Office of Inspector General

Report of Review

Special Review of EPA's Information Systems Program Volume II

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March 24, 1994

Inspector General Division Conducting the Audit:	Technical Assistance Division Washington, D.C.
Region Covered:	Agencywide
Program Offices Involved:	Agencywide

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VOLUME II

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APPENDIX I

United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

September 27, 1993

Honorable John C. Martin
Inspector General
United States Environmental Protection Agency
Washington, DC 20460

Dear Mr. Martin:

Thank you for presenting such compelling testimony at our hearing on June 10, 1993. Unfortunately, your efforts have raised serious new questions about the Agency's management of the fiscal and information systems programs, compounding the previously identified problems with EPA's contract management.

Based on information you presented at our recent hearing and the body of accumulated evidence on this issue, we are requesting that your office perform a comprehensive management review of the EPA's fiscal and information systems programs with as much as specific attention on the Superfund area as is possible.

We recognize that EPA has taken some important steps in the past year to address its contract management problems. However, there has been no comparable no holds-barred, systemic management review of the fiscal and information systems programs of the Agency.

The apparent lack of credible basic management information about where Agency funds, including Superfund money, are being spent and how, and the questions raised about what the resulting accomplishments may be, go to the heart of all Agency programs including the Superfund program.

It is critical that these issues, to the extent they pertain to the Superfund program, are addressed as part of the Superfund reauthorization process over the next year. Therefore, we request that you carry out the global management reviews and report the results to us as soon as possible but no later than January 1994. We would ask that any legislative recommendations are provided to the Subcommittee no later than November 1, 1993. The subcommittee understands that to accomplish your work in this timeframe, you have asked and Agency has agreed to be a participant in your reviews.

We truly appreciate all your efforts in identifying and remedying the serious management problems at the Agency, and look forward to receiving copies of the two reports requested by this letter.

Sincerely,

Frank R. Lautenberg

Frank Lautenberg
Chairman, Subcommittee on Superfund,
Recycling, and Solid Waste Management

David Durenberger
Ranking Minority Member

United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

September 27, 1993

Ms. Carol Browner
Administrator
U.S. Environmental Protection Agency
401 M Street
Washington, DC 20540

Dear Ms. Browner:

As you are aware, the Subcommittee has had serious concerns about the Agency's management of fiscal and information systems. We have requested that the Office of the Inspector General (OIG) (letter attached) perform a comprehensive management review of EPA's fiscal and information systems with as much specific attention on the Superfund area as is possible.

Given the pace of Superfund reauthorization, it is critical that these issues are addressed over the next few months. We have consequently asked that the Inspector General (IG) provide any suggestions for legislative reform by November 1, 1993, and complete his overall review of fiscal and information management systems no later than January 1994.

In order for this to occur, it is important that the staff of the OIG receive full cooperation and participation from fiscal and information system as well as program officials during the course of the studies. This cooperation should include assistance in identifying problems and their causes as well solutions either of a management or legislative nature.

The OIG will periodically brief staff of the Subcommittee during the conduct of this work. We appreciate your staff's full involvement in assisting the IG in reviewing these critical Agency support systems.

Sincerely,

Frank R. Lautenberg
Chairman, Subcommittee on Superfund,
Recycling, and Solid Waste Management
United States Senate

David Durenberger
Ranking Minority Member

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SPECIAL IRM REVIEW - CONGRESSIONAL REQUEST
FOCUS GROUP SUMMARIES

The following transcripts of the four focus groups are provided to give the reader the complete results of the focus group discussions.

FIRST FOCUS GROUP SUMMARY

The session started with the group voting, using a simple ballot, to prioritize the previously identified problems and root causes addressed from previous reports, and to add descriptions of any other major IRM problems not on the list. The ballot was structured so that respondents would answer based on their own systems experiences. Respondents were also asked to indicate on the ballot how they used the particular information system on which they were basing their responses. The group identified four high-priority problems and identified root causes and solutions for each of them.

The Focus Group voted the following previously identified problems as the three major problems:

1. Systems don't provide credible information on the resulting accomplishments from money spent. (19 points)

2. Systems don't adequately address cross-media pollution problems. (19 points)

3. Duplicate systems have been developed. (19 points)

One new problem surfaced that was not on the list of previously identified problems.

