United States General Accounting Office

GAO

Performance and Accountability Series

January 2003

Major Management Challenges and Program Risks

Environmental Protection Agency

GAO

Accountability ★ Integrity ★ Reliability

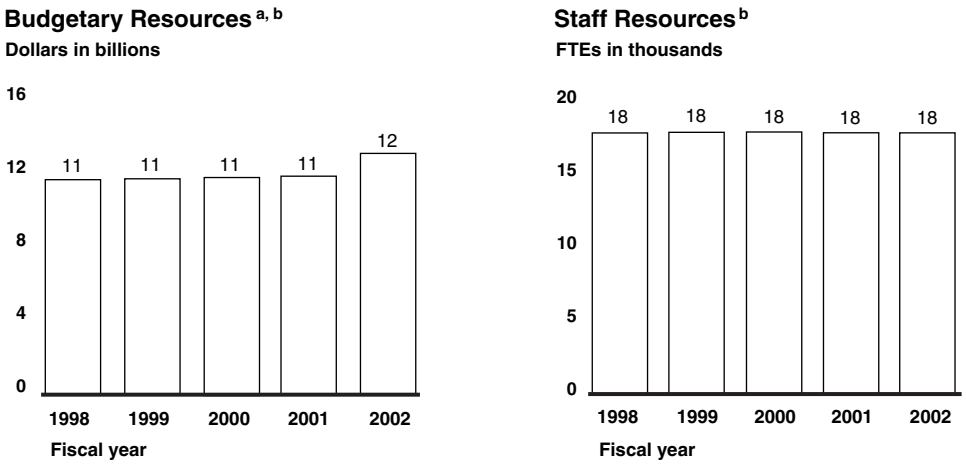
GAO-03-112

A Glance at the Agency Covered in This Report

The Environmental Protection Agency has the critical and complex mission of protecting human health and safeguarding the environment. It works collaboratively with the states, local governments, tribes, and others on a variety of efforts, including ensuring that

- the air in every American community will be safe and healthy to breathe;
- all Americans will have drinking water that is clean and safe to drink;
- America's rivers, lakes, wetlands, aquifers, and coastal and ocean waters will be protected;
- the foods Americans eat will be free from unsafe pesticide residues;
- America's wastes will be stored, treated, and disposed of in ways that prevent harm to people and the natural environment; and
- the United States will lead other nations in reducing significant risks from climate change, stratospheric ozone depletion, and other hazards of international concern.

The Environmental Protection Agency's Budgetary and Staff Resources



Source: Budget of the United States Government.

[a] Budgetary resources include new budget authority (BA) and unobligated balances of previous BA.

[b] Budget and staff resources are actuals for FY 1998-2001. FY 2002 are estimates from the FY 2003 budget, which are the latest publicly available figures on a consistent basis as of January 2003. Actuals for FY 2002 will be contained in the President's FY 2004 budget to be released in February 2003.

This Series

This report is part of a special GAO series, first issued in 1999 and updated in 2001, entitled the *Performance and Accountability Series: Major Management Challenges and Program Risks.* The 2003 Performance and Accountability Series contains separate reports covering each cabinet department, most major independent agencies, and the U.S. Postal Service. The series also includes a governmentwide perspective on transforming the way the government does business in order to meet 21st century challenges and address long-term fiscal needs. The companion 2003 *High-Risk Series: An Update* identifies areas at high risk due to either their greater vulnerabilities to waste, fraud, abuse, and mismanagement or major challenges associated with their economy, efficiency, or effectiveness. A list of all of the reports in this series is included at the end of this report.

January 2003

PERFORMANCE AND ACCOUNTABILITY SERIES

Environmental Protection Agency

GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-03-112, a report to Congress included as part of GAO's Performance and Accountability Series

Why GAO Did This Report

In its 2001 performance and accountability report on the Environmental Protection Agency (EPA), GAO identified important challenges facing the agency in improving environmental information, developing a comprehensive human capital approach, and strengthening working relationships with the states. The information GAO presents in this report is intended to help to sustain congressional attention and an agency focus on continuing to make progress in addressing these challenges—and others that have arisen since 2001—and ultimately overcoming them. This report is part of a special series of reports on governmentwide and agency-specific issues.

What Remains to Be Done

GAO believes that EPA should:

- Ensure that recent steps to improve environmental information receive sustained top management support.
- Implement a systematic and comprehensive human capital approach.
- Articulate a clear and specific endorsement of legislation that would address statutory obstacles to the agency's regulatory reinvention efforts.
- Strengthen its grants planning and management to better achieve environmental results.
- Improve its internal controls over financial reporting.

www.gao.gov/cgi-bin/getrpt?GAO-03-112.

To view the full report, click on the link above. For more information, contact Robert A. Robinson, at (202) 512-3841 or robinsonr@gao.gov.

What GAO Found

The Environmental Protection Agency has made progress toward resolving the specific performance and management challenges that GAO previously identified. However, each of these challenges requires more work and vigilance to be overcome. In addition, the agency must face emerging challenges in managing grant resources to better achieve environmental results and in correcting weaknesses in controls over its financial reporting.

- **Improving environmental information.** EPA has taken important steps to improve the environmental information it uses to set priorities and measure progress. For example, EPA has embarked on a major effort to determine the overall status of the nation's environment. EPA has also taken steps to improve the compatibility and security of its data systems. However, EPA must work to further improve its environmental information, fill significant data gaps, and incorporate better scientific understanding into its performance measures.

- **Strengthening human capital management.** EPA has conducted a study of its workforce and issued a human capital strategy. However, the agency still must determine the number of employees it needs to accomplish its mission, the technical skills required, and how best to allocate employees among EPA's strategic goals and geographic locations. Similarly, EPA needs to fully prepare for the loss of leadership, institutional knowledge, and scientific expertise that will likely result from upcoming retirements.

- **Making regulatory innovation successful.** EPA has invested considerable time and resources in a variety of initiatives to encourage more effective and cost-efficient environmental protection. However, these initiatives have yielded limited results. Our work shows that current environmental statutes significantly impede regulatory innovation. If the statutory obstacles to innovation are not addressed, EPA's future regulatory initiatives may not fare better than past ones.

- **Improving grants planning and management.** EPA annually spends over half its budget on grants. However, the agency has often not focused its planning and performance measurement for grants on achieving environmental results. In addition, EPA must address persistent problems in its management and oversight of grants.

- **Strengthening controls over financial reporting.** EPA's Inspector General issued an unqualified opinion on EPA's consolidated financial statements for fiscal year 2001. However, the Inspector General identified several internal control weaknesses that EPA needs to address to improve its ability to process, summarize, and report financial data.

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Comptroller General
of the United States

United States General Accounting Office
Washington, D.C. 20548

January 2003

The President of the Senate and the
Speaker of the House of Representatives

This report addresses the major management challenges and program risks facing the Environmental Protection Agency (EPA) as it works to carry out its complex mission of protecting human health and safeguarding the environment. The report discusses the actions that EPA has taken and that are under way to address the challenges GAO identified in its Performance and Accountability Series 2 years ago. The report also summarizes the challenges that remain, new ones that have emerged, and further actions that GAO believes are needed.

This analysis should help the new Congress and the administration carry out their responsibilities and improve government for the benefit of the American people. For additional information about this report, please contact Robert A. Robinson, Managing Director, Natural Resources and Environment, at (202) 512-3841 or at robinsonr@gao.gov.

David M. Walker
Comptroller General
of the United States

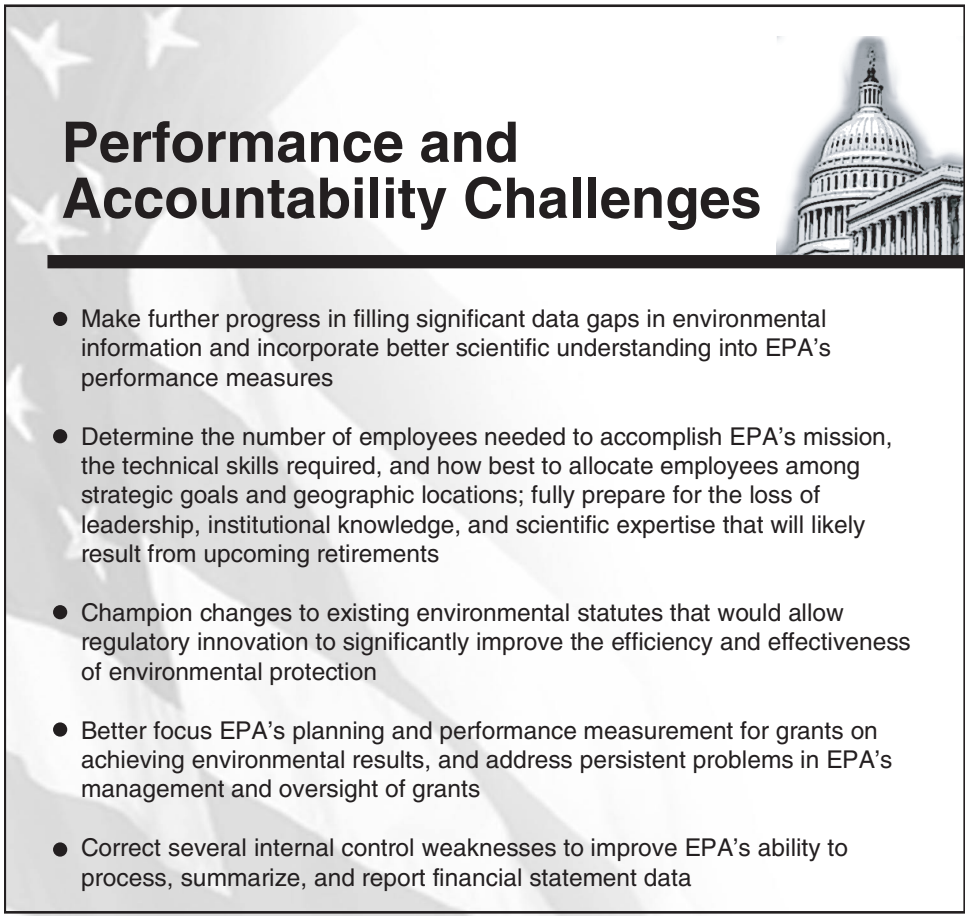
Major Performance and Accountability Challenges

In January 2001 we reported that EPA faced three performance and accountability challenges in fulfilling its mission of protecting human health and the environment. First, EPA needed to improve its environmental and performance information management to set priorities and measure results. Without a comprehensive picture of environmental conditions, EPA faces difficulty in setting risk-based priorities for its programs, evaluating performance progress and environmental results, and reporting on its accomplishments. Second, EPA needed to place greater emphasis on developing a comprehensive human capital program. Without such a program, EPA faces difficulty in aligning human capital investments with strategic goals and objectives, and determining the number of employees, the skills, and the deployment of its workforce needed to accomplish its mission. Finally, we reported that the nation's complex future environmental challenges require EPA and its stakeholders to adopt fundamentally different regulatory approaches that are more flexible and less administratively burdensome.

