

GAO

Report to the Chairman, Subcommittee
on Transportation and Related Agencies,
Committee on Appropriations, House of
Representatives

May 1993

COAST GUARD

Management of the Research, Development, Test and Evaluation Program Needs Strengthening



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Resources, Community, and
Economic Development Division

B-253184

May 25, 1993

The Honorable Bob Carr
Chairman, Subcommittee on
Transportation and Related Agencies
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

The mission of the Coast Guard's Research, Development, Test and Evaluation (RDT&E) Program is to seek technological advancements that will improve the agency's operational capabilities. The program's annual appropriation averaged \$28 million in fiscal years 1992 and 1993. The Coast Guard's Research and Development (R&D) Center plans, manages, and carries out the agency's RDT&E projects. This report responds to your request that we determine if the Coast Guard has adequate (1) policies and procedures for selecting RDT&E projects and (2) management tools to effectively manage its R&D Center.

Results in Brief

The Coast Guard lacks two essential elements needed for selecting RDT&E projects. First, its definition of what constitutes RDT&E is not clear enough to guide the project selection process. As a result, a wide variety of projects are funded with RDT&E funds—from evaluating communications technology to assessing the cost-effective distribution of personnel. Without a clear definition of RDT&E, the Congress and the Coast Guard cannot be assured that RDT&E funds are being used for projects that are truly RDT&E. Second, the Coast Guard does not have an RDT&E plan that establishes RDT&E priorities agencywide or that links proposed and ongoing RDT&E projects to the agency's missions to ensure that limited RDT&E funds are meeting the Coast Guard's most urgent needs.

Furthermore, the Coast Guard does not have sufficient management tools for its R&D Center. Specifically, the R&D Center lacks (1) a management information system to monitor the performance of RDT&E projects and (2) an evaluation process to assess the impact of these RDT&E projects on Coast Guard operations. As a result, the Coast Guard cannot be assured that the RDT&E Program's resources are being used efficiently and effectively. In this era of fiscal austerity, the Coast Guard needs to better ensure that scarce resources are used to their optimum advantage.

Background

The RDT&E Program is under the general direction of the Chief, Office of Engineering, Logistics, and Development, at Coast Guard headquarters in Washington, D.C. The two key agency organizations responsible for the program are the R&D Staff, within the Office of Engineering, Logistics, and Development, and the R&D Center in Groton, Connecticut. For fiscal year 1993, these two organizations have a total staff of 146—12 on the R&D Staff and 134 assigned to the R&D Center. The primary responsibilities of the R&D Staff are to direct and manage the overall RDT&E Program. The Chief of the R&D Staff manages the RDT&E Program. The primary responsibilities of the R&D Center are to plan, manage, and perform RDT&E projects. RDT&E projects are conducted in-house by R&D Center personnel or contracted out to either other federal R&D organizations or commercial contractors. Projects contracted out are managed by R&D Center project managers, who act as the contracting officer's technical representatives.¹

The RDT&E Program focuses on applied research—applying technology developed by other government agencies and the private sector to Coast Guard use.² It also develops, tests, and evaluates techniques, concepts, systems, equipment, and material for possible use by the agency. According to the Coast Guard, the goal of each RDT&E project is to produce hardware, procedures, study reports, or complete systems that provide the most cost-effective solution to the problem being addressed. An RDT&E Program official said that the length of RDT&E projects ranges from 6 months to 5 years. In fiscal year 1993, funding for individual projects ranged from \$50,000 to \$1.4 million.

RDT&E projects are proposed by managers of Coast Guard headquarters operating (e.g., Operational Law Enforcement) and support (e.g., Personnel) programs on the basis of a program need or problem. For example, the Manager of the Short-Range Aids to Navigation Program requested RDT&E support because of a program need to reduce the yearly maintenance of the Coast Guard's lighted navigational aids. Program managers submit a request for RDT&E support to the R&D Staff, who, along with the R&D Center, evaluate the request to determine if the support requested is appropriate for RDT&E funding. Once that determination is made, the R&D Center prepares an R&D proposal that specifies anticipated work, milestones, and funding for a proposed project. A program office

¹As the contracting officer's technical representatives, project managers are responsible for monitoring a contractor's technical performance, comparing the contractor's progress with delivery schedules and cost objectives, and inspecting products provided by the contractor.