4. Systems have low levels of utility and friendliness to regional users.

Other Problems Identified (from initial ballot)

RCRIS

System is overly complicated & difficult to use. (med)

System continually needs upgrading & rewrites. (med)

CERCLIS

CERCLIS & IFMS/FMS are not electronically linked. (high)

We track too many things and definitions are too convoluted. (med)

Purpose of system not clearly identified & kept "narrow" for national systems. (high)

Systems developed with no clear customers. (med)

Usefulness of systems for EPA regional managers. (high)

FRDS

Doesn't allow easy user access. (high)

Doesn't contain parametric data, only violations. (med)

AIRS/AFS

The different data bases don't communicate/share info well - this will have a great impact on multi-media issues if not addressed. (high)

Over all direction & policy is lost in the day-to-day operations -- need to take time to evaluate and refocus if it's required. (high)

Need to have standardized & consistent minimum data elements that are agreed to by all programs using the system. (high)

Need one identifying number to track a facility on (especially multi-media sources) -- too many different numbers used now! (high)

Stop collecting data for data sake - identify the need for & use of the data - use data for program management in decision making. (med)

IFMS/EPAYS/GICS/PPAS

Not user friendly. (high)

Don't provide info useful to regional / first-line manager. (high)

11/17/93

(EPAYS/IFMS): Systems are too difficult for a manager to use. Need easy to use data systems that provide managers info quickly.

SUMMARY

CROSS-CUTTING ROOT CAUSES: The following root causes were identified as having impact on more than one priority problem. The causes are identified to the problems by number in parentheses.

1. Program and data (IRM) staff don't work together to design useful systems, therefore no motivation exists to assure data quality. (1) (3)

2. National systems are designed to meet EPA Headquarters needs (and those of Congress), and do not meet regional needs. (1) (2)

3. National systems are media specific. (1) (3)

4. Program and data management and staff often lose sight of the philosophy/reason behind the original development of a system, i.e. the intended purpose of the data. (2) (4)

5. Automation is not always the answer. Systems are not the best place for answering all questions. If activities resulting in accomplishments are qualitative as opposed to quantitative, these would be unmeasurable in quantitative systems. (1) (2) (3) (4)

6. There is no comprehensive master plan [for IRM] and there are unrealistic expectations. (1) (2) (3) (4)

SUMMARY

GROUP DISCUSSION OF POTENTIAL SOLUTIONS: The group considered the following solutions before in depth discussions to relate solutions to root causes for the priority problems:

1. Developing a master plan for EPA information systems.

2. Setting clear expectations for systems rather than adding functionality to existing systems ad infinitum.

3. Better planning for, and culling, the set of Agency information systems.

4. Prioritizing customers and their competing needs.

5. Viewing data as timeless.

6. Addressing the mismatch between data system assumptions and congressional expectations (e.g., a "best practicable treatment" approach in legislation will never create information systems that can answer specific questions about ambient conditions at individual sites).

7. Seizing the opportunity, after NAFTA, Mexico/SEDESOL has to build good systems from the start.

8. Addressing problems with 25 FINDS numbers being assigned to the same facility under the air program.

9. Recognizing automation is not the best answer to all problems.

10. Avoiding an increase in internal regulations.

11. Creating core data elements across systems so States wouldn't have to enter duplicate data.

This discussion led to developing one particular solution: *(stakeholders forming a core committee to formulate an effective IRM 5 year plan) and brainstorming to flesh out that solution.* The group then identified and categorized solutions to the root causes.

ROOT CAUSES/SOLUTIONS
Based on Previously Identified Problems/Root Causes for IRM Problems Supplied to Participants)

PRIORITY PROBLEM #1: Systems don't provide credible information on the resulting accomplishments from money spent. (19 points)

ROOT CAUSES FOR PRIORITY PROBLEM #1:

1. EPA establishes surrogate measures (activity measures and "bean-counting" measures rather than trends/outcomes measures) to quantify program success (e.g., compliance rates, permits issued, inspections, penalties collected, "best technology applied", etc.). This, in turn, is because:

2. Data quality is less accurate for "environmental" data and is subject to many qualifiers (season, age, sex, species), which must be interpreted

3. Environmental data is expensive to collect and limited in amount, geography, year, etc.

4. Federal/state/local stakeholders who would incur the transaction costs to collect more environmental data do not think it's worth it.

5. Reports like Reilly's "Risk Based Priorities" are a better tool for relating program expenditures to environmental results (systems aren't the best place to accomplish this task).