During the past 2 years, EPA has continued its traditional efforts to protect the nation's air, land, water, and human health, while undertaking new roles and responsibilities, such as mitigating the environmental effects of the tragic events of 2001. EPA played a major role in responding to the attacks at the World Trade Center, assisting in debris removal, air and water quality monitoring, worker protection, dust cleanup, and criminal investigation. Similarly, EPA worked with the Federal Bureau of Investigation and the Department of Defense at the Pentagon crash site to monitor air and drinking water quality and to collect forensic evidence for criminal investigation. EPA also provided personnel, equipment, and contractors to help assess or clean up anthrax contamination at the U.S. Postal Service, the Capitol Hill complex, and other government sites. Despite its increased responsibilities, EPA has, to its credit, also undertaken some major initiatives to improve the overall management of the agency and its resources.

These management initiatives have helped EPA make progress in addressing the management challenges we identified in our 2001 report. For example, in an effort to improve the quality of the information used to set priorities and measure results, EPA plans to issue the first-ever *State of the Environment Report* in early 2003, which will summarize available information on the condition of the nation's environment and identify the remaining information needed to complete the picture. In addressing its human capital challenges, EPA has begun to develop a workforce assessment system that will identify the technical skills and

number and type of positions required, inventory the skills of the current workforce, examine attrition rates, and forecast the number of new hires required. Finally, in an effort to adopt regulatory approaches that are more flexible and less administratively burdensome, EPA has invested considerable time and resources in a variety of initiatives to encourage more effective and cost-efficient ways of protecting the environment. However, for each of the management challenges we identified in 2001, more work remains to be done. In addition, we have identified two other challenges that EPA needs to address. Specifically, EPA needs to strengthen its grants management and improve internal controls over its financial management reporting. In sum, the major management challenges that EPA faces are as follows:



EPA Needs to Ensure That Recent Steps to Improve Environmental Information Receive Sustained Top Management Support

Information is critical to EPA's mission of protecting the environment and public health. Information from scientific research, from the monitoring of air and water quality and other environmental parameters, and from epidemiological and other studies of the links between environmental pollutants and human health effects is needed to inform EPA's policies and to assess the effectiveness of the agency's policies and programs in achieving desired results. While the quality of environmental information and the scientific understanding of how environmental factors can affect ecological conditions and human health have improved since EPA's inception, the pace of progress has sometimes been slow. Furthermore, significant gaps in environmental information and scientific knowledge remain. EPA has taken a number of recent actions to implement recommendations that we and others have made to enhance the quality and usefulness of the environmental information that it and its partners generate. These actions include adopting an information strategic plan that envisions managing information as a strategic resource, developing data standards to facilitate efficient reporting, aggregating and integrating environmental data, measures to improve information security, and initiatives to develop a comprehensive set of environmental indicators and use them to provide the public with a baseline report on the current state of the environment.

To ensure that these and related actions continue and achieve the desired results, EPA management needs to develop annual or multiyear action plans to translate the "vision" embodied in the strategic information plan into specific actions that will advance the achievement of the plan's goals. Action plans would, among other things, establish target dates for completing specific actions and identifying the resources required to meet these milestones. Action plans could help ensure that the strategic plan becomes and remains a living document that informs agency decision making; guides investments in information infrastructure, technology, and human capital; and evolves over time to reflect progress, changing circumstances, and new imperatives. Sustained progress in enhancing the agency's information management will require a long-term commitment of management attention, including appropriate follow-through and resource support.

Significant Gaps Remain in Environmental Data and Science

The results of scientific research, and the information and knowledge gained from monitoring the environment and public health, are essential foundations for developing; assessing; and refining environmental policy, including developing measures to gauge the effectiveness of that policy in producing the desired outcomes. While EPA, the states, and other environmental partners carry out a considerable amount of research and collect extensive information on environmental parameters, significant gaps and weaknesses remain in the knowledge and understanding of environmental stressors and pollutants and their effects on ecological condition and human health. Information obtained from environmental monitoring is often fragmentary and of varying quality, information on human exposures to toxic pollutants is limited, and the ecological and public health effects of many environmental contaminants are still not well understood. As we have reported in the past, such gaps in the data and in scientific understanding hamper EPA's efforts to (1) perform critical human exposure and risk assessments, (2) use risk as a basis for setting program priorities, (3) obtain a comprehensive understanding of environmental conditions and changes over time, and (4) assess the agency's effectiveness in carrying out its mission of protecting the environment and human health.

Information on the health risk posed by exposures to toxic chemicals is critical to EPA's policy decision making. However, the information needed to credibly assess these risks often does not exist. In a May 2000 report on the lack of data regarding human exposures to toxic chemicals in the environment, we reported that exposure data were limited because the data were being collected nationwide for only a small percentage of the nearly 1,500 potentially harmful chemicals we reviewed.[1] For the nearly 500 chemicals that EPA identified as most in need of testing under the Toxic Substances Control Act, only 2 percent were being tested for human exposure. We recommended that the Secretary of Health and Human Services and the EPA Administrator develop a coordinated federal strategy for the monitoring and reporting of human exposures to potentially toxic chemicals.

Progress in this area has been slow, however, and the benefits of initiatives currently in the discussion or planning stages are likely to be years away from realization. For example, EPA's Office of Research and Development

[1] See U.S. General Accounting Office, *Toxic Chemicals: Long-Term Coordinated Strategy Needed to Measure Exposures in Humans*, GAO/HEHS-00-80 (Washington, D.C.: May 2, 2000).

is moving to establish a program addressing environmental public health outcomes as part of its Human Health Research Strategy. This Office recently held a workshop involving several public health agencies to help in developing a research framework that would be complementary to other agencies' efforts and define opportunities for collaboration. Also, according to officials of EPA's Office of Environmental Information, that Office worked with the Centers for Disease Control and Prevention in 2002 on a potential cross-agency initiative to develop and link environmental and human health information resources, specifically the Centers' National Environmental Public Health Tracking Program network and EPA's National Environmental Information Exchange Network. The proposed linkage holds the potential to enhance information technology tools to foster the analysis and dissemination of information obtained to a variety of audiences.

Important data gaps also remain in EPA's Integrated Risk Information System, a database containing information on human health effects that may result from exposure to chemicals in the environment. Specifically, the database contains no basic data on the toxicity of about two-thirds of the known hazardous air pollutants and only limited information on the ecological effects of environmental pollutants. Likewise, there are significant data gaps and weaknesses in EPA's National Water Quality Inventory, the primary report on the condition of the nation's waters. The gaps result from the fact that only a small percentage of U.S. waters is assessed for quality and only a limited number of assessments are based on current, site-specific monitoring information.[2] Incomplete water quality data make it difficult for EPA to accurately describe the condition of the nation's waters and report on the progress being made toward achieving established water quality goals. The data gaps and weaknesses are also problematic because agency officials rely on state-reported data in the inventory when making program management decisions, including determining how certain Clean Water Act funds will be allocated among the states.

[2] Pursuant to section 305(b) of the Clean Water Act, states report biennially to EPA on the quality of their waters. EPA summarizes this information in a biennial report, the *National Water Quality Inventory.* The most recent such report is the report for 2000. For that report, states assessed only 19 percent of the nation's river and stream miles; 43 percent of its total acres of lakes, ponds, and reservoirs; 36 percent of its square miles of estuaries; and 6 percent of its ocean shoreline miles. Furthermore, as we reported in March 2000, on the basis of our survey of 50 states and the District of Columbia, only 3 states indicated that they had the majority of the data needed to identify and assess nonpoint sources of pollution, generally considered to be the greatest contributor to water quality impairment at present.

EPA's research on the use of biological indicators for environmental assessments demonstrates the importance and value of research. Because site-specific water quality monitoring is complex, difficult, and expensive, for many contaminants (including sediment, toxic chemicals, pathogens, and invasive species) that are potentially of concern, it is doubtful that many states, territories, and tribes will ever be able or willing to devote sufficient resources to monitor their streams and other water bodies adequately and on a regular basis. Recognizing this, EPA has conducted research on alternative methodologies for estimating the environmental conditions of streams, estuaries, and other water bodies. EPA's Environmental Monitoring and Assessment Program (EMAP) has conducted studies that have established that the use of biological indicators that integrate chemistry, habitat, pathogens, and other stressors over time lead to less expensive approaches to monitoring the environmental conditions in streams and other water bodies. According to EPA, as of May 2002, 20 states had adopted a methodology based on EMAP to determine the environmental condition of steams and estuaries on a regional scale. In addition, the agency reports that it has several initiatives under way for the greater application of this approach to coastal areas and streams in arid areas of the West and for assessing the nation's great rivers.