²In contrast, basic research involves working toward obtaining greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without considering specific applications to processes or products.

uses this information to develop a resource change proposal, which provides general information on a proposed RDT&E project, including project title, funding requested, and products to be developed. It typically takes 2 years from approval of a request for an RDT&E project to project funding.

Generally, about 25 areas of RDT&E activity coincide annually with program (e.g., search and rescue) or multimission (e.g., communications) activities. These areas of RDT&E activity involve about 80 projects, such as assessing possible search and rescue operational planning techniques and evaluating new and emerging communications technology. (See app. I for a listing of Coast Guard RDT&E projects funded during fiscal year 1993.)

Coast Guard Lacks Adequate Policies and Procedures for Selecting RDT&E Projects

The Coast Guard lacks adequate policies and procedures for selecting RDT&E projects. It does not have a clear definition of RDT&E to determine what types of projects should or should not be included in the RDT&E Program. Additionally, the Coast Guard lacks a long-range plan to help ensure that it selects projects that meet its most urgent needs.

The Coast Guard Does Not Have a Clear Definition of RDT&E

Prior to April 1992, the Coast Guard's RDT&E program instructions defined RDT&E as the systematic application of knowledge needed to obtain useful products, including the design and evolution of new products and the improvement of existing products. This broad definition allowed almost any activity to be classified as an RDT&E project. Coast Guard officials told us that, because the definition was broad, they relied on their judgment to decide which projects were appropriate for RDT&E funding. The range of projects funded included assessing available vessel search technology for locating contraband, investigating new developments in satellite and radio beacon technology for use as marine navigational aids, and developing measures of effectiveness for personnel activities.

During hearings on the Coast Guard's fiscal year 1993 budget, the Subcommittee on Transportation and Related Agencies, House Committee on Appropriations, questioned the agency's use of RDT&E funds to conduct certain activities, instead of funds from other Coast Guard appropriations accounts, such as Operating Expenses or Acquisition, Construction, and Improvements accounts. The purpose of one of the projects questioned was to determine the most cost-effective distribution of marine safety personnel.

In response to the congressional questioning, the Coast Guard issued interim guidelines in April 1992. These guidelines were to be used to develop the fiscal year 1994 RDT&E budget. The guidelines provided examples of the types of activities that could or could not be funded from the RDT&E appropriation account. For example, they allowed for the development, testing, and evaluation of technologies new to the Coast Guard but specified that testing and evaluation of technologies currently being used by the Coast Guard could not receive RDT&E funding. Using these guidelines, the Coast Guard deleted 15 projects from its proposed fiscal year 1994 RDT&E budget. These projects included developing a cost and financial model to assist in estimating acquisition costs for new ships and developing a management information system for the Search and Rescue Program. Four of the 15 projects were continuations of projects that earlier had been included in the fiscal year 1993 RDT&E budget and totaled \$1.1 million.

While the guidelines have proven to be helpful in eliminating some projects from the RDT&E budget, they are still very broad. They do not state what distinguishes a project as appropriate for RDT&E funding and whether activities such as management studies and strategic planning should be included as RDT&E projects. For example, the fiscal year 1992 RDT&E budget included \$350,000 for a project to conduct an occupational analysis of the Coast Guard's military enlisted grades. R&D Center personnel said that they were unsure whether the project would have been funded if the Coast Guard's interim RDT&E funding guidelines had been in effect when the fiscal year 1992 budget was developed. In our view, there is some question as to whether management studies and strategic planning should be considered appropriate RDT&E activities.

