United States General Accounting Office

GAO

Testimony

Before the Legislation and National Security Subcommittee, and the Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives

For Release on Delivery
Expected at
1:00 p.m. EST
Monday
March 29, 1993

ENVIRONMENTAL PROTECTION

EPA's Actions to Improve Longstanding Information Management Weaknesses

Statement for the Record by JayEtta Z. Hecker, Director
Resources, Community, and Economic Development
Information Systems
Information Management and Technology Division

Chairman Conyers, Chairman Synar, and Members of the Subcommittees:

I appreciate this opportunity to discuss our completed and ongoing work on information resources management (IRM) at the Environmental Protection Agency (EPA).[1] Because much of this work has been specifically requested by Chairman Synar's Subcommittee, he and some of the other members are keenly aware of the information management problems and challenges that lie ahead for the newly appointed Administrator. At Chairman Synar's request, we are currently evaluating such problems with EPA's existing chemicals review program under the Toxic Substances Control Act (TSCA). Additionally, we are examining EPA's actions to address longstanding agencywide information management deficiencies. We will be issuing reports on both matters in the near future, which will discuss the results of our work in a more comprehensive manner.

In his testimony before you this afternoon, my colleague, Mr. Hembra, addressed the scientific and monitoring information gaps that impair EPA's analyses supporting its regulatory decisions. He also pointed out how much of the agency's information is largely activity-based indicators that by themselves do not directly address program success or measure environmental results. I would like to amplify the importance of these information concerns by first discussing specific agencywide IRM deficiencies at EPA and demonstrating how they translate into program ineffectiveness; second, outlining EPA's recent responses to its longstanding information management problems; and finally, sharing our observations on key factors that may affect the agency's success in meeting its challenges in this area.

INFORMATION IS VITAL TO EPA's MISSION

Information itself is one of EPA's most important resources. How well the agency manages this resource directly influences its ability to perform its statutory responsibilities. Although top management ultimately shoulders the burden of achieving EPA's missions, their success is closely tied to the quality of support provided by the agency's information systems. Collecting, processing, storing, analyzing, reporting, and sharing environmental data are all essential to the agency's environmental monitoring and protection responsibilities. Without complete and dependable data, EPA cannot make accurate environmental risk assessments, establish

---

[1]Information management involves identifying needs and sharing information; ensuring standardization, security, and integrity of data; and managing records. Information technology management involves controlling computer hardware, software, and telecommunications used to help manage information. The integrated management of information and technology is achieved under what is called information resources management, or IRM. Federal requirements for an effective IRM program are broadly established in section 3506 of the Paperwork Reduction Act of 1980 and OMB Circular A-130.

its priorities, or track its progress. Equally important is the fact that much of the scientific data it collects are unique and invaluable to others involved in separate but related environmental analyses. The increasing importance of information is reflected in EPA's 18-percent average annual growth in IRM investment over the last decade. In fiscal year 1993, EPA expects to spend nearly $320 million for its major IRM expenditures.[2]

LONGSTANDING INFORMATION MANAGEMENT PROBLEMS PERSIST

Despite previous Administrators' recognition of EPA's dependence on information, the agency has longstanding IRM problems that we have repeatedly reported to EPA and the Congress and that have been echoed in numerous EPA Inspector General (IG) reviews (see attachments). EPA is an agency with hundreds of information systems that are mostly separate and distinct, with their own structures and purposes. This plethora of systems impairs EPA's ability to easily share mutually beneficial information across program boundaries, fosters data duplication, and precludes more comprehensive, cross-media assessments of environmental risks and solutions. EPA's managers and analysts find many of the agency's automated systems too difficult to use or ill-designed to measure and assess environmental results, because few were designed for this purpose. Instead, the information systems with the bulk of the agency's data contain activity-related data--chiefly designed to record, count, track, and report on such items as the number of permits issued, levels of pollutants discovered, or types of enforcement actions taken. Additionally, data quality and integrity remain a chief concern because of inattention to strong quality assurance and data administration practices. These problems, I might add, are not necessarily unique to EPA, but are common across many federal agencies.[3]

