget. We also reviewed DOT Inspector General reports on the Deepwater Project. We interviewed DOT and Coast Guard officials involved in forming the Coast Guard's budget, including the Coast Guard's Director of Resources. We also interviewed OMB budget officials and officials from the Office of Federal Procurement Policy.

To assess the risks of controlling costs, we reviewed the Federal Acquisition Regulation; OMB Circular A-11, Part 3, (Planning, Budgeting, and Acquisition of Capital Assets); and OMB's Best Practices for Multiple Award Task and Delivery Order Contracting. We reviewed the Coast Guard's draft acquisition plan and RFP for the deepwater phase 2 contract, reports that the Coast Guard received from consultants it hired to evaluate its acquisition strategy, and numerous Coast Guard documents regarding how the agency planned to acquire deepwater assets. We interviewed numerous contracting officials, including, Coast Guard contracting officials, officials from OMB's Office of Federal Procurement Policy, the former Deputy Under Secretary of Defense for Acquisition Reform, the Deputy Director for Defense Procurement, the Chief of the Internal Revenue Service's Contracting Branch, and an official of a private consulting firm. We also drew from our extensive agencywide contracting experience in reviewing DOD and other agency procurements.

To determine the risk involved in managing the contract, we assessed the Coast Guard's project management during the planning phase of the Deepwater Project and identified challenges the Coast Guard will face during the procurement phase. To identify best practices in contract management and administration, we reviewed OMB Circular No. A-11, Part

3, and drew from our extensive agencywide contacting experience in reviewing DOD and other agency procurements. We reviewed the Coast Guard's Project Management Plan, Risk Management Plan, and other management plans to identify the Deepwater Project's organizational structure and key management procedures used during the planning phase. We assessed the effectiveness of these procedures and structure using Carnegie Mellon University's Software Engineering Institute's Software Acquisition Capability Maturity Model® and its Software Capability Evaluation method. Although the model is specifically designed to determine software acquisition process maturity, its application can be used for the acquisition of any type of asset (ships, aircraft, etc.). The model ranks organizational maturity according to five levels. Maturity levels 2 through 5 require the verifiable existence and use of certain acquisition processes, known as key process areas. Satisfying the requirements of maturity level 2 demonstrates that an organization has the policies needed to manage a project and the procedures needed to implement those policies. We evaluated the acquisition processes for two Deepwater Project matrix product teams against all seven level-2 areas (planning, solicitation, requirements development and management, project management, contracting and oversight, evaluation, and transition and support) and one level-3 area (risk management). Within these 8 key process areas, we examined 112 key practices to determine their strengths or weaknesses. We reviewed the Coast Guard's draft acquisition plan and RFP for the Deepwater Project phase 2, comments that the Coast Guard received from the consultants it hired to evaluate its acquisition strategy, and other documents to identify how the agency plans to manage and administer the procurement phase of the Deepwater Project. We discussed these management plans with Coast Guard contract and Deepwater Project officials, the DOD Deputy Director for Defense Procurement, the Chief of the Internal Revenue Service's Contracting Branch, and a representative from a private consulting firm.

To assess the risk of using new technologies, we asked each of the three competing deepwater contracting teams to first develop a list of the most critical technology and keystone systems being proposed as "near-term" deepwater contract deliverables to be introduced during the first 7 years (2002 through 2008) after contract award. Eighteen technologies and systems were identified, including assets and components representing deepwater aviation, surface, and command, control, communications, computers, intelligence, surveillance, and reconnaissance concept solutions. We then asked the contracting teams to assess "technology readiness" for each of the items they identified on their lists using NASA's technology readiness level (TRL) criteria. TRLs provide a standard