The lack of a clear definition of RDT&E has also allowed the Coast Guard to fund projects without prescribing the specific nature of the RDT&E support. For example, the Coast Guard plans to use \$4 million of the proposed fiscal year 1994 budget for RDT&E projects to support mission analysis and information resources management.³ The RDT&E Program Manager said that \$2.3 million of the funds were requested before a decision was made on how components of mission analysis and information resources management should be undertaken as RDT&E projects.

According to the RDT&E Program Manager, the Coast Guard was aware that its interim RDT&E guidelines did not completely satisfy the Congress's

³Mission analysis assesses the ability of the Coast Guard to successfully carry out a specific mission in the future. When deficiencies are identified, the agency uses the results of the analysis to prepare acquisition plans.

concerns. In April 1993, the agency revised its definition. He believes that the definition now clearly identifies the activities that should be funded. The definition states that research is a systematic study to increase scientific knowledge and understanding of a new technology or methodology. It further states that development is the systematic use of the knowledge and understanding gained from research directed toward the production of useful materials, devices, systems, or methods. In our view, this revised definition is still very broad. It does not clearly state what distinguishes a project as appropriate for RDT&E funding, nor does it give specific examples of the types of projects that are or are not appropriate for RDT&E. For example, it is still not clear whether such activities as management studies and strategic planning would be considered RDT&E projects under the revised definition. The Coast Guard RDT&E Program Manager said that each project would have to be evaluated on a case-by-case basis.

The Coast Guard Lacks an RDT&E Plan

The Coast Guard does not have an RDT&E plan that establishes long-range RDT&E priorities agencywide or that links proposed and ongoing RDT&E projects to the agency's missions. A long-range RDT&E plan would provide the mechanism to establish and evaluate priorities and specify how the RDT&E program would support the agency's missions. Such a plan would help to ensure that proposed and ongoing RDT&E projects logically support the agency's missions and goals.

The Manager of the RDT&E Program agreed that a component missing in the RDT&E project selection process is a strategic, long-range view of RDT&E that establishes areas of priority for RDT&E. He stated that almost all of the programs want some RDT&E support. Consequently, without the benefit of a strategic, agencywide RDT&E plan, the Coast Guard attempts to consider the priorities of each program and to distribute RDT&E resources accordingly. (See app. II for RDT&E Program funding by Coast Guard mission for fiscal years 1991-94.) Using historical RDT&E funding levels as a guide, individual program managers annually develop a priority ranking of the RDT&E projects they want initiated and/or continued for their respective programs. The R&D Staff merges each program's list of priority projects into a draft list of projects that is sent to the Coast Guard's Project Development Board, which includes senior Coast Guard management.

Established in 1989, the Board's primary purpose is to manage the development of the proposed RDT&E budget. It produces a list representing the consensus of the Board's members on the RDT&E projects to be funded

and the amount of funding for each project at various funding levels (e.g., \$40 million, \$35 million, \$30 million), depending on the total RDT&E budget. Should the expected funding level be reduced, the Coast Guard will, accordingly, eliminate some projects from the budget request or scale back the tasks to be performed under various projects. However, all programs are likely to receive some RDT&E support. This process essentially promotes funding the greatest number of projects rather than only those that should receive priority funding. As budget resources become scarcer, it will become more difficult to be selective in funding certain projects and to ensure the appropriate allocation of resources without having established priorities in advance.

The Coast Guard Does Not Have Key Management Tools to Effectively Manage Its R&D Center

The Coast Guard lacks certain key management tools that, in our view, are necessary to effectively manage the R&D Center. Specifically, the Coast Guard does not have an adequate management information system to track the performance of projects or an evaluation process to measure the impact of RDT&E efforts on Coast Guard programs.

The R&D Center Lacks an Adequate Management Information System

The R&D Center lacks an adequate management information system that readily provides key information—such as the status of planned expenditures for a particular project or a project's milestones—to R&D managers. Managers need accurate, complete, and timely information for decision-making and program monitoring. While some of this information exists at the R&D Center, it is in paper form, scattered among several documents, and not easily retrieved or analyzed.