In November 2001, at the direction of its Administrator, EPA embarked on a major effort that holds the promise of providing, for the first time ever, an overall picture—albeit less than perfect and complete—of the nation's current environmental conditions and trends and, equally important, of highlighting data gaps and indicating the research and information collection efforts needed to fill those gaps. The Administrator directed EPA's Office of Environmental Information and Office of Research and Development to lead an agencywide initiative to develop a set of indicators of environmental quality and use these indicators as a basis for drafting the *State of the Environment Report* to be issued in early 2003. The report is intended to serve as the basis for initiating a broad public discussion about the environment and environmental protection. As currently envisioned, it will (1) describe current environmental conditions and trends using existing data and indicators developed by EPA and others, (2) identify data gaps and research needs, (3) discuss challenges that government and other environmental partners face in filling those gaps and needs, and (4) be accompanied by extensive technical information and support. The report is to encompass five environmental theme areas: human health, ecological condition, clean air, pure water, and better protected land. Under human health, for example, the report will explore

trends in diseases, human exposure to environmental pollutants, and diseases thought to be related to environmental pollution.

EPA views the draft *State of the Environment Report* as the starting point of a public dialogue on environmental protection issues and an important step toward a more comprehensive approach to identifying priorities, focusing resources on areas of greatest concern, and managing its work to achieve measurable results. If successful in its aims, this multiyear undertaking could make a substantial contribution not only to identifying and filling research and data gaps but also to measuring progress within an overall framework of ecological and human health, assisting EPA's strategic-planning efforts, and facilitating a transition to performance-based management driven by environmental goals. To be successful, however, particularly in identifying and filling research and data gaps, this effort will require sustained cooperation and coordination on the part of EPA, other federal and state partners, academic institutions, and others. It will also require adequate and dependable financing, something that many people—including advocates of strong environmental science in the Congress—may argue has been absent until now.

EPA Has Made Progress in Overcoming Data System Weaknesses That Limit the Usefulness of Environmental Data, but More Needs to Be Done

We reported in January 2001 that EPA's data management system is outmoded in numerous respects, including having separately designed, media-specific databases that are generally not technically compatible.[3] This incompatibility is a legacy of the historical "stove-pipe," or single media, orientation of EPA's programs and has served as a barrier to the efficient reporting, aggregation, and integration of data to present comprehensive information on pollutants, industrial sectors, localities, and environmental conditions and trends. Despite this historical legacy, however, EPA has recognized the importance of integrated environmental information and the need to make its databases compatible with one another and with those of its state and tribal partners. For example, since our January 2001 report, the agency has made notable progress in implementing an initiative to standardize basic data element definitions and formats to permit the information contained in EPA and state and tribal databases to be combined to present a more comprehensive picture of environmental conditions and results. Agency officials also view data standardization as a way to reduce the reporting burden for states and

[3] See U.S. General Accounting Office, *Major Management Challenges and Program Risks: Environmental Protection Agency*, GAO-01-257 (Washington, D.C.: January 2001).

industry by allowing more integrated data reporting and facilitating electronic reporting via the Internet.

Implementing a recommendation that we made in a September 1999 report, that the agency coordinate its data standardization efforts with the states, federal agencies, and other organizations, EPA and its state and tribal partners created the Environmental Data Standards Council to work cooperatively to develop consensus-based data standards.[4] To date, EPA and its partners on the Council have adopted and begun to implement seven final data standards that will foster consistently defined and formatted data elements and sets of data values and facilitate public access to more meaningful data. The data standards that have been finalized are

- the date,
- the latitude/longitude,
- biological taxonomy,[5]
- chemical identification,
- facility identification,
- permitting, and
- the Standard Industrial Classification/North American Industrial Classification System.

As an example of the function and value of such data standards, the "chemical identification" standard provides a consistent way to identify and represent chemical substances across the agency. It provides EPA with a unique, unambiguous, common name for each chemical substance and chemical grouping in which the agency has an interest, and provides a way to reference data about chemical substances across EPA systems and to search for chemical entries in these systems. By the same token,

[4] See U.S. General Accounting Office, *Environmental Information: EPA Is Taking Steps to Improve Information Management, but Challenges Remain*, GAO/RCED-99-261 (Washington, D.C.: Sept. 17, 1999).

[5] This standard refers to the classification of biological organisms in established categories, such as kingdom, phylum, class, order, family, genus, species, and subspecies.

the "facility identification" data standard provides, for the first time, a unique facility identification number for any facility subject to EPA's regulatory authority, regardless of the media program(s) involved. Achieving consensus even on such a seemingly simple and straightforward matter was by no means an easy task. EPA officials told us that it was necessary to overcome broad resistance stemming from concerns about "big brotherism."

In addition to these final standards, a number of new standards are currently under development or envisioned by the Council and EPA action teams. These standards include

- contact,
- enforcement/compliance,
- tribal identifiers,
- reporting water quality results for chemical and microbiological analytes,
- geospatial referencing,
- the electronic reporting of environmental laboratory results,
- federal facilities identifiers, and
- the National Pollutant Discharge Elimination System (NPDES).

The NPDES will pick up where the final permitting standard leaves off, by standardizing data elements related to water pollutant discharge permits.

Other EPA initiatives related to the effort to integrate data within and across agency programs and with partners and stakeholders include the cross-agency Information Integration Program, which is intended to foster the development of an information integration strategy to identify tools and approaches that can be used across the agency and by states and tribes to support improved decision making and increase efficiency. This program culminated in (1) the creation of the Model for Information Integration, which provides a framework for EPA's integration efforts and establishes a vision for its target information architecture; (2) the development of a system of registries that serve as repositories for commonly used data element definitions and information about data (metadata); [6] and (3) an Environmental Information Management System, developed by EPA's Office of Research and Development, which provides descriptive information about various data sets; databases; documents; models; and multimedia projects, enabling users to identify and use the data that best meet their needs.

While the measures taken to date represent noteworthy progress toward the goal of environmental data compatibility and integration, EPA still has some distance to travel and important challenges to overcome. For the most part, the agency has focused on the compatibility of its data with those of state and tribal agencies rather than with the data of other federal agencies and nongovernmental organizations that share an interest in environmental protection. Improved collaboration between federal agencies is essential because (1) individual agencies have different capacities and skills that are complementary and lend themselves to fruitful collaboration and (2) separate attempts have fallen short of supporting the large efforts that are needed to produce high-quality, comprehensive data on environmental conditions and trends. In this regard, EPA's Science Advisory Board, created to provide the agency with expert and impartial external scientific advice, recommended that EPA do more to link its databases with external sources. For example, the Board noted that "answering many health-related questions frequently requires linking environmental data with census, cancer, birth registry, or other data systems (such as water distribution maps) to determine whether there is a relationship between the environmental measures and health."

[6] One such registry, the Environmental Data Registry, contains descriptive information about data managed by the agency, with special emphasis on data elements used by EPA's national systems. The registry is a single comprehensive source of information about the definition, origin, source, and location of environmental data and is the primary tool used by EPA for implementing data standards.

Although EPA officials do not dispute the value of linking the agency's databases with those of other federal agencies and nongovernmental organizations, they note that efforts have been limited by resource constraints and a lack of statutory authority to require other agencies to collect and report data using formats compatible with those used by EPA. Acknowledging that EPA may have unduly focused on state and tribal partners, to the exclusion of federal agencies and others when composing the Environmental Data Standards Council, officials of the Office of Environmental Information pointed out that one of the reasons for publishing proposed data standards in the *Federal Register* for public comment, before making them final, is to solicit the participation and input of other interested and knowledgeable parties, including other federal agencies. They noted that another federal agency, the Department of the Interior's U.S. Geological Survey (USGS), in conjunction with the National Water Quality Monitoring Council, was instrumental in proposing and initiating the development of the standard for Reporting Water Quality Results for Chemical and Microbiological Analytes. In addition, USGS has taken the lead in developing a geospatial data standard, an e-government initiative that is highly relevant to EPA and on which EPA is collaborating.

Data Limitations Still Hinder Development of Results Measures, but Groundwork Is Being Laid for More Effective Performance Measurement

Well before passage of the Government Performance and Results Act of 1993 (Results Act), a number of internal and external studies, including our August 1988 general management review of EPA,[7] called on the agency to manage for measurable environmental results as a way to improve its performance and accountability. As we and others noted, developing effective measures of the environmental results of EPA's policies and program activities would help the agency's managers in assessing the extent to which the agency contributes to environmental improvements and in setting priorities, planning, and budgeting. The effective measurement of environmental results would also serve to make the agency more accountable to the Congress and the public for its performance.

The Results Act, for the first time, formally required EPA and other federal agencies to prepare performance plans containing annual performance goals and measures to help them move toward managing for results.

[7] See U.S. General Accounting Office, *Environmental Protection Agency: Protecting Human Health and the Environment through Improved Management*, GAO/RCED-88-101 (Washington, D.C.: Aug. 16, 1988).

Performance goals and measures were to be used to assess an agency's progress toward achieving the results expected from its major functions. Performance goals established under the act's requirements constitute target levels of performance expressed as tangible, measurable objectives against which actual achievement can be compared. Performance measures constitute the "yardsticks" to assess success in meeting performance goals.