PRIORITY PROBLEM #2: Systems don't adequately address cross-media pollution problems. (19 points)

1. "Media" based organizational structure of the Agency does not encourage system designs which address risk-based environmental problems. Furthermore, systems tend to lack common data elements (e.g., identifier numbers) which would facilitate utility across organizational lines.

2. Separate media programs don't encourage cross media communication.

3. Systems developed are local in purpose and focus on single media concerns.

5. Needs from media to media are vastly different.

6. Systems are statutorily based, not risk or problem based.

7. Too many different identifier numbers exist, not one number that is common.

8. Systems do not communicate to share common data elements.

PRIORITY PROBLEM #3. Duplicate systems have been developed. (19 Points)

1. Information must serve multiple clients with multiple needs.

   --National systems are developed by Headquarters offices to serve their needs without considering the needs of other Headquarters offices, Regions, and States
   --Headquarters and Regional managers have different data needs
   --State programs require more and different information and detail
   --Too little interaction exists by Regions at National level

2. National systems are too complex.

   --Systems are overly complicated and too difficult for

managers or staff to use
--Systems cannot produce needed regional reports, therefore Regions develop report writers
--System development or revision is difficult and takes too long to obtain national consensus, therefore people develop their own
--Developers with no environmental program knowledge develop systems that are not useful to the Programs they should serve, therefore people develop their own

3. There is no comprehensive Agency or national program office planning for system development or identifying future needs.

--There is no master plan or life cycle management of systems
--There is no agreement on standard Agency-level data fields
--Headquarters uses end of year money for unnecessary new system enhancement
--Program is unwilling to resolve mainframe versus PC based debate, so they decide to do both

4. Existing systems are inflexible and cannot be easily adapted to meet changing needs.

--canned reports only provide information valuable to Headquarters or Congress
--new system developed contains almost the same information
--data fields are not always normalized between systems requiring some overlap or duplication, eg. the FRDS system doesn't address all needs of users (states) because the system carries only violation indicators not parametric values
--developers fail to step back and refocus to correct the direction; instead a new system is developed

PRIORITY PROBLEM #4. Systems have low levels of utility and friendliness to regional users.

ROOT CAUSES FOR PRIORITY PROBLEM #4.

1. EPA's national systems are written in obsolete database mgmt software. This obsolete software (Focus, ADABAS, S2K, Clipper, etc.) makes it impossible or too expensive to create user-friendly systems. No amount of user identification and user participation in the development process can change this.

2. There is a need to better identify "who" the system must be friendly/useful for.

3. The "user" group has changed over time to include everyone with a PC on their desk.

4. Costs are high to make systems user-friendly.

5. Program staff and data staff have not worked together on what's needed and what's to be done with what's been collected.

6. We lose sight of the philosophy and reason behind the original development of the system, and along with it, the intention of how the data are to be used.

7. The systems become cluttered with add-on activities.

8. National requirements (for Congress) are not the same as regional requirements

9. We rely too much on contractors and work with artificial deadlines.

SOLUTIONS: The group believed the first two of the following solutions would have a large impact in addressing EPA's IRM problems discussed during the two days. For those two solutions, the group did a force-field analysis (looking at pros and cons) of implementing those solutions:

1. Formulate an IRM 5-year plan by having stakeholders (Administrator, Assistant Administrators, regional media program managers and staff, state and local representatives) form a core committee to:

   a) conduct viability study of existing systems (to keep, revise, or pull them).

   b) identify the future direction of data use and data management.

   c) make hard decisions, prioritizing competing customer needs (not just attempting to please all customers).

   d) examine whether it would be cost-effective to pursue a core data concept for the Agency, i.e., relational data concept.

   e) examine and answer the following questions [for national systems]:

      i) what is the decision that can/will be made from this data/system?

ii) what level of data is necessary to provide basis for the decision?
iii) is it necessary for this data to reside in a national database system?
iv) are the data "timeless"?
v) are the customers transient and can we say "no" to their needs?