RDT&E Program officials recognize the need for an R&D management information system but have not been successful in obtaining funding for it. While the RDT&E Program did not conduct a cost-benefit analysis of an R&D management information system for the Center, an RDT&E Program official estimates that the system would cost approximately \$500,000. The Coast Guard's proposed RDT&E budget for fiscal years 1993 and 1994 included requests for funds to develop an R&D management information system. However, during the internal budget review process for those 2 fiscal years, the Coast Guard removed these funding requests because either it needed to fund a higher RDT&E priority or it was directed to do so by the Office of the Secretary of Transportation's budget office. According to an official in the Secretary's budget office, the R&D management information system was eliminated because his office was concerned

about the ability of the agency to manage the large number of new information systems it was planning to implement.

Notwithstanding the difficulties in getting funding for a management information system, the R&D Center is establishing what is described as a "band-aid" management information system. This automated system contains such project information as project titles, start and completion dates, milestones, and products to be produced. The information comes from the Center's project planning documents and is to be used by the Center's senior managers to monitor project performance.

The system is limited, however, because it does not provide all of the information necessary to adequately manage the R&D Center. For example, it does not link project planning information with actual results, such as the status of project expenditures, products delivered, and staff time charged. Hard copies of information from the management information system and information from the Center's financial system, which are produced separately, have to be merged manually for management oversight. According to management officials at the Center, additional staff time is therefore needed to prepare documents, and data may be omitted.

The R&D Center Does Not Evaluate the Results of Its RDT&E Projects

The R&D Center does not have procedures to evaluate or measure the impact of its RDT&E projects on Coast Guard operations. For example, a major thrust of RDT&E projects for the Search and Rescue Program is to identify technology that would reduce the amount of search effort involved in search and rescue activities. However, RDT&E personnel could not provide quantifiable data on the results of RDT&E projects, such as the amount of search time saved as a result of an RDT&E project. Such evaluation would provide sound information about what projects are actually delivering, how well they are being managed, and how effective or cost-efficient they are. Without evaluating the impact of RDT&E projects, the Center's management cannot be assured that the RDT&E projects provide effective, cost-efficient, and useful products.

R&D Center officials agreed that they needed to develop measures to assess the effectiveness of the Center's RDT&E efforts. They stated, however, that they initially focused their efforts on improving the Center's operating processes. The Center's commanding officer said that he expects the R&D Center to begin measuring the effectiveness of its projects in fiscal year 1994.

Conclusions

The Coast Guard lacks adequate policies and procedures to help it select RDT&E projects. Specifically, the definition of RDT&E is not clear and comprehensive enough to help the agency select projects and to ensure that it is making the best use of its resources. The Coast Guard also does not have a long-range RDT&E plan that identifies the agency's goals and mission priorities and links planned and ongoing projects to those goals and priorities. A long-range plan would help the Coast Guard better ensure that it is initiating and continuing its most important RDT&E projects and allocating the appropriate resources to these projects.

Additionally, the Coast Guard has not established, for its R&D Center, an information system or evaluation activities to identify and address critical management needs and problems. For example, the Coast Guard needs a management information system to link planning, performance, and financial information on projects and to assist the Center in monitoring all phases of projects and in making adjustments as needed. While RDT&E officials recognize the need to acquire a management information system for the Center, they need to develop data to better support this acquisition, given scarce RDT&E resources. The Center also needs to focus its attention on implementing an evaluation process to help it quantifiably measure the impact of its RDT&E efforts on Coast Guard operations. This evaluation process would help the Center ensure that Coast Guard RDT&E projects are adequately addressing programs' needs and problems.