Notwithstanding EPA's timely actions to implement the Results Act's procedural requirements, the agency's progress in moving toward measuring the actual results of its activities has been slow. To a large extent, EPA's performance goals and their associated performance measures continue to be expressed as outputs—environmental standards established, permits issued, enforcement actions taken—rather than as end outcomes, measures that directly show how EPA's work led to improvements in environmental conditions or public health. For example, as shown in table 1, for fiscal year 1999, 86 percent of EPA's 278 performance measures consisted of output measures, while only 14 percent consisted of outcome measures. Three years later, in fiscal year 2002, 71 percent of the agency's 365 performance measures consisted of output measures, while the percentage of outcome measures had moderately increased to 29 percent. For fiscal year 2003, under way since October 1, 2002, EPA has a total of 284 performance measures of which 60 percent are output measures and the remaining 40 percent, outcome measures.

Close examination, however, shows that only a portion of EPA's fiscal year 1999, fiscal year 2002, and fiscal year 2003 outcome measures actually measured end outcomes, the environmental results of its programs and activities (7 percent of fiscal year 1999 performance measures, 22 percent of fiscal year 2002 performance measures, and 27 percent of fiscal year 2003 performance measures).[8] The remaining EPA outcome measures for these 3 fiscal years are more properly classified as measures of intermediate outcomes rather than end outcomes. Intermediate outcomes indicate progress or presumed contributions toward achieving end outcomes. They are used when end outcomes are not immediately clear, easily delivered, or quickly achieved. For example, inducing local

[8] Examples of end outcomes would include ensuring that drinking water is safe or maintaining healthy air with respect to levels of pollutants such as carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead.

jurisdictions to adopt higher water quality standards is an intermediate outcome contributing, presumably, to the end outcome of safe drinking water.

Table 1: Classification of EPA's Performance Measures

Fiscal year	Outputs	Intermediate outcomes	End outcomes	Total outcomes
1999	86% (240 of 278)	7% (18 of 278)	7% (20 of 278)	14% (38 of 278)
2002	71% (260 of 365)	7% (26 of 365)	22% (79 of 365)	29% (105 of 365)
2003	60% (170 of 284)	13% (38 of 284)	27% (76 of 284)	40% (114 of 284)

Source: EPA.

Note: GAO's analysis of EPA's data.

The relatively low percentage of end outcome measures in EPA's collection of performance metrics is largely a reflection of the fact that data and scientific knowledge essential to permit end outcome measurement are often lacking, as well as the fact that there is often a significant time lag between actions taken to protect and improve the environment and demonstrable effects. In addition, other factors, such as the level of economic activity, can have confounding effects, obscuring the role played by EPA programs in environmental change. The data/knowledge problem is one that EPA is attempting to address through its ongoing indicators initiative and anticipated *State of the Environment Report*. While these efforts are expected to identify important data gaps and point to the research needed to improve the scientific understanding of the environment, it may be years before such gaps are filled and research yields dividends of knowledge and scientific understanding sufficient to allow for a more reliable measurement of the environmental results of EPA's program activities. Hence, the measurement of the environmental results of EPA's programs and managing for improved performance are likely to continue to pose a significant challenge for the agency for some time to come.

In addition to the environmental indicators and *State of the Environment Report* initiatives, the agency has undertaken another related initiative that has a similar potential over the longer term to enhance its ability to measure and manage for environmental outcomes. Known as "Managing for Improved Results," this project was launched in the summer of 2001 by EPA's Deputy Administrator, who charged the Office of the Chief Financial Officer with the task of examining a mix of near- and long–term reforms to

improve the agency's ability to manage for results. In response to this charge, a steering group of senior headquarters and regional staff, reporting to the Deputy Administrator, was assembled to (1) examine EPA's management practices, including priority setting, planning, budgeting, and performance tracking/reporting, and (2) explore options both for significant and far-reaching reforms as well as smaller-scale improvements. Among the more far-reaching recommendations that the steering group has made is the recommendation that the agency develop a new strategic-planning architecture with a new goal structure focused on a reduced number of environmentally focused goals, as few as 5 in number (compared with the current 10 strategic goals). With respect to performance measurement, the steering group recommended that EPA's program offices develop better performance measures as part of the strategic plan's goal revision process. Actions envisioned as part of this recommendation include (1) program offices responsible for each strategic objective developing multiyear plans to improve the quality and outcome-orientation of associated annual performance goals and annual performance measures, (2) national program managers and lead regions collaborating to improve measures, (3) goal teams ensuring that data of adequate quality will be available, (4) the Office of the Chief Financial Officer's expansion of its consultation and technical support to the rest of the agency, and (5) using *State of the Environment Report* indicators to guide the development of the next improved generation of outcome-based performance goals and measures.

All of these initiatives aimed at improving EPA's ability to manage for environmental results are, essentially, long-term in nature. They will require a long-term commitment of management attention, follow-through, and support—including the dedication of appropriate and sufficient resources—for their potential to be fully realized. A number of similar initiatives in the past have been short-lived and disappointing in terms of lasting contributions to improved performance management. Just as the forthcoming *State of the Environment Report* is intended to foster an ongoing dialogue between the agency and its partners, including the broader public, both the Environmental Indicators Initiative and the Managing for Results Initiative represent just the beginnings of long-term undertakings. These initiatives' ultimate payoff will depend on how fully EPA's organization and management support them and the extent to which needs identified—for more and better data; for scientific research; for a restatement of strategic goals; and for a refinement of performance goals, objectives, and measures—are addressed in a determined, systematic, and sustained fashion over a period of years. Even the task of revising the

agency's strategic goal structure and reducing the number of goals to a few specifically focused on environmental dimensions will not be an easy matter on which to achieve consensus and, once agreed upon, to implement. As one senior EPA official pointed out, this is particularly true when, as in EPA's case, budgeting is tied to the agency's goal structure.

Significant Progress Made in Enhancing EPA's Information Security

The security of EPA's information is critical to its mission of protecting human health and the environment, a fact underscored by the events of September 11, 2001, and their aftermath. Much of the sensitive information contained in EPA's databases regarding environmental infrastructure, such as municipal drinking water systems and the location of stores of toxic chemicals, could be expected to hold great interest for would-be terrorists and others with criminal intent. In a review of EPA's information security program issued in July 2000, we found serious and pervasive problems that "essentially rendered [the program] ineffective."[9] Our report characterized the agency's security practices at the time as weak and largely a paper exercise that did little to mitigate risks to the agency's data and systems. We recommended that EPA take a number of steps to improve security program management and planning, enhance computer incident management, and strengthen access controls associated with its major computer operating systems and agencywide network.

Since the issuance of our report, EPA and the agency's Office of Inspector General reported that the agency has made substantial improvements to its information security program. The agency has improved its risk assessment and planning processes, implemented major new technical and procedural controls, issued new policies, initiated a regular process of testing and evaluation, and devoted significant attention and resources to improving the technical information infrastructure and building the management framework for an effective security program, as documented by EPA's Office of Inspector General in September 2002 and by an August 2002 GAO follow-up on the status of agency efforts to implement the recommendations in our July 2000 report. Under the leadership of the Office of Environmental Information (OEI), the agency has been taking steps to ensure appropriate public access to the information in EPA's computer systems, while protecting the confidentiality and integrity of its

[9] See U.S. General Accounting Office, *Information Security: Fundamental Weaknesses Place EPA Data and Operations at Risk*, GAO/AIMD-00-215 (Washington, D.C.: July 6, 2000).

information. According to EPA and the agency's Office of Inspector General, specific actions taken to improve information security and to address problems that we, the Inspector General, and others have cited, include the following:

- Developing the Information Security Action Plan to guide EPA's revised security program and respond to the findings and recommendations of our July 2000 report.

- Establishing the Technical Information Security Staff, within OEI, to review EPA's security accomplishments, manage the agency's security efforts, and evaluate needs for future security governance.

- Designating program and regional Information Security Officers, who are responsible for coordinating security activities, providing guidance, reviewing security practices, and informing colleagues of their information security responsibilities.

- Defining, in consultation with EPA's state and tribal partners, levels of security that must be met for the exchange of information across the National Environmental Information Exchange Network. These levels range from Level 1 (public information, available to all users without authentication) to Level 4 (information requiring the highest levels of proof of the integrity and origin of data, along with confidentiality and third-party verification).

In an August 2002 follow-up on the status of EPA's efforts to address our July 2000 report's recommendations, we concluded that although some work remained to be completed to address the problems cited in the report, EPA had made sufficient progress to justify closing out the recommendations. However, notwithstanding the progress EPA has made in this area, EPA's Inspector General continues to identify EPA's security program management as a management challenge (albeit of a lower order than in years past). As the Inspector General has noted, the dynamic nature of security threats will require continued attention and vigilance on the part of EPA management. The agency, moreover, will need to strive to build and maintain a strong centralized security program with an oversight process that identifies and adequately addresses vulnerabilities and to ensure that information resources and environmental data are secure. Given the agency's decentralized organizational structure, it is essential for the success of EPA's information security program that OEI exercise a strong leadership and monitoring role. A major continuing challenge will be

to provide the public with access to a wide range of environmental information, while also protecting against the use of this information in ways that could harm the environment or public health and safety.

EPA's Recently Completed Information Strategy Needs to Be Implemented Systematically and Revised Periodically in Light of Progress and Changing Circumstances

In a September 1999 report, we recommended that EPA develop a comprehensive information management strategy that would (1) establish milestones and identify the resources needed to fill key data gaps; (2) identify and develop necessary data standards; and (3) coordinate its data standardization efforts with other federal agencies, the states, and other entities.[10] In our January 2001 report on EPA's major management challenges and program risks, we reported that, beyond agreeing with our 1999 recommendation, EPA had made limited progress in developing a comprehensive information management strategy to ensure the completeness, compatibility, and accuracy of data.[11]

In July 2002, EPA issued its "Strategic Information Plan: A Framework for the Future," which largely responds to our 1999 recommendation. The plan, developed by EPA's Office of Environmental Information, under the direction of the Chief Information Officer, sets a new vision for EPA's information management, which is to provide government and citizens with fast, relevant, and integrated information about environmental and public health conditions, trends, and potential threats. The plan envisions establishing a system that advances the creation, management, and use of information as a strategic resource at EPA and stresses the need to streamline and strengthen the agency's information management infrastructure to improve the effectiveness and efficiency of its operations and programs. The plan sets six specific information management goals for the agency: (1) improve the use of environmental information, (2) collect appropriate data, (3) strengthen EPA's information infrastructure, (4) enhance access to information, (5) adopt an agencywide approach to using information to make management decisions, and (6) invest in human capital for information management.