definition of nine levels of technology maturity that can be used to measure technology readiness, regarding the type of demonstration that must be achieved; the scale (form, fit, and function) of the asset; and the operational environment in which demonstration is performed. We asked the contracting teams to score technology readiness at three points in the deepwater acquisition process—July 2000, April 2001, and January 2002. We focused our analysis on the technology readiness level at the date of contract award, January 2002. We independently met with program managers from each of the three industry teams to discuss the status of each technology/keystone system, identify the rationale for the initial TRL score assessment, and determine whether adjustments in the TRL score were necessary. On the basis of these discussions, we made adjustments to the initial TRL scores that the competing contractors agreed were consistent with the TRL criteria. We then crosswalked the TRL scores to project risk criteria established by the Air Force Research Laboratory that predicts project risk on the basis of technology readiness at program decision points. Specifically, the Laboratory established that a technology/key system should be at TRL 7 at the time the decision is made for a program to enter the Engineering and Manufacturing Development Phase—a phase we believe is comparable to the January 2002 deepwater contract award for “near-term” technology and keystone systems.

# Appendix II: Current Deepwater Cutters and Aircraft

Type of asset	Number	Description
<b>Cutters</b>		
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 each cutter 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 each cutter 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 each cutter 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 crew size of 16, a speed of 29 knots, and a cruising range of 3,928 nautical miles. The Coast Guard operates each for about 1,800 hours a year.
Mature class cutters (282-foot, 230-foot, and 213-foot cutters)	3	The 213-foot medium-endurance cutter, commissioned in 1944, has a planned crew size of 64. The 230-foot medium-endurance cutter, commissioned in 1942, has a planned crew size of 106. The 282-foot medium-endurance cutter, commissioned in 1971, has a planned crew size of 99.
<b>Total</b>	<b>93</b>	
<b>Aircraft</b>		
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 each of these aircraft for about 800 hours every year.
HU-25 medium-range surveillance plane	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 operates each for about 800 hours a year.
HH-60J medium-range recovery helicopter	42	This helicopter is capable of flying 300 nautical 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 each 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	93	This helicopter is capable of flying 150 nautical 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 each for about 645 hours a year.
<b>Total</b>	<b>206</b>	

Source: U.S. Coast Guard.

# Appendix III: Estimated Service Life of the Coast Guard's Deepwater Cutters and Aircraft

In our 1998 study on the Deepwater Project, we found that the Coast Guard had substantially understated the service life of its aircraft and, to a lesser extent, its ships. For example, in its project justification prepared in 1995, the Coast Guard estimated that its aircraft would need to be phased out starting in 1998. However, in 1998, a Coast Guard study showed that with proper maintenance and upgrades, its aircraft would be capable of operating until at least 2012 and beyond.<sup>1</sup> Also, a September 1999 study revised earlier estimates and concluded that the Coast Guard's deepwater cutters have a service life until 2007 and beyond, assuming that adequate funds remain available for maintenance support and service life upgrades.<sup>2</sup> Shown below are the differences in the service life of its deepwater ships and aircraft between the initial estimates (in the 1995 justification) and later studies.

**Table 3: Estimated Service Life of Deepwater Assets**

Type of asset	Years Acquired	Service life shown in the initial justification	Service life shown in recent studies
<b>Ship</b>			
378-foot high-endurance cutter	1967-1972	2003-2007	2008-2012
270-foot medium-endurance cutter	1983-1991	2012-2020	2013-2021
210-foot medium-endurance cutter	1964-1969	2002-2011	2007-2018
110-foot patrol boat	1986-1992	2005-2012	2000-2012
<b>Aircraft<sup>a</sup></b>			
HC-130 long-range surveillance airplane	1972-1987	1998-2008	2012-2027
HU-25 medium-range surveillance airplane	1982-1984	2002-2004	2030-2032
HH-60J medium-range recovery helicopter	1990-1996	2010-2015	2023-2030
HH-65 short-range recovery helicopter	1984-1989	2005-2009	2015-2019

<sup>1</sup> *Aviation Near-Term Support Strategy*, Office of Aeronautical Engineering, U.S. Coast Guard, (updated Oct. 28, 1998).

<sup>2</sup> *USCG WHEC/WMEC Fleet Condition and Remaining Service Life Study*, Nichols Advanced Marine, (Sept. 30, 1999).