IRM WEAKNESSES TRANSLATE INTO PROGRAM SHORTCOMINGS

These data problems reflect EPA's deficiencies in adhering to existing governmentwide policies and standards guiding the acquisition and use of automated data processing

---

[2]This figure accounts only for EPA's major automated data processing (ADP) expenditures, as reported to the Office of Management and Budget (OMB) under Circular A-11. Because it does not include other related IRM costs such as data collection, preparation, and maintenance, this figure significantly understates EPA's actual IRM expenditures.

[3]Information Resources: Summary of Federal Agencies' Information Resources Management Problems (GAO/IMTEC-92-13FS, Feb. 13, 1992).

resources. However, to view these weaknesses solely as a compliance issue risks minimizing their larger impact. Cumulatively, IRM deficiencies seriously impair EPA's ability to effectively carry out its program responsibilities. Let me illustrate with a few examples from our completed work on EPA's use of information systems to support cross-media enforcement, the reregistration of pesticides, and EPA's toxic substance information systems. Other work done under the direction of Mr. Hembra on compliance with the agency's enforcement policies, management of hazardous wastes, and controls over drinking water quality likewise highlight serious data collection and management problems.

In the cross-media enforcement area, deficiencies in developing information systems to integrate data on regulated facilities' noncompliance with environmental regulations--combined with the absence of a complete strategy for cross-media information management--are impeding EPA's ability to enforce environmental laws and regulations. EPA cannot readily bring together and correlate data from its various programs--such as air, water, hazardous wastes, and pesticides--to comprehensively assess environmental risks, identify and target the most important enforcement priorities, and conduct general program oversight. Consequently, EPA cannot identify and rank the nation's worst polluters and set enforcement priorities accordingly.

Despite spending some $14 million on information systems, EPA still cannot easily assemble accurate, reliable, complete information on chemicals in the pesticide reregistration process because it lacks integrated databases. As many as nine separate databases are used to track information about pesticides awaiting reregistration, including the results of health and environmental studies. As a result, compiling information about pesticides undergoing reregistration remains difficult, labor-intensive, and time-consuming. For example, in the summer of 1991, when a trainload of metam sodium spilled into the Sacramento River, EPA was unaware of the information in its files indicating that metam sodium can cause birth defects. It was weeks before the agency warned pregnant women and workers in the area of the pesticide's hazards. Information management problems have also compounded the already difficult task facing the agency in meeting the pesticides registration deadlines imposed by the Congress. Twenty years after Congress directed EPA to reregister older pesticides, only 31 of the 20,000 pesticide products subject to this process have in fact been registered.

In the toxic substances control area, inadequate information resources planning and poor data management impair EPA's efforts to set priorities for assessing the risks posed by thousands of toxic chemicals to which people and the environment are exposed. For example, EPA is not effectively using data from approximately 12,000 studies submitted by manufacturers on potential health and environmental hazards from

chemicals to set its assessment priorities. It is too difficult and time-consuming for the private contractor implementing EPA's priority-setting methodology to identify and retrieve these data or ascertain their quality. While the Toxic Substances Control Act requires EPA to design effective and efficient systems for the retrieval of toxicological data, information management deficiencies have impeded other EPA offices and government agencies from obtaining the data they need. Indications are that agencies that have a time-critical need for these unique data--to respond to food contamination incidents or evaluate chemical spills--often do not attempt to retrieve EPA's chemical toxicity data because of the cumbersome, time-consuming, and labor-intensive process required to do so.