Recommendations

We recommend that the Secretary of Transportation direct the Commandant of the Coast Guard to

- revise the Coast Guard's definition of RDT&E to ensure that it clearly distinguishes the types of projects that are appropriately RDT&E to assist Coast Guard managers in selecting RDT&E projects;
- establish a long-range plan that identifies the Coast Guard's RDT&E goals and mission priorities;
- continue the agency's efforts to acquire for the R&D Center a management information system that is cost-beneficial and that will provide accurate, complete, and timely information for decision-making and program monitoring; and
- establish procedures to evaluate or measure the impact of RDT&E projects on Coast Guard operations.

Agency Comments

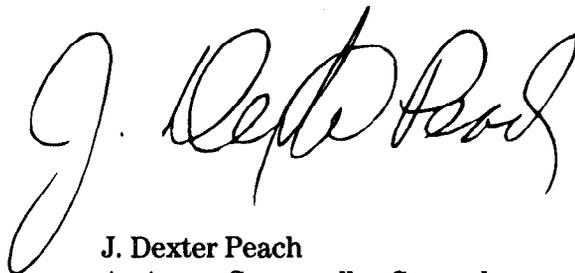
We discussed the facts, conclusions, and recommendations in this report with the Manager of the RDT&E Program and the Technical Director of the R&D Center. They generally agreed with our analysis, stating that we had correctly identified problems in the RDT&E Program. However, they disagreed with our finding of the need to clarify the agency's definition of RDT&E. They also provided some specific suggestions for clarification. Their comments have been incorporated where appropriate. With regard to the agency's definition of RDT&E, we continue to believe that the definition does not clearly state the characteristics that distinguish a project as appropriate for RDT&E funding, nor does it give specific examples of the types of projects that are or are not appropriately RDT&E. As requested, we did not obtain written agency comments on a draft of this report.

Our review was conducted between June 1992 and March 1993 in accordance with generally accepted government auditing standards. Appendix III discusses our scope and methodology in detail.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Secretary of Transportation; the Commandant of the Coast Guard; and the Director, Office of Management and Budget. We will also make copies available to others on request.

This work was performed under the direction of Kenneth M. Mead, Director of Transportation Issues, who can be reached at (202) 512-2834 if you or your staff have any questions. Other major contributors to this report are listed in appendix IV.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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Abbreviations

GAO	General Accounting Office
GPS	Global Positioning System
R&D	research and development
RDT&E	research, development, test and evaluation

Coast Guard Research, Development, Test and Evaluation Projects Funded in Fiscal Year 1993, by Program Area

Program area and programs	Project	Appropriation
Search and Rescue		\$1,450,000
Improved Search and Rescue Capabilities	<ul style="list-style-type: none"> • Search and Rescue Operations Planning • Post-Search and Rescue Mission Analysis and Documentation • Evaluation of Search and Rescue Platforms and Sensors 	
Aids to Navigation		\$1,235,000
Advanced Global Positioning System (GPS) Development	<ul style="list-style-type: none"> • Continuation of GPS Technology Studies Primarily Concerning Selective Availability • Differential GPS Reference Station Monitor Development • Differential GPS Prototype Development and Evaluation • United States-Wide Differential GPS Design • Radio Beacon Broadcast Communications, Control, and Facility Development 	
Short-Range Aids to Navigation Research	<ul style="list-style-type: none"> • Signal Platform Research • Signal and Payload Development: Design and Development • Signal Effectiveness 	
Integrated Navigation Systems	<ul style="list-style-type: none"> • United States Electronic Chart Display Information System Testbed and Demonstration 	
Vessel Traffic Service/Systems	<ul style="list-style-type: none"> • Human Factors Analysis Engineering • Vessel Traffic System Technology Update 	
Marine Safety		\$1,530,000
Marine Safety Research	<ul style="list-style-type: none"> • Naval Architecture, Stability, Structures • Human Factors Analysis • Marine Inspection/ Inspector Support • Operations Research/ Analysis for Marine Safety 	
Improve Fire Safety for Commercial Vessels	<ul style="list-style-type: none"> • Smoke Control-Passenger Vessel • Fire Resistance of Divisions 	