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**Appendix III: Estimated Service Life of the  
Coast Guard's Deepwater Cutters and  
Aircraft**

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<sup>a</sup>The service life estimates shown in recent studies for aircraft are based on investing \$150 million for upgrades.

Sources: The Coast Guard's 1995 Deepwater Mission Analysis Report, the Coast Guard's 2000 Deepwater Mission: Current and Projected Requirements and Capabilities Report, and the U. S. Coast Guard's WPB Fleet Condition and Remaining Service Life Study (Jan. 31, 2001).

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# Appendix IV: List of the Members of Each Contracting Team

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During Phase 1 of the Deepwater Project<sup>1</sup>

**Litton/Avondale Industries** (Systems Integrator)

Boeing-McDonnell Douglas Corporation  
John J. McMullen & Associates, Inc.  
DAI, Inc.  
Raytheon Systems Company

**Lockheed Martin Naval Electronics and Surveillance Systems**  
(Systems Integrator)

Lockheed Martin Aeronautical Systems  
Lockheed Martin Electronics Platform Integration - Oswego, NY  
Lockheed Martin Global Telecommunications  
Lockheed Martin Management and Data Systems  
Sanders, A Lockheed Martin Company  
Litton/Ingalls Shipbuilding  
Litton/PRC  
M. Rosenblatt & Son  
Bell Helicopter Textron, Inc.  
Halter-Bollinger Joint Venture, L.L.C.  
Acquisition Logistics Engineering  
L-3 Communications East  
PROSOFT  
Whitney, Bradley and Brown, Inc.

**Science Applications International Corporation** (Systems Integrator)

Marinette Marine Corporation  
Sikorsky Aircraft Corporation  
Soza & Company, Ltd.  
Bath Iron Works  
AMSEC  
Fuentez Systems Concepts, Inc.  
Gibbs & Cox, Inc.

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<sup>1</sup>In keeping with the acquisition strategy delineated in the phase 1 proposal, the Center for Naval Analyses, and later Booz Allen & Hamilton, were selected to serve as the Independent Analysis Government Contractors (IAGC). The IAGC, like the industry teams, performed an analysis of deepwater equipment and the deepwater operating environment and developed an integrated deepwater system concept. Unlike the industry teams, however, the IAGC is prohibited from participating in the actual production; therefore, it is uniquely positioned to perform an impartial and objective analysis of relevant technologies, platforms, and implementation strategies and scenarios.

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**Appendix IV: List of the Members of Each Contracting Team**

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Clark Atlanta University  
Rockwell Collins

# Appendix V: Comments From the Department of Transportation

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



U.S. Department of Transportation

Assistant Secretary for Administration

400 Seventh St., S.W.  
Washington, D.C. 20590

April 19, 2001

Ms. JayEtta Z. Hecker  
Director, Physical Infrastructure Issues  
U.S. General Accounting Office  
441 G Street N.W.  
Washington, D.C. 20548

Dear Ms. Hecker:

The Department appreciates the opportunity to comment on the General Accounting Office (GAO) draft report, "Coast Guard: Progress Being Made On Deepwater Project, But Risks Remain." We are particularly pleased that the GAO draft report recognized the exceptionally strong performance to date of the Deepwater project team. The USCG used an innovative approach to this project, and it is gratifying to see GAO conclude that our performance reflects a number of "best practice" techniques recommended by the Office of Management and Budget (OMB), and in some areas represents performance among the best of all the Federal agencies GAO has evaluated. Nonetheless, the use of such innovative approaches is necessarily associated with some level of risk. The Coast Guard has met these risks and excelled. With continued support from Congress and the Administration, we are confident of meeting and surpassing the challenges we face as this project continues.

See comment 1.

The USCG Deepwater Capabilities Replacement Project (Deepwater) is of critical importance to the Coast Guard's continued effectiveness. Recapitalization of the Coast Guard's major assets is essential if the Coast Guard is to meet the Nation's needs in this new century. In December 1999, the Interagency Task Force on Coast Guard Roles and Missions determined that replacing Deepwater assets is a national priority and strongly endorsed the Deepwater process and timeline. Over the last several years, the Coast Guard has worked with the Congress and produced a sound Deepwater procurement strategy that will enable the USCG to perform its missions effectively and as economically as possible. The strategy is flexible, while assuring Coast Guard control over the systems integrator, and allows the project to respond effectively to changes in funding, technology, or mission requirements.