SYSTEMIC ISSUES AFFECT AGENCYWIDE APPROACH TO INFORMATION MANAGEMENT

Our past work, and that of EPA's IG, point to underlying, systemic matters that have weakened EPA's ability to more effectively manage its information. Strategic IRM planning, which is critical to the successful management and use of IRM resources, develops and documents the direction of the information management and technology programs within the agency and specifies necessary IRM activities and resource requirements. A strategic IRM plan should describe the agency's current and long-term environment in terms of IRM, its overall mission and goals, how information investments are expected to help attain these goals, and the funding required to support the plan. In reviewing EPA's strategic IRM plan, we cannot find clear linkages among IRM investments, strategic management goals or objectives, and the agency's budget. Furthermore, information needs have not been well defined for different levels of the agency, the linkages among ongoing information initiatives are not well explained, and little consensus exists among senior managers on EPA's agencywide IRM priorities. EPA agrees that inadequate attention has been given to agencywide IRM strategic planning and has declared this a material weakness in its 1992 Federal Managers' Financial Integrity Act report.

EPA also suffers from the effects of a highly fragmented, decentralized IRM environment that lacks adequate oversight and controls. Each major office independently controls how it plans and spends its information resources and has been largely responsible for designing, building, and maintaining systems under its direct control, often with outside contractor assistance. Central oversight has been highly fragmented among four groups under two different assistant administrators without clear lines of authority established between them. As a result, enforcement of agency and governmentwide IRM guidelines and procedures has often been disregarded by program offices.

To further complicate matters, EPA uses outdated and vague IRM standards, policies, and procedures governing the design, acquisition, and use of computer resources. According to existing federal guidance, strategic direction for managing an agency's information resources must be clearly communicated to agency users. Agencywide standards for managing information and coordinating technology should reflect the fundamental principles of an agency's IRM program and support the agency's overall goals and objectives. A lack of specificity in EPA's IRM policies has contributed to numerous system-specific problems, including poor specification of users' requirements, inadequate systems software documentation, and failure to adhere to defined systems development practices.[4] The IG has also recently reported that EPA lacks adequate standards in several ADP areas, including information systems hardware and software maintenance, application software programming, and system training and documentation.[5]

EPA also lacks an established, agencywide data management program to ensure the integrity of the organization's information. Data administration is a crucial activity for effective information management. It encompasses the responsibilities for managing and maintaining the corporate data resources with respect to standardization, integrity, and sharing. Despite having drafted policy guidance for some areas, EPA does not have either (1) well defined quality assurance procedures for monitoring and improving data quality and consistency or (2) agencywide mechanisms for implementing uniform standards for data definitions and naming conventions. EPA is making progress in defining and issuing some data standards, such as its locational data policy. However, agencywide progress in implementing these standards has been slow. As a result, basic data, such as the location and identification of regulated facilities, remain inconsistent.

EPA's CORRECTIVE ACTIONS SHOW PROMISE

To its credit, EPA's Office of Administration and Resources Management (OARM) has started several initiatives in recent months designed to address key agencywide IRM problems surfaced by us and by the IG. These actions have the potential to make a real difference. First, EPA is acting to comply with existing governmentwide IRM policies and guidelines embodied in the Paperwork Reduction Act and OMB circulars.

---

[4]Environmental Enforcement: EPA Needs a Better Strategy to Manage Its Cross-Media Information (GAO/IMTEC-92-14, April 2, 1992); Pesticides: Information Systems Improvements Essential for EPA's Reregistration Efforts (GAO/IMTEC-93-5, Nov. 23, 1992).

[5]Computer Systems Integrity: EPA Must Fully Address Longstanding Information Resources Management Problems (E1NMF1-15-0032-2100641, Sept. 28, 1992).

For example, the Assistant Administrator for OARM has been formally designated as the agency's senior official for information management and chair of the IRM Steering Committee. In addition, an Oversight and Compliance Support Team has been created within the Office of Information Resources Management (OIRM) to ensure program offices develop systems in compliance with federal and EPA IRM policies, standards, and procedures. This team, with contracted assistance from the General Services Administration's Federal Systems Integration and Management Center (FEDSIM), is also reviewing and approving agencywide information processing-related procurements.