EPA's Information Plan provides a much needed long-term strategic vision for the information management function. It charts the course the agency will need to pursue in coming years, in consultation and collaboration with

[10] See GAO/RCED-99-261.

[11] See GAO-01-257.

its state and tribal partners and other key stakeholders, to design and implement systems and services that are aimed at streamlining data collection, making the Internet the method of choice for reporting and exchanging information, and making more effective use of the information it collects.

As previously noted, a number of initiatives are already under way within the agency to implement aspects of the goals laid out in the strategic plan, including data quality improvement, the development and implementation of data standards, and building networks for data exchange. Missing in EPA's strategic information plan, however, are indications of priorities, milestones, and estimated resource requirements that could drive forward movement and provide a more detailed road map for goal implementation. We recommended such an "action plan" in our September 1999 report and continue to believe that an annual or multiyear action plan is needed to translate the "vision" embodied in the strategic plan into specific actions that will advance goal achievement. An action plan would lay out in some detail and specificity the discrete goal-related measures that will be taken during the planning period. It would also establish target dates for the completion of action and identify resources required to meet these milestones. Action plans, we believe, could ensure that EPA's strategic plan becomes and remains a living document that informs agency decision making; guides investments in information infrastructure, technology, and human capital; and evolves over time to reflect achievements, changed circumstances, and new imperatives.

EPA Needs to Implement a Systematic and Comprehensive Human Capital Approach

High-performing organizations in the private and public sectors have long understood the relationship between effective "people management" and organizational success. An organization's people—its human capital—are its most critical asset in managing for results. EPA, like many other federal agencies, has historically given insufficient attention to strategically managing its human capital. As a result, EPA faces critical agencywide human capital challenges that, if not addressed, will limit its ability to achieve its mission. Specifically, the agency has yet to determine the number of employees it needs to accomplish its mission objectives, the technical skills required, and how to best allocate employees among EPA's strategic goals and geographic locations. Furthermore, with a substantial portion of its workforce nearing retirement age, it is imperative that EPA fully prepare for the resulting loss of leadership, institutional knowledge, and scientific expertise.

To its credit, EPA has taken some steps in recent years to improve its human capital management. The agency has conducted a workforce study that identifies some of the general skills and abilities that EPA employees need. Furthermore, the agency has developed a human capital strategy that identifies EPA's vision for its people, its core values, and its major human capital goals. However, EPA is far from being able to implement a systematic and comprehensive human capital approach that will enable the efficient and effective achievement of its mission objectives. Specifically, EPA needs to (1) develop a system for determining the number of employees and skills required to meet its mission objectives and allocating staff according to identified mission needs and (2) recruit, train, and develop employees to ensure that EPA will have the leadership, institutional knowledge, and scientific expertise needed to accomplish its mission, both now and in the future.

EPA Needs to Assess Workforce Requirements and Allocate Staff to Accomplish Mission Objectives

High-performing organizations identify their current and future human capital needs, including the appropriate number of employees, the key skills required for mission accomplishment, and the appropriate deployment of staff across the organization. They then identify and address any human capital gaps or surpluses. However, EPA, like many other federal agencies, has yet to determine its current or future human capital needs for accomplishing its mission or to fully inventory the skills in the current EPA workforce. EPA's 1999 workforce study identified general skills needed by EPA employees (such as effective communication and collaboration) but did not identify the scientific or technical skills critical to EPA's mission. Nor did the study address the number of staff or the skills EPA needs agencywide and by geographic location. In response to a 2001 Office of Management and Budget (OMB) request, EPA, along with other federal agencies, prepared a workforce analysis that included information on the number of its supervisors and managers, their grade level, their location, and the number of people they oversee, and an evaluation of the skills of the workforce. However, because EPA has not yet comprehensively assessed its workforce, EPA's human resource managers told us that the analysis that it submitted to OMB is only a starting point for a systematic workforce analysis.

Without reliable and valid workforce information, EPA cannot ensure that it is hiring the right number and type of people or allocating existing staff resources to effectively meet current or future mission needs. During the past 12 years, when the size of the civilian federal workforce was reduced significantly, EPA increased its workforce from 15,277 in

fiscal year 1990 to 17,802 in fiscal year 2002. In doing so, EPA hired thousands of employees without systematically considering the workforce impact of the changes in environmental laws and regulations, the technological advances, or the expansion in state environmental staff that occurred during the 1990s. Similarly, EPA has yet to factor these workforce changes into its allocation of existing staff resources to its headquarters and regional offices to meet its strategic goals. Furthermore, if EPA should need to downsize, as other federal agencies have done, it would not have the information needed to ensure that staff reductions could be absorbed with minimal impacts on mission objectives. For example, the Congress denied EPA's proposal to downsize its enforcement staff in order to shift resources to state enforcement grants because EPA had no workforce information to demonstrate that staff reductions would not jeopardize environmental enforcement.

In July 2001, we recommended that EPA develop a system for workforce allocation and deployment that is explicitly linked to the agency's strategic-planning efforts and is based on the systematic efforts of each major program office to accurately identify the size of the workforce, the deployment of staff geographically and organizationally, and the skills needed to support EPA's strategic goals.[12] EPA has begun to develop a system, known as the "national strategic workforce planning system," that may substantially implement this recommendation. The system is to be used by EPA regions and in headquarters offices to assess workforce needs. According to EPA, the system will, among other things, identify the technical skills and the number and type of positions required, inventory the skills of the current workforce, examine attrition rates, and forecast the number of new hires required. EPA issued a methodology for the workforce-planning system in September 2002 and has begun implementing the system in several headquarters offices and in the Chicago, Kansas City, and Seattle regional offices. EPA expects agencywide implementation of the workforce-planning system to be under way by late 2003.

Although EPA's proposed workforce-planning system appears promising, it is too early to determine how it will affect EPA's ability to systematically allocate staff. As EPA's Deputy Assistant Administrator, Office of

[12] See U.S. General Accounting Office, *Human Capital: Implementing an Effective Workforce Strategy Would Help EPA to Achieve Its Strategic Goals*, GAO-01-812 (Washington, D.C.: July 31, 2001).

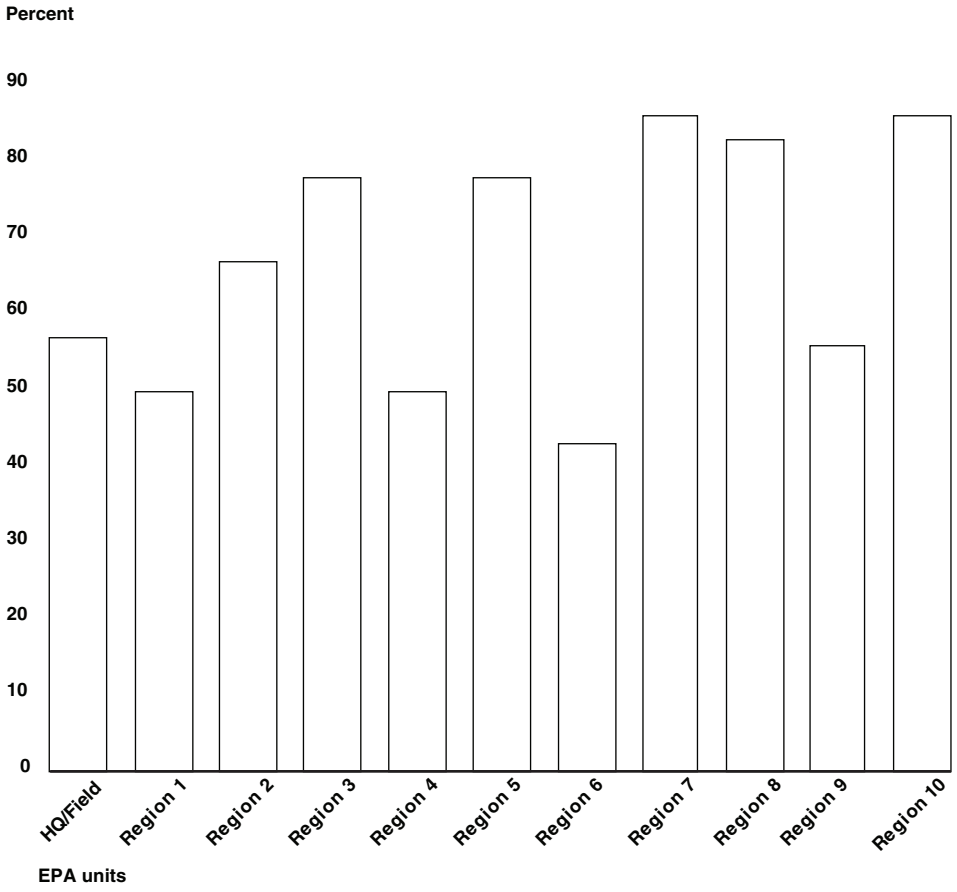
Administration and Resources Management, acknowledged, EPA has made progress in workforce planning, but the most difficult challenges remain—such as using workforce data to make difficult staffing decisions. For example, EPA's workforce planning will need to take into account the agency's extensive use of grants to states and awards to contractors to perform EPA's work. The agency estimates that its contracted work alone would require an additional 11,000 to 15,000 employees if contractors were not used. Thus, EPA must plan for a workforce that is adept at both delivering services directly and managing the cost and quality of services delivered by third parties on the government's behalf. In addition, EPA must work diligently and effectively to gain support for its workforce-planning efforts within both the executive and legislative branches.