See comment 2

### **Planning Targets Have Been Converging With Project Funding Requirements**

Throughout the Deepwater project, USCG has worked effectively with OMB and the Congress to ensure that the project's funding requirements were clear and plausible. The President's FY02 Budget Request, and OMB's increasing outyear targets for the project demonstrate that the outyear funding targets have been converging. The President's FY02 Budget Request includes \$659 million for Coast Guard AC&I requirements, an increase of 26 percent over last year's target for FY02, \$520 million, and 59 percent over the FY 2001 appropriation. The OMB outyear funding targets have also been converging with estimated project requirements, as shown in the table.

See comment 3.

See comment 4.

The FY03 target in 2000 was	The FY03 target in 2001 was	The FY03 target in 2002 is
\$485 million	\$526 million	\$673 million

We are also grateful that Congress has shown its support for the project by providing the funding needed to proceed. The Coast Guard's efforts have focused on a funding level that attempts to minimize total ownership costs while having the assets in place when they are needed. Deviation from the planned funding levels will necessarily result in increased costs and could jeopardize USCG's ability to serve the American public at current mission levels. The draft RFP has adequate flexibility to respond, if necessary, to changes in outyear appropriation levels. As part of the annual review process following contract award, the USCG, will adjust the proposed system to meet government-required changes. Finally, the industry teams have used \$500 million per outyear as a planning parameter since March 1998. However, the USCG will include the OMB outyear targets as additional information in the RFP, with the understanding that these targets are supplemental information only, and will be adjusted annually as these targets have historically risen to meet the project's needs.

See comment 5.

**Peer Review Endorses Deepwater Approach**

During its review, GAO recommended that USCG convene a peer review to provide expert advice on key issues involved with Deepwater. An expert review panel was convened on April 12, which was extremely positive regarding the USCG's approach to Deepwater. The review covered issues including effective long term contracts and downstream competition, negotiating fair and equitable price adjustments, effectiveness of contractual exit strategies or off ramps, system integrator incentives, contract performance monitoring. We are encouraged that this objective panel, comprised of acquisition experts from both government and industry, was unanimous in its opinion that the Deepwater acquisition strategy represents the best approach to obtaining a system that optimizes mission performance requirements. While the panel's general consensus was that the overall strategy presents a "high risk" with respect to obtaining sustained funding over the life of the effort, the panel supported the approach as sound and representing the best approach for contracting a Deepwater system. The peer review panel did not find serious or unmitigated risks with the Coast Guard's contracting approach. The Coast Guard is reviewing the panel's comments and will adopt those recommendations, as appropriate, to minimize the Deepwater contracting risks.

See comment 6.

**Deepwater Funding Does Not Jeopardize Other Coast Guard Recapitalization Requirements**

The Coast Guard is able to fund Deepwater without adversely impacting other Coast Guard recapitalization requirements. For example, the National Distress & Response System Modernization Project, which will recapitalize the Nation's maritime 911 system, is fully funded under its current plan. Additionally, the shore facility outyear targets that are included in the FY02 5-Year Plan (FY02 – FY06) average \$60.8M, while the President's Request for the last five years (FY97 – FY01) included an average of \$60.M for shore facilities. Many recapitalization requirements that would historically be included with the Vessels, Aircraft and Other Equipment budget categories are within the Deepwater realm



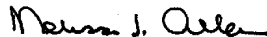
and will be funded within the future estimates for the Deepwater category. Due to the dynamic OMB outyear targets, it has been noted in recent 5-Year Plans that changes will be necessary based on Deepwater funding decisions. The Coast Guard Deepwater strategy and recapitalization requirements are flexible enough to respond to these changes.