Second, EPA has begun to address its systemic IRM planning and data administration weaknesses. EPA's OIRM has initiated a project to define and implement an agencywide, strategic information management planning process. Currently, the individual program offices exercise wide discretion in conducting and implementing IRM planning. In the past, some of these offices failed to submit formal IRM plans to OIRM for review and approval. According to some senior IRM officials within EPA's major offices, agencywide IRM strategic plans have been constructed by OIRM with little input from or consultation with the program offices. A final action plan outlining the steps necessary to broaden the depth and scope of agencywide IRM planning is scheduled for completion in the next few months. To address data management problems, OIRM's Information Management/Data Administration program is focusing on establishing data management policies and standards to improve and maintain data integrity, including an effort to construct an agencywide data dictionary.[6] This group is also developing an information architecture for the agency that will better accommodate agencywide data integration.[7]

Lastly, EPA is developing specific information systems solutions intended to improve access to agencywide data and to facilitate analyses based on integrated information. These efforts are largely attempts to better accommodate needs for cross-media information. EPA's Gateway/Envirofacts data integration project is intended to enhance users' access to EPA databases through a standard software interface. At present, a data repository has been created that contains extracts from existing program systems, including the Permit Compliance System, the Toxic Release Inventory System, the Facility Identification System, and the Comprehensive Environmental Response, Compensation, and Liability Information System. EPA's OIRM is working with the Office of Water to use Gateway/Envirofacts as the test platform for its water

---

[6]A data dictionary describes all the files, programs, and elements of a database system.

[7]An information architecture defines information requirements, flow, and system interfaces, and shows how individual systems and major components fit together to form a comprehensive whole.

systems modernization. EPA is investing in the acquisition of geographic data for use with geographical information systems (GIS). EPA intends to use GIS software applications to demonstrate the effectiveness of visualizing environmental data in an integrated fashion.

FACTORS AFFECTING EPA's SUCCESS IN IMPROVING INFORMATION MANAGEMENT: SOME OBSERVATIONS

EPA's task to fundamentally improve its information management capabilities is a significant and complex one. Because its corrective actions are in their early stages, we are unable to assess their success or failure in any comprehensive manner. Nevertheless, we would like to share some general concerns that emphasize critical factors most likely to affect EPA's ability to make lasting IRM improvements.

Efforts to reexamine EPA's basic data needs and the information processing requirements associated with its responsibilities should be built into the agency's IRM reform. EPA could do much more to define and prioritize its information needs, including its goals for data integration and sharing. These information refinements, however, must be driven by a strategic "business" plan for the agency--a projection of what the agency expects to accomplish by a specified time and the activities and strategies that are needed to achieve its mission, goals and objectives. This process is essential whether or not EPA is elevated to Cabinet status, but it takes on even further meaning should the agency's scope of responsibilities be expanded or legislatively couched in fundamentally different ways.

While the designation of a senior IRM official is a positive step, we are concerned that it may be impractical for EPA's designated official to be responsible for the agency's IRM in addition to that official's many other existing responsibilities. Given the enormity of the IRM tasks to be accomplished we believe that EPA's senior IRM official should report directly to the Administrator and have no other significant duties not related to information resources management.

We also remain concerned about the extent of management commitment to agencywide IRM improvements. We believe EPA could do more to strengthen the partnership between the program offices that carry out the agency's mission and OIRM as the agency devises IRM initiatives that support and help solve its existing and evolving business challenges. In particular, we are concerned that OIRM's efforts to develop strategic information architectures and data standards may be too isolated from program office IRM planning and subsequently may not receive the program office commitment and resources needed to succeed.

Finally, we are concerned that all of EPA's IRM initiatives suffer from insufficient resources and personnel. Successfully tackling agencywide IRM initiatives of the size and complexity outlined by EPA require funding and trained personnel commensurate with the tasks. For example, agencywide responsibilities for conducting oversight and review of compliance with federal IRM guidelines and regulations, designing an information systems quality assurance process, and standardizing a systems development process has been placed on just four employees.