Moreover, EPA's workforce-planning system, along with the agency's other human capital efforts, will need to incorporate the implications of major management initiatives. Specifically, EPA has undertaken a comprehensive effort to assess the state of the environment, identify priorities for environmental and human health improvements, and focus its resources on achieving results in the areas of greatest concern. EPA is currently working to integrate its "state of the environment" effort into its agencywide strategic plan. According to EPA officials, the revised strategic plan will largely determine EPA's workforce needs, and workforce allocation will be tied to the relative priority assigned to strategic goals. Once the strategic plan is finalized (expected in late 2003), EPA will then need to determine its impact on the agency's human capital resources and systems.

EPA Needs to Ensure Continuity of Leadership and Mission-Critical Skills

To ensure a continuing ability to accomplish their mission objectives, federal agencies need to aggressively pursue comprehensive succession planning and executive development to address the loss of leadership and institutional knowledge that will result from Senior Executive Service (SES) retirements. At EPA, 162 senior executives, or 60 percent, will become eligible for retirement in the next 5 years. As shown in figure 1, potential retirements may create particularly severe leadership shortages in some EPA units and regions, such as region 7 (Kansas City) and region 10 (Seattle), where about 86 percent of the executives will become eligible to retire over the next 5 years.

Figure 1: Percentage of Total SES Staff Eligible to Retire by 2008, by EPA Unit/Region



Source: EPA.

Note: GAO's analysis of EPA's data.

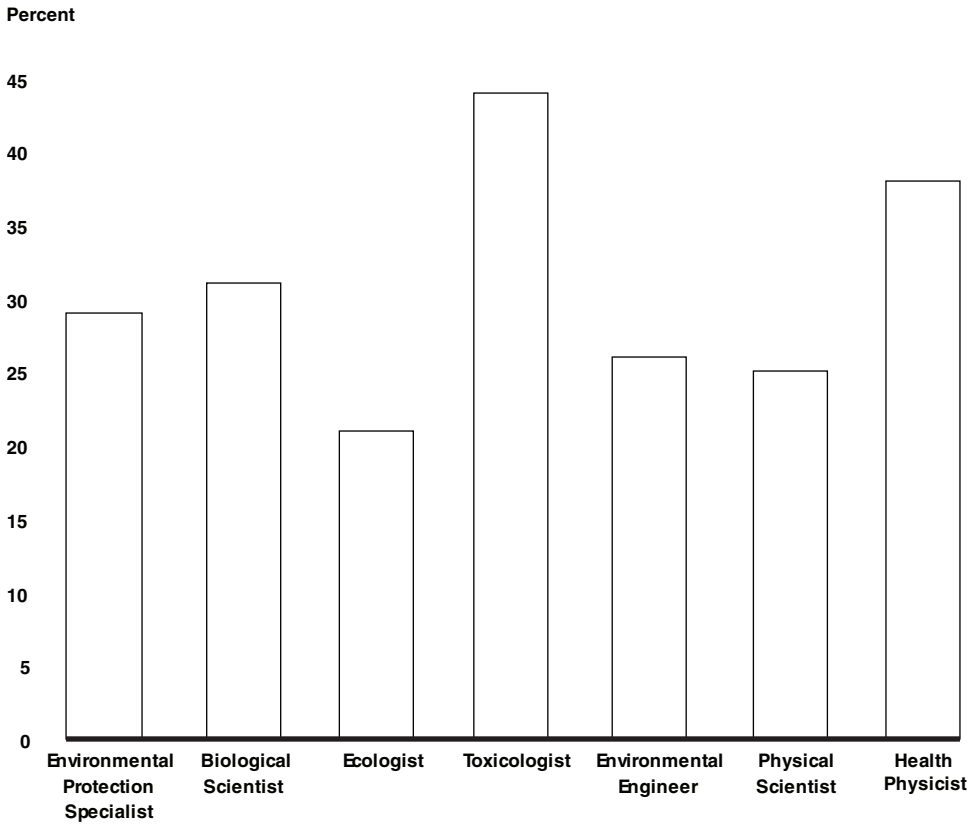
We reported in July 2001 that EPA did not have succession planning in place to ensure continuity in the agency's leadership and to prepare for the management losses that would likely occur, as many executives become eligible for retirement.[13] We recommended that EPA work toward

[13] See GAO-01-812.

designing succession plans to maintain leadership continuity that are based on (1) a review of current and emerging leadership needs and (2) identifying sources of executive talent within and outside EPA. In response, EPA reinstated a development program for SES candidates, which is expected to prepare 51 candidates for leadership positions. According to EPA, a number of these candidates may be ready in the summer of 2003 for Office of Personnel Management certification as senior executives. In addition, EPA has implemented a management training program for new and current mid-level supervisors. However, it remains to be seen how successful these programs will be in developing the executive resources that the agency needs. EPA implemented the management development programs before assessing how revising its strategic objectives would affect its current and emergent leadership needs. Therefore, EPA may need to modify these programs once its strategic plan is finalized.

EPA also faces challenges in sustaining adequate scientific expertise to carry out its mission. EPA acknowledges that its efforts to protect human health and the environment must be based on the best available science. However, EPA's scientific performance has been criticized many times in reports by the National Research Council, EPA's Science Advisory Board, and GAO, among other organizations, and in countless complaints and lawsuits from stakeholders. In the National Research Council's opinion, the concerns about EPA's scientific performance are related to the agency's ability to attract and retain first-rate scientific talent, given intense job market competition from the private sector and academic institutions. EPA's challenge to maintain adequate scientific expertise could intensify in the coming years, as many agency scientists become eligible for retirement. As shown in figure 2, a significant portion of EPA's key scientific and technical staff—environmental protection specialists, biological scientists, ecologists, toxicologists, environmental engineers, physical scientists, and health physicists—will become eligible for retirement by the end of 2008.

Figure 2: Percentage of EPA Staff in Key Scientific/Technical Occupations Eligible for Retirement by 2008



Source:EPA.

Note: GAO's analysis of EPA's data.

EPA can fill the gaps in scientific expertise that may arise from these retirements through targeted recruitment efforts to hire "outside" expertise and by training current staff to develop the needed expertise. To improve its ability to recruit highly qualified scientists, EPA is considering the use of special hiring authority modeled on a National Institutes of Health program to select and retain senior scientists. Under this special authority, EPA would establish competitive, limited-term (although renewable) appointments for research scientists and engineers. The agency believes that the special authority would increase EPA's flexibility to respond to emerging environmental problems, establish a performance-based career

path for scientists, and reward scientific staff working on high-priority environmental research. While such special authority might hold promise, EPA officials acknowledge that the initiative is still in the developmental stage. Therefore, it is too early to say how well the proposed personnel authority would help EPA select and retain highly qualified scientists. In addition to recruiting outside scientific talent, EPA also needs to help current employees upgrade their scientific expertise through internal or external training opportunities. Thus far, however, EPA's strategy for developing its workforce has aimed to enhance general competencies, such as communication and collaboration, rather than specific mission-critical scientific or technical skills.

EPA and State Efforts to Implement Innovative Regulatory Approaches May Need Legislative Support

For some time now, EPA has been counting on its efforts to "reinvent" environmental regulation to improve the efficiency and effectiveness with which the agency and the states carry out their environmental responsibilities. A key agency assumption has been that considerable innovation can take place within the existing statutory environmental framework. However, our work shows that limited progress in regulatory innovation has been made to date, and that statutory constraints have served as a major barrier. Although EPA has recently made vague references to the impetus that statutory revisions could provide to regulatory innovation, the agency needs to more clearly state the legislative changes it would endorse to overcome constraints to innovation.

EPA Has Tried a Variety of Initiatives to "Reinvent" Environmental Regulation

Under the existing federal approach to environmental protection, EPA, pursuant to statutes such as the Clean Air Act and Clean Water Act, prescribes regulations with which states, localities, and private companies must comply. But this approach has often been criticized in recent years for being costly, inflexible, and ineffective in addressing some of the nation's most pressing environmental problems. For example, the National Academy of Public Administration recently reported that although traditional regulatory approaches manage to keep most forms of industrial pollution in check, they are too narrow in scope to affect many other more difficult problems and sources of pollution or environmental degradation, such as diffuse sources of water pollution caused by urban and agricultural runoff. Moreover, even where existing approaches have succeeded in curtailing pollution from major industrial sources, they have often been costly and have provided regulated entities with little incentive to reduce pollution below mandatory compliance levels.

EPA responded to such concerns during the 1990s with a variety of initiatives intended to encourage innovative regulatory strategies that could streamline environmental requirements while encouraging more effective means of protecting the environment. Among the agency's "flagship" programs was Project XL, which encouraged individual regulated facilities to propose projects that EPA would test to determine whether alternative approaches could achieve compliance at lower cost and produce greater environmental benefits. In addition to pursuing a number of other "high-priority actions" and a number of "other significant actions" to encourage innovation, EPA stressed that the agency's overall support for the reinvention effort was part of an effort to transform the agency's culture to encourage staff to think about and embrace innovative approaches to environmental regulation.

EPA's "reinvention" efforts of the 1990s encountered a number of problems both within and outside the agency. These problems illustrated issues that needed to be resolved in order for environmental regulation to truly be "reinvented." Specific examples follow:

- Key stakeholders in the reinvention process expressed concern over the large number of complex and demanding initiatives under way—as well as confusion over the underlying purpose of some of the agency's major initiatives.