(continued)

**Appendix I
Coast Guard Research, Development, Test
and Evaluation Projects Funded in Fiscal
Year 1993, by Program Area**

Program area and programs	Project	Appropriation
Support for the Interagency Ship Structure Committee	<ul style="list-style-type: none"> • Role of Human Error in the Design, Construction, and Reliability of Marine Structures • Improving Fatigue Behavior of Ship Structural Details • Maintenance of Marine Structures: State-of-the Art Summary • Probability-Based Ship Design (Phase 3 of 4) Implementation of Design Guidelines • Evaluation of Ductile Fracture Models for Fracture Behavior of Ship Structural Details • Nonlinear Time Domain Simulation of Wave Loads • Extreme Waves and Wave Impact Forces Evaluation • New Methods for Retaining Weld Properties over the Range of Fabrication Conditions 	
Marine Environmental Protection		\$4,665,000
Marine Environmental Protection/ Pollution Response	<ul style="list-style-type: none"> • Spill Planning and Management • Oil Spill Recovery Systems Research, Development, Test and Evaluation • Alternative Countermeasures • Narragansett Bay Vessel Traffic System Demonstration • Oil Pollution Act of 1990 Level-I Prevention Initiatives • Oil Pollution Act of 1990 Level-I Response Initiatives 	
Oil Pollution Act of 1990 Level II Initiatives	<ul style="list-style-type: none"> • Spill Prevention • Minimum Manning Standards • Improved Methods for Tank Vessel Inspection • Waterways Traffic Management • Risk and Related Analysis in Marine Safety • Licensing Requirements for Automated Ship • Personnel Resource Management Methods 	

(continued)

**Appendix I
Coast Guard Research, Development, Test
and Evaluation Projects Funded in Fiscal
Year 1993, by Program Area**

Program area and programs	Project	Appropriation
	<ul style="list-style-type: none"> • Spill Response Innovative Oil/Water Separation Techniques Improved Temporary Storage of Oil Salvage: Improved Product Offloading at Sea Vessel of Opportunity Skimming System: Test and Evaluation Airborne Surveillance Systems Development • National Strike Force Systems Configuration Study and Model 	
Oil Pollution Act of 1990 Regional Grant Program	• Grants Program	
Enforcement of Laws and Treaties		\$1,300,000
Comprehensive Law Enforcement Capabilities Improvements	<ul style="list-style-type: none"> • Technology for Surveillance • Technology for Vessel Search 	
Mission Capabilities Assessment		\$860,000
Coast Guard Cutter Fire Safety Technology	<ul style="list-style-type: none"> • Ship Fire Safety Engineering Method • Small Cutter Fire Protection • Fixed Halon System Alternatives 	
Engineering Support	<ul style="list-style-type: none"> • Machinery Plant Control and Monitoring System: System/Software Management • Machinery Plant Control and Monitoring System Data Management System Development • Aircraft Corrosion Studies 	
Coast Guard Vessel Loss Exposure and Risk Analysis Method	• Define Coast Guard Vessel Hazards	
Multimission		\$5,630,000
Increased Human Resources Management Effectiveness	<ul style="list-style-type: none"> • Military Work Force Model • Manpower, Personnel, and Training Aspects of Major Acquisitions • Coast Guard Staffing Standards 	
Advanced Communication Technologies	<ul style="list-style-type: none"> • Technology Assessment • Shipboard Communications Centers Modernization 	

(continued)

**Appendix I
Coast Guard Research, Development, Test
and Evaluation Projects Funded in Fiscal
Year 1993, by Program Area**