I would like to thank Chairman Conyers and Chairman Synar for providing me the opportunity to include this statement as part of their hearing.

RELATED GAO PRODUCTS

Environmental Protection Issues (GAO/OCG-93-16TR, Dec. 1992).

Information Management and Technology Issues (GAO/OCG-93-5TR, Dec. 1992).

Pesticides: Information Systems Improvements Essential for EPA's Reregistration Efforts (GAO/IMTEC-93-5, Nov. 23, 1992).

Information Resources Management: Initial Steps Taken But More Improvements Needed in AID's IRM Program (GAO/IMTEC-92-64, Sept. 29, 1992)

Water Pollution Monitoring: EPA's Permit Compliance System Could Be Used More Effectively (GAO/IMTEC-92-58BR, June 22, 1992)

Environmental Enforcement: EPA Needs a Better Strategy to Manage Its Cross-Media Information (GAO/IMTEC-92-14, April 2, 1992).

Waste Minimization: Major Problems of Data Reliability and Validity Identified (GAO/PEMD-92-16, Mar. 23, 1992).

Geographic Information Systems: Information on Federal Use and Coordination (GAO/IMTEC-91-72FS, Sept. 27, 1991).

Waste Minimization: EPA Data Are Severely Flawed (GAO/PEMD-91-21, Aug. 5, 1991).

Toxic Chemicals: EPA's Toxic Release Inventory Is Useful But Can Be Improved (GAO/RCED-91-121, June 27, 1991).

Hazardous Waste: Data Management Problems Delay EPA's Assessment of Minimization Efforts (GAO/RCED-91-131, June 13, 1991).

Disinfectants: Concerns Over the Integrity of EPA's Data Bases (GAO/RCED-90-232, Sept. 21, 1990).

Hazardous Waste: EPA's Generation and Management Data Need Further Improvement (GAO/PEMD-90-3, Feb. 9, 1990).

Environmental Protection Agency: Protecting Human Health and the Environment Through Improved Management (GAO/RCED-88-101, Aug. 16, 1988).

RELATED INSPECTOR GENERAL PRODUCTS

Computer Systems Integrity: EPA Must Fully Address Longstanding Information Resources Management Problems (OIG Report No. E1NMF1-15-0032-2100641, Sept. 28, 1992).

Software Integrity: EPA Needs To Strengthen General Controls Over System Software (OIG Report No. E1NMF1-15-0055-2100591, Sept. 22, 1992).

Contract Management: EPA Needs To Strengthen The Acquisition Process For ADP Support Services Contracts (OIG Report No. E1NMF1-15-0032-2100300, Mar. 31, 1992).

EPA's Management of Computer Sciences Corporation (CSC) Contract Activities (OIG Report No. E1NME1-04-0169-2100295, Mar. 31, 1992).

Special Review of EPA's Major Information Systems (OIG Report No. E1RMG1-15-0041-1400061. Sept. 30, 1991).

Inert Ingredients In Pesticides (OIG Report No. E1EPF1-05-0117-1100378, Sept. 27, 1991).

Significant Savings Possible By Increasing IBM 3090 Computer Operations Efficiency (OIG Report No. E1NMBO-15-0021-1100152, Mar. 29, 1991).

Integrated Financial Management System: Managing Implementation Of The New Accounting System (OIG Report No. E1AMFO-11-0029-1100153, Mar. 29, 1991).

Flash Report On Computer Security (OIG Flash Report, April 25, 1989).

Report on the Permit Compliance System, (OIG Report No. E1NWF8-15-0021-9100192, Feb. 15, 1989).

Needed Security Improvements over Programs and Data in the NCC ADABAS Environment (OIG Report No. E1NWF8-15-0021-9100025, Oct. 20, 1988).

(510934)

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015

or visit:

Room 1000
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000 or by using fax number (301) 258-4066.

PRINTED ON RECYCLED PAPER

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

Official Business
Penalty for Private Use $300

First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100