- EPA had difficulty in achieving "buy-in" among the agency's rank and file, who were accustomed to the long-standing regulatory structure.

- EPA had difficulty in achieving agreement among external stakeholders (including federal and state regulators and representatives of industry and environmental organizations) in a number of its reinvention efforts, particularly when stakeholders perceived that unanimous agreement was required before progress could be made.

- EPA had a mixed record in evaluating the success of many of its initiatives and was therefore unable to provide convincing evidence to external stakeholders of the merits of pursuing an alternative regulatory strategy.

Of perhaps greatest significance, much of the regulated community—whose participation is crucial for reinvention to succeed—expressed strong reservations about the prospects for reinvention within the current statutory framework. In fact, a study by Resources for the Future concluded that "industry participants in reinvention programs generally steer the programs to peripheral matters because their counsels general caution them against taking any action that might result in litigation."[14] Similarly, several of our studies found that states' experimentation with pollutant trading and other innovative environmental strategies was often constrained by the statutory framework.[15]

Recent GAO Findings Confirm Limitations on Ability to Innovate under Current Statutory Framework

In January 2002, we issued a report that cast doubt on EPA's ability to achieve significant innovation in the absence of legislative changes.[16] The report contained detailed analyses of 20 initiatives that 15 states cited as being among the key initiatives they had pursued. Specifically, we asked state environmental officials to rank, in order, the most serious obstacles that had impeded progress in pursuing these initiatives successfully. Among the most serious impediments identified were federal regulations governing the implementation of specific programs (ranked first or second in 12 of the 20 cases).[17] EPA has long maintained that it could address these kinds of impediments through informal mechanisms and administrative actions. However, our report countered this claim, noting that EPA's ability to inject flexibility into its regulatory programs was limited without clear statutory authorization. Specifically, we concluded that current legislation does not contain explicit language authorizing the use of innovative

[14] See Resources for the Future, *Industry Incentives for Environmental Improvement: Evaluation of U.S. Federal Initiatives* (Washington, D.C.: September 1996).

[15] See U.S. General Accounting Office, *Environmental Protection: Status of EPA's Initiatives to Create a New Partnership with States*, GAO/T-RCED-96-87 (Washington, D.C.: Feb. 29, 1996). Also, see U.S. General Accounting Office, *Environmental Protection: Challenges Facing EPA's Efforts to Reinvent Environmental Regulation*, GAO/RCED-97-155 (Washington, D.C.: July 2, 1997).

[16] See U.S. General Accounting Office, *Environmental Protection: Overcoming Obstacles to Innovative State Regulatory Programs*, GAO-02-268 (Washington, D.C.: Jan. 31, 2002).

[17] States also cited as a significant obstacle a cultural resistance among many in EPA toward alternative approaches—a resistance that, they maintained, often manifested itself in a lengthy and costly EPA review of their proposals. But this cultural resistance was often tied to the regulations themselves—participants were often concerned that strict application of the regulations was needed to reduce the risk of lawsuits filed by private interest groups.

environmental approaches in lieu of specific regulatory requirements, and the absence of this "safe legal harbor" for EPA has been a significant obstacle to states and others in their efforts to test innovative proposals. The absence of this "safe harbor" has also tended to reinforce the cultural resistance to innovation that EPA is seeking to change.

EPA's key initiatives have achieved varied success, further underscoring questions about how well EPA's reinvention efforts will fare without some kind of legislative support. For example, through the end of 2000, the agency had invested considerable time and resources in pursuing innovations under Project XL. The Administrator had set and achieved the goal of signing agreements for at least 50 XL projects by the end of that year. However, no new projects have been initiated, and EPA reinvention officials indicated recently that the program is now changing focus dramatically. Ongoing projects will continue, but any new projects will need to meet a more selective test of being "bigger, bolder, and more strategic." EPA officials cited Massachusetts' Environmental Results Program as an example of a project meeting this test because the underlying concepts apply broadly to a number of facilities, as opposed to the single-facility focus of many past XL projects.

EPA has recently taken steps to make its innovation efforts more systematic and organized. In April 2002, the Administrator released a new innovation strategy to help the agency strengthen innovation partnerships with states, focus innovation on priority issues, diversify environmental approaches, and foster a more innovative EPA culture.[18] To support the implementation of the strategy, EPA has launched a pilot grant program to fund state innovations that address the environmental priorities identified in the strategy. EPA also plans to form the National Center for Environmental Innovation to support implementation of its strategy, provide leadership on environmental innovation, and manage key innovation programs. To help assess the results of its efforts, EPA staff are tracking innovations and reporting on them quarterly to agency management.

EPA's latest approach to bolstering environmental innovation is understandable, given the fundamental barriers to broader regulatory experimentation posed by the current statutory framework. However,

[18] See Environmental Protection Agency, *Innovating for Better Environmental Results* (April 2002).

unless these statutory barriers are addressed more directly, it remains to be seen whether EPA's recent efforts to promote innovation will fare much better than its past efforts. EPA's innovation strategy hints at some kind of statutory encouragement of regulatory innovation, noting that the agency plans to "engage in dialogue with parties that are interested in applying the flexibility and multimedia dimensions of these and other innovation programs more broadly through new legislative authority." Such cryptic endorsement of legislative change appears to be a small step in the right direction, but alone, it will do little to encourage states and the regulated community to participate actively in innovative projects. Nor will it provide tangible assurances for the environmental community and other interest groups that such projects can proceed without damaging the environment. EPA needs to exert leadership in this area by articulating a clearer and more specific endorsement of legislation that would more directly address the root cause of the problems that have, for so many years, impeded its regulatory reinvention efforts.

EPA Needs to Improve Its Grants Management to Better Achieve Its Mission Objectives

Effective grants management is essential for any federal agency that uses grants as a vehicle to commit taxpayer money toward achieving public purposes. Effective grants management is of particular importance for EPA because it typically spends about half of its annual budget on grants. In fiscal year 2002, EPA expended about $4 billion of its $7.8 billion budget[19] on grants, which it distributed to over 3,300 recipients, including state and local governments, tribes, universities, and nonprofit organizations. EPA awards grants to support its ongoing programs—such as hazardous waste cleanup and wastewater treatment—as well as to fund discretionary short-term projects—such as training and outreach. The wide diversity of grant recipients and wide range of activities that EPA grants support present the agency with a formidable challenge to ensure that all awarded grants are used to achieve the agency's overall mission of protecting human health and the environment.

For many years, our reports and numerous other internal and external agency management studies have called for EPA to manage its resources to achieve environmental results. With such a high percentage of its resources devoted to grants, the agency's ability to manage for results largely depends on how well it manages its grants. However, in many cases, EPA has

[19] The fiscal year 2002 budget amount does not include unobligated balances from previous budget authority.

not managed its grants so that they are effectively used to achieve environmental results. EPA's project grants have often been awarded without a clear plan for how the project will help achieve EPA's mission or produce tangible environmental benefits. Furthermore, after years of improvement initiatives, EPA still struggles to efficiently and effectively administer its grant process to ensure that available resources deliver the maximum effect.

EPA Needs to Better Plan and Measure Grant Results

To help federal agencies more effectively use their resources to achieve results, the Government Performance and Results Act of 1993 requires federal agencies to prepare strategic plans and goals and to devise measures to gauge progress toward these stated objectives. Since submitting its first strategic plan to the Congress in 1997, EPA has continued to refine its plans, goals, and performance measures to help it focus agency resources on environmental results. However, EPA's planning and performance measurement for project grants has often been disconnected from EPA's efforts to manage for an improved environment, as shown below:

- EPA selects project grants before considering how the projects would contribute to achieving the agency's strategic goals. In 2001, we reported that EPA program officials treated EPA's strategic goals and objectives not as a tool to guide the selection of project grants, but rather as a clerical tool for categorizing grants after the funds were already awarded.[20] By assessing the relevance of these grants to EPA's strategic plan after the selection process, EPA cannot ensure that it is selecting the projects that will best help the agency accomplish its mission.

- EPA often does not require grantees to submit work plans to explain how a project would achieve measurable environmental results. In 2002, EPA's Inspector General reported that EPA approved grantee work plans without determining the projects' long-term human health and environmental outcomes.[21] Instead, EPA funded grants on the basis of

[20] See U.S. General Accounting Office, *Environmental Protection: Information on EPA Project Grants and Use of Waiver Authority*, GAO-01-359 (Washington, D.C.: Mar. 9, 2001).

[21] See EPA Inspector General, *Surveys, Studies, Investigations, and Special Purpose Grants*, Report No. 2002-P-00005 (Mar. 21, 2002).

work plans that focused on short-term, procedural results, such as meetings or conferences.

- EPA often does not measure what results are being achieved with grants. We reported in September 2000 that EPA did not have criteria to measure the effectiveness of its Science to Achieve Results grant program.[22] Instead, EPA's management of the program focused on the procedures and processes of awarding grants. As a result, EPA was uncertain about what the program was achieving. Similarly, the EPA Inspector General reported in 2002 that, in many cases, EPA had not measured whether the grants it had awarded were achieving meaningful environmental benefits.[23] In fact, for almost half of the 42 grants reviewed, EPA did not even attempt to measure the projects' outcomes. In some cases, the Inspector General concluded that what the grant funding had accomplished was unknown or unclear.