Program area and programs	Project	Appropriation
Decision Support Systems	<ul style="list-style-type: none"> • Decision Support for Tactical Applications 	
Model Development for Coast Guard Operational Programs	<ul style="list-style-type: none"> • Fleet Mix Planning • Coast Guard Mission Models • Platform Scheduling Support System • Resource Employment 	
Information Resource Management Mission System Planning, Analysis and Design	<ul style="list-style-type: none"> • Operations Information System • Support Information System • Operations Management Information System • System for Automated, Integrated Logistics • Computer-Aided Search Planning 	
Service-Wide Hazardous Materials Minimization	<ul style="list-style-type: none"> • Hazardous Materials Audit and Alternative Analysis 	
Select Program Research and Development	<ul style="list-style-type: none"> • Select Projects 	
Congressional additions		\$1,940,000
	<ul style="list-style-type: none"> • South Florida Oil Spill Research Center • Study of V-22 Aircraft • Test of Double Hull Oil Tanker Alternatives • Maritime Fire and Safety Association • New Jersey Marine Sciences Consortium 	

Source: U.S. Coast Guard.

Research, Development, Test and Evaluation Program Funding by Coast Guard Mission, Fiscal Years 1991-94

Dollars in thousands

Missions	Mission Funding							
	Fiscal year 1991		Fiscal year 1992		Fiscal year 1993 ^a		Fiscal year 1994 ^a	
	Funding	Percent of total	Funding	Percent of total	Funding	Percent of total	Funding	Percent of total
Search and Rescue	\$5,890	24	\$4,161	14	\$3,425	12	\$2,991	12
Aids to Navigation	5,200	21	4,036	14	4,287	15	4,650	19
Marine Safety	1,907	8	3,649	13	3,847	14	4,846	19
Marine Environmental Protection	4,200	17	6,626	23	8,229	30	4,651	19
Enforcement of Laws and Treaties	5,900	24	7,539	26	6,733	24	6,557	26
Ice Operations	644	3	547	2	510	2	512	2
Defense Readiness	1,259	5	2,592	9	784	3	793	3
Total	\$25,000	100	\$29,150	100	\$27,815	100	\$25,000	100

^aEstimate.

Source: GAO analysis of Coast Guard data.

Note: Percentages may not add to 100 due to rounding.

Scope and Methodology

We interviewed Coast Guard Research, Development, Test and Evaluation (RDT&E) Program officials at Coast Guard headquarters in Washington, D.C., and at the agency's Research and Development (R&D) Center in Groton, Connecticut, to determine the Coast Guard's policies and procedures for selecting RDT&E projects. We also interviewed the managers of the Coast Guard's Operational Law Enforcement, Radionavigation, Search and Rescue, Short-Range Aids to Navigation, and Vessel Traffic Service Programs and the R&D program coordinator for the Office of Marine Safety, Security, and Environmental Protection in Washington, D.C., to obtain information on how they identify and set priorities for their RDT&E needs. Additionally, we reviewed the Coast Guard's RDT&E Program instructions and the interim RDT&E funding guidelines established by the Coast Guard and analyzed internal Coast Guard files, operating and budget documents, and internal correspondence. Furthermore, we reviewed the Coast Guard's RDT&E budget submissions for fiscal years 1991-94.

To obtain information on the tools used by the Coast Guard to manage its R&D Center, we visited the Center and interviewed senior level management of the Center. We also obtained and analyzed the most recent edition of the R&D Center's Project Management Handbook and its proposed changes to the Handbook. Furthermore, we obtained and reviewed organizational analyses of the R&D Center developed by a consulting firm in 1989 and 1992 and the Center's draft April 1992 strategic plan.

Finally, to address our objectives concerning RDT&E project selection and management of the R&D Center, we obtained and reviewed the two most recent reports on the Coast Guard's RDT&E Program prepared by the Department of Transportation's Office of Inspector General in 1988 and 1993.¹

¹Report on Audit of Research, Development, Test and Evaluation Program, United States Coast Guard, (Report Number: AV-CG-8-008, Jan. 7, 1988) and Report on Audit of Management of Research Projects, United States Coast Guard, Research and Development Center (Report Number: R2-CG-3-028, Jan. 21, 1993).

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