**RFP Provisions Safeguard Future Competition**

The RFP and contract will include provisions that safeguard future competition. As a Delivery/Task Order – Award Term contract, the first safeguards to contract competition are the numerous off-ramps in the contract, which provide USCG the opportunity to exit the contract if price or performance is unsatisfactory. Further, the system integrator's profits will largely depend on producing high performance products at minimal prices, thereby encouraging the systems integrator to obtain maximum competition among the subcontractors. Additional terms will be awarded only if the systems integrator successfully passes an annual evaluation that reviews the contractor's performance in operational effectiveness, total ownership cost, subcontractor competition, and project management. The RFP will include incentives for small business subcontracting, incentives for delivery of new assets early and below budget, and incentives for exceeding the integrated deepwater system performance requirements. Further, future competition was addressed by the April expert review panel. It was agreed that the proposed structure of the contract would motivate the systems integrator to maintain a competitive environment. Finally, we'd like to note that the USCG has been working since October 2000, to complete a program management plan as recommended in the GAO draft report. The plan will be completed prior to awarding the Phase 2 Deepwater contract.

In closing, the Department would like to express its appreciation for the solid working relationship between the USCG Deepwater team and the GAO staff responsible for overseeing the Deepwater project. The project has benefited from the GAO staff's insights and expertise, and GAO's work has been conducted in a manner that exemplifies good government and ensures maximum value for the American taxpayer. Please contact Martin Gertel on 366-5145 with any questions.

Sincerely,



Melissa J. Allen

See comment 7.

See comment 8.

## GAO Comments

The following are GAO's comments on DOT's letter dated April 19, 2001.

1. Our report notes that the Coast Guard took many innovative steps and recognizes that the agency's procedures and management structure for the planning phase of the Deepwater project were excellent. While its management during the planning phase provides a solid foundation for the project, the acquisition phase presents considerably tougher challenges. By almost everyone's assessment, the acquisition strategy is a high risk, untried approach to procure deepwater assets. Whether the Coast Guard has adequately addressed these risks will not be known for years to come. Furthermore, the Coast Guard's handling of remarks and suggestions made by members of the peer review are largely unknown at this point.
2. The contracting approach lacks flexibility in several key areas. First, it requires sustained funding at planned levels of more than \$500 million for 2 or more decades. Second, it offers no true means to ensure competition for major components as a lever to minimize costs. Third, if planned funding levels are not realized, it opens the door to added costs because the Coast Guard would have to renegotiate costs and delivery dates—all in a sole source environment. Finally, changing the systems integrator after the contract is awarded—while doable—would likely be costly both in terms of dollars and delays in the project.
3. The added dollars expected from the Western Hemisphere Drug Elimination Act has allowed the budget targets to increase substantially from prior year (fiscal year 2001) targets. However, OMB told us that had it not been for the act, the large increase in the Coast Guard's targets for capital projects would have been difficult to achieve given the budgetary environment. While targets may increase somewhat in future years, any large increases would require new funding sources or shifts in funding from other entities, such as FAA and Amtrak, which also have critical capital needs. Already, the funding requirements for the project are almost half a billion dollars more than OMB budget targets through 2006. Given the uncertainty of future funding, it would be unwise and fiscally imprudent for the Coast Guard to blindly proceed with an RFP that contains a planned funding stream of \$500 million, hoping that funding at planned levels will materialize later. OMB echoed our position on this issue.

4. While the Coast Guard has the flexibility to alter project plans based on reduced funding levels in future years, the Coast Guard would likely pay dearly for this. The Coast Guard recognizes this but steadfastly opposes including a lower, more realistic funding level in its RFP. It has essentially rejected our concerns and those of OMB in this area and has adopted a position that runs counter to sound “best practices” for capital planning that are based on widely-accepted OMB guidance.
  