EPA has acknowledged that its planning and performance measurement for grants need to better focus on environmental results, and has promised to take corrective action. EPA has recently announced that it will upgrade its training for project officers and managers to emphasize the importance of planning grants to achieve environmental results. EPA has also announced that it will issue guidance to help ensure that all grant work plans include a discussion of how grantees plan to measure and report on environmental progress. However, the agency has also expressed reservations about the extent to which grant projects can be planned to achieve environmental results. The Assistant Administrator for EPA's Office of Administration and Resources Management stated that the Paperwork Reduction Act and OMB regulations may affect EPA's ability to request that recipients collect information to measure the results of EPA-funded activities. The Assistant Administrator also stated that the limitations that currently exist in environmental outcome measurement could affect the agency's ability to measure the results of funded projects.

Planning for grants to achieve environmental results—and measuring those results—is a difficult challenge, especially for projects such as outreach or training. However, in view of the fact that EPA spends about

[22] See U.S. General Accounting Office, *Environmental Research: STAR Grants Focus on Agency Priorities, but Management Enhancements Are Possible*, GAO-RCED-00-170 (Washington, D.C. Sept. 11, 2000).

[23] See footnote 21.

half of its budget on grants, it is imperative that EPA wholeheartedly accept this challenge. Certain EPA-funded projects have already demonstrated that outcome-based grant planning and measurement are possible. For example, in seeking funding for outreach to local building code officials about indoor air quality issues, a nonprofit organization designed a grant project to deliver tangible environmental results. That is, the project measured results in terms of actions that affect human health—in this case, the construction of homes that resist the release of radon into the indoor air. Regarding the Assistant Administrator's concerns about the state of environmental outcome measurement, it should be noted that EPA's Office of Environmental Information and Office of Research and Development are currently collaborating on developing a new generation of outcome-based goals and measures using environmental indicators to help improve performance measurement. As EPA improves its planning and measuring of environmental results, it is important that the agency fully integrate these improvements into its grants planning and performance management.

EPA Needs to Better Administer Grant Resources to Maximize Results

Along with improved planning and performance measurement for grants, EPA also needs to improve its stewardship of grant funding to maximize the impact of available resources. The effective management and oversight of grants helps ensure that the agency funds the best projects at the least cost, that grant money is properly used to accomplish the intended results, and that funded projects are completed in a timely manner. Historically, EPA has experienced various problems in grants management and oversight, and these problems have persisted in recent years, as shown below:

- EPA has not ensured that it obtains the best price through competition for project grants. EPA's Inspector General reported in 2001 that EPA officials gave grants to the same recipients year after year without competition or selected certain grantees without competition on the basis of the undocumented belief that the grantee was "uniquely qualified."[24] In 2002, the Inspector General reported that grant recipients, in turn, awarded contracts for EPA-funded work without determining the reasonableness of the contractor's price, instead selecting contractors on the basis of familiarity or in some cases awarding contracts to their own subsidiaries without competition.[25]

- EPA has not provided effective oversight to ensure that grant funds are used only for allowable purposes. In 2001, we reported that EPA's oversight of nonprofit grantees was not sufficiently rigorous to uncover expenditures for unallowable costs.[26] Specifically, we found that EPA conducted oversight reviews of only 4 percent of its nonprofit grantees and that these reviews were not designed to identify unallowable costs.

- EPA has sometimes not ensured that its grantees have proper financial and internal controls in place to ensure that federal funds are properly used. For example, the EPA Inspector General found that one grantee could not adequately account for over half of its $300,000 in EPA grant funding. Another grantee submitted multiple financial status reports showing conflicting ending balances for its grant funding.

- EPA has often not ensured that grant projects are completed in a timely manner. In September 2000, we reported that EPA had not tracked its Science to Achieve Results research grants to ensure their on-time completion.[27] We found that 144 of the nearly 200 grantees reviewed had missed their deadline for submitting final reports, even after extensions had been granted.

[24] See *EPA's Competitive Practices for Assistance Awards*, Report No. 2001-P-00008 (May 21, 2001).

[25] See Environmental Protection Agency, *Procurement Made by Assistance Agreement Recipients Should Be Competitive*, Report No. 2002-P-00009 (Mar. 28, 2002).

[26] See U.S. General Accounting Office, *Environmental Protection: EPA's Oversight of Nonprofit Grantees' Costs Is Limited*, GAO-01-366 (Washington, D.C.: Apr. 6, 2001).

[27] See footnote 22.

- EPA does not have an automated data system that it can rely upon to provide consistent and accurate information to support grants management. EPA's system does not generate reports needed to effectively monitor grants, and individual grantees do not always have unique identifiers in the system but may appear under multiple names or identification numbers.

EPA has recently taken various actions intended to improve its management and oversight of the grants it awards, such as (1) issuing an order to require competition in the award of many grants and to require detailed justifications for noncompetitive awards; (2) conducting training sessions about competitive procurement requirements for grant recipients and EPA personnel; (3) revising agency policy to require EPA staff to conduct more on-site reviews of grant recipients and to check for unallowable costs in grantee spending; (4) developing a new data system to better track funding amounts, project milestones, and agency oversight activities; and (5) developing a long-term strategic plan for grants management that is intended to improve accountability, coordination, and resource management for EPA grants.

Although these actions appear promising, EPA has a long history of undertaking initiatives to improve grants administration, and, despite years of corrective actions, problems persist. The EPA Inspector General recently concluded that some agency actions to address grant weaknesses have not been effective, and in May 2002 recommended that EPA designate grants management as a material weakness under the Federal Managers' Financial Integrity Act. OMB also recommended that EPA identify grants management as a material weakness. OMB believes that a strong grants competition policy, along with improved prioritization, oversight, and enforcement procedures, is needed to improve EPA's grants management and will ultimately lead to better environmental outcomes.

Notwithstanding the Inspector General's and OMB's recommendations, in November 2002, the Administrator concurred with the recommendations of EPA senior managers not to declare the agency's grants management to be a material weakness under the Integrity Act. The agency justified its decision on the basis of the policies it had recently issued to improve competition in awarding grants and to strengthen the agency's monitoring of grant recipients. EPA does, however, consider grants management to be an "agency level" weakness under the Integrity Act—a weakness that does not merit the attention of the President or Congress but is significant enough to require regular reporting to the Administrator. While EPA's

classification of grants management under the Integrity Act may be the subject of debate, it is clear that improving grants management must be a top priority for the agency. With about half of EPA's budget devoted to grants, the agency's ability to efficiently and effectively accomplish its mission largely depends on how well it manages its grant resources.

EPA Needs to Improve Internal Controls over Its Financial Reporting

EPA's Inspector General issued an unqualified opinion on EPA's consolidated financial statements for the fiscal year ended 2001. However, when it considered internal controls over financial reporting, the Inspector General identified three reportable conditions that could adversely affect the agency's ability to process, summarize, and report financial statement data. Additionally, in its assessment of compliance with laws and regulations that relate to financial statement reporting, the Inspector General identified two instances of noncompliance, only one of which was substantial. While noteworthy, neither instance of noncompliance would result in material misstatements to the audited financial statements.

EPA had three reportable conditions in fiscal year 2001. The first was its failure to implement Statement of Federal Financial Accounting Standard (SFFAS) No. 10, *Accounting for Internal Use Software*, until the end of fiscal year 2001, even though the standard was applicable for the entire fiscal year. SFFAS No. 10 requires the capitalization of the full cost (direct and indirect) of internal use software whether it is commercial off-the-shelf, contractor developed, or internally developed. In addition, some of the supporting documentation used to identify capitalized software cost was insufficient to determine whether such costs exceeded the capitalization threshold. Because EPA issued guidance at the end of fiscal year 2001 for capitalizing internally developed software, the Inspector General did not believe a recommendation was warranted.

The second reportable condition concerned the interagency agreement invoice (IAG) approval process. EPA project officers did not fulfill oversight duties related to reviewing and approving interagency agreement invoices. The Inspector General has continued to find instances where program offices did not receive support for IAG invoices paid, did not promptly approve payable IAG invoices, or did not identify the proper account to be charged. EPA agreed with the Inspector General's findings and, according to the agency's management, EPA has implemented an automated project officer approval system that addresses this finding.

The third reportable condition dealt with automated application processing controls for EPA's Integrated Financial Management System (IFMS). The lack of system documentation made it impossible to assess the adequacy of the automated internal control structure as it related to automated input, processing, and output controls for the IFMS system. The Inspector General found that EPA has taken tangible steps to replace the IFMS with the Financial Replacement System (FinRS) project. However, the Inspector General will not be able to sufficiently assess the adequacy of the automated internal control structure until the new system is in place.

The Inspector General's tests of compliance with the Federal Financial Management Improvement Act of 1996 disclosed an instance where EPA's financial management systems did not substantially comply with SFFAS No. 4, *Managerial Cost Accounting Concepts and Standards for the Federal Government*. Specifically, EPA did not comply with the requirements to provide cost per output to management in a timely fashion. In addition, under EPA's current cost-accounting structure, when costs by output are produced, such costs are not described in sufficient detail to be useful to managers. EPA took exception to these Inspector General findings, stating that the agency believes it is in compliance with the managerial cost accounting standard. According to EPA's management, cost-per-output information is provided to program managers on a regular basis. The resolution of this issue will likely be the topic of future discussions between EPA management and the Inspector General.

EPA was noncompliant with appropriation law when making disbursements for grants funded with more than one appropriation. Specifically, disbursements for these grants were made using the oldest available funding (appropriation) first, which might or might not have been the appropriation that benefited from the work performed. Consequently, EPA was not in compliance with title 31, U.S. Code, section 1301, which requires EPA to match disbursements to the benefiting appropriation. In fiscal year 2001, EPA adopted new procedures for allocating costs on such grants for new awards. Therefore, it is anticipated that the problem will be corrected as the remaining obligated balances are liquidated.

Although the Inspector General has identified several internal control weaknesses, it appears that corrective actions are well under way. The successful completion of these efforts to correct identified reportable conditions and compliance issues will assist EPA in providing its managers and the Congress with more timely and reliable financial information.

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