5. The Coast Guard’s characterization of the peer review panel’s deliberations and findings are overly optimistic and overstate the positive results from the panel. Our review of the transcript of the panel’s deliberations showed that there was not the unanimous consensus among panel members on the efficacy of the acquisition approach that was portrayed by the Coast Guard. For example, the panel member from the Office of Federal Procurement Policy voiced numerous concerns about whether a thorough and honest risk analysis of the acquisition approach had been done and whether adequate mitigation and management plans are in place. Another member also echoed this position, while another remarked that much work is needed before the RFP should be issued to contractors. We believe that such concerns by panel members do indeed refer to potentially serious and unmitigated risks that should not be dismissed lightly. In addition, given that panel members were not given the RFP or the acquisition plan prior to the panel meeting, we question the thoroughness of the panel’s results and the depth to which it explored key questions. It is evident from the transcript of the panel discussions and our observations of the proceedings that panel members may not have had a good grasp or understanding of many issues in the depth necessary to make informed observations and suggestions. For example, one panel member remarked in his summary at the end of the panel discussion that there was an information void on some issues when the panel began discussions, and having more detailed information on the acquisition strategy ahead of time would have been useful. OMB officials who observed the peer review session told us that they felt the same way. Moreover, the panel members were not asked to determine whether this approach represents the “best approach among all possible alternatives,” nor were panel members given the time or the information necessary to make such a determination.
  
6. To provide funding for the Deepwater Project, the Coast Guard will likely have to keep funding for other capital projects at levels which would be substantially lower than levels experienced over the last

decade or more. It is unrealistic to believe that other non-deepwater capital needs will be minimal for the entire duration of the Deepwater Project. The DOT Office of Inspector General, for example, has recently identified millions of dollars of potential capital projects associated with the Coast Guard's search and rescue program. Also, in its current fiscal year 2002 capital plan, the Coast Guard may have significantly understated amounts needed for information technology and other projects. For example, the current plan projects information technology funding needs of only \$3 million in 2005; its capital plan of just a year ago cited information technology project needs of \$31.4 million in 2005. Similarly, estimates of funding needs for shore facilities were \$128.8 million in the 2001 plan and only \$58.7 million in the fiscal year 2002 plan. Either the Coast Guard grossly overstated its non-deepwater needs in the fiscal year 2001 plan or it cut deeply into these projects for the fiscal year 2002 plan to accommodate funding for the Deepwater Project. Regardless, this leaves serious questions about whether the Coast Guard is understating funding needs for non-deepwater projects to give the appearance that the Deepwater Project funding needs can be met in the next 5 years.

7. While the Coast Guard has provisions in the RFP that allow it to exit the contract if price or performance is unsatisfactory, the practical reality is that changing the systems integrator will be costly, and there is a natural reluctance for an agency to do so. Members of the peer review panel remarked similarly on this issue. In addition, complete, reliable data on total ownership costs and operational effectiveness may be absent, especially in the project's early years, making those measures less effective as a means to evaluate contractor performance. Members of the peer review panel made this point as well. Also, the inclusion of contract incentives does not guarantee competition will exist among subcontractors. The panel did not reach unanimous consensus that such incentives would necessarily be effective in this regard, as the Coast Guard contends.
8. The Coast Guard did not comment on two recommendations that need to be addressed. Developing an effective assessment tool to evaluate the technology maturity of major equipment and components is critical to keep a tight rein on costs. Also, ensuring that future budget requests for deepwater components are for useful segments is essential. OMB strongly concurred with our view on these issues. Finally, keeping the Congress apprised of progress being made in achieving the baseline goals of minimizing costs and improving operations is vital as a basis

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for holding the Coast Guard accountable to the Congress and the administration for the significant investment in the project.

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# Appendix VI: GAO Contacts and Staff Acknowledgements

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## GAO Contacts

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## Acknowledgements

In addition to those named above, Marie Ahearn, Neil Asaba, Naba Barkakati, Alan Belkin, Christine Bonham, Sue Burns, John Christian, Tom Collis, Ralph Dawn, Paul Francis, David Hooper, Richard Hung, Matt Lea, Sterling Leibenguth, Lynn Musser, Madhav Panwar, Colleen Phillips, David Robinson, Katherine Schinasi, Stanley Stenersen, Mike Sullivan, and William Woods made key contributions to this report.



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