FORCE-FIELD ANALYSIS FOR SOLUTION 1

PRO

- there is a legislative mandate to do so
- it aligns with a multimedia approach
- it is an opposing force against individuals who try to make the data systems work rather than question the usefulness of the system
- it would simplify identification of facilities and sources
- it would reduce the data reporting burden on businesses, states, and locals
- it provides for a broad-based approach to determine expectations and goals of what the system is to do
- Administrator would need to designate a "team" with a very succinct mission and tight schedule
- if the cost of maintaining current systems is factored in with the cost of duplicate data entry, the up front costs would be worth the long term benefit

CON

- bureaucratic intransigence to change
- senior managers don't have attention span to provide meaningful involvement and direction
- attempting to reach consensus on core elements may make it difficult to define what is really "core"
- AAs may be territorial or resistant
- little historical interest by EPA top managers to information management issues

2. Enhance electronic transferability of core national data, so that regions can develop their own modular front end data systems (interfaces to the data) to meet regional data needs.

FORCE-FIELD ANALYSIS FOR SOLUTION 2

PRO

- if the cost of maintaining current systems is factored in with cost of duplicate entry at various levels, the up-front costs of this new "core system" may be worth the long-term benefit.
- this would eliminate many disputes between HQ and regions and among regions selecting "important" data fields
- front-end programming expertise is developed at regions, not by transient HQ contractors
- the necessary technology is now available and affordable
- this would reduce time and cost in developing new national systems
- regional users would get what they want every time
- NPR culture would empower lower levels (regions) to take the lead in meeting their own needs (there may be 10 different front-end systems)

- this would make the use of data easier
- there would be regional mgmt consensus behind this idea
- supports multi-media enforcement
- speeds up development of enforcement cases and comparison of statistics and trends

CON

- entrenched NCC bureaucracy doesn't want to relinquish turf to regions
- some regions have no front-end developing capability, and training costs are high to acquire expertise
- need for HQ "uniformity" make it hard to let go of front end systems
- current national system managers will be resistant to change
- HQ offices would have to "give up" some control. The territorial instinct in HQ is strong
- some individuals (programmers, data system managers) will continue to try to make the existing systems work rather than question the systems

OTHER SOLUTIONS

3. Implementation of HR 3425, which will establish a Chief Info Officer and a Steering Committee at a high level

4. Look to the National Performance Review for recommendations for how EPA can be better organized to address environmental risks, i.e. address barriers we have within media

5. EPA should pay for systems management costs incurred by States, to improve data quality (but decision to do this should be done on a system-by-system basis to ensure cost-effectiveness)

6. Design specifications committees/workgroups must include regional representation at the workgroup leadership level. They must also include state/local reps if the systems are to be used by them, or if they will provide data to the systems.

7. HQ traditionally has had the lead on developing systems. Shift the lead and contractor control to the region(s) chosen by national consensus to be the lead.

8. Use a bottom-up approach rather than a top down development approach for selected systems.

9. In the absence of a large committee/global approach, establish clear expectations for each system by asking:
   a) what is the decision that can/will be made from this data/system?
   b) what level of data is necessary to provide basis for the decision?

c) is it necessary for this data to reside in a national database system?
d) are the data "timeless"?
e) are the customers transient and can we say "no" to their needs?

SECOND FOCUS GROUP SUMMARY

PRIORITY PROBLEMS

1) Exclusion of information management from regulation and guidance development. Lack of ownership of information in EPA systems by program people (What information do we need to run our programs). (Success is defined by getting a regulation "out the door").

and

Lack of understanding or participation by upper management (Office Director and above) in information resources management. Information management programs are not treated as core function or critical to EPA environmental protection.

(23 Pts.)

2) Lack of consistent Agency architecture (hardware, software, data), strategy and lack of power to enforce it. No consolidated approach to EDI. [Indirectly trying to enforce it through budget]. (13 Pts.)

3) Lack of centralized data administration function in Agency (also none within program offices). (11 Pts.)

4) Un-implementable policies, standards, and guidance. (They are basically "OK", but there is not power to enforce and often can not afford it). (10 Pts.)

5) Too much dependency on contractors and inadequate in-house IRM technical expertise. (9 Pts.)

6) Lack of defined IRM infrastructure, communication within infrastructure, and common understanding of roles and responsibilities (how infrastructure works). (Read about Lotus Notes as an Agency standard in "Government Computer News")

Unwarranted complexity of getting work assignments through existing contracts (takes too long to get something through contracts). (6 Pts. each)

7) EPA does not view information as a valuable tool to empower the "public" (local environmental groups, researchers, labor, industry) to deal with environmental problems beyond what the government can do. (3 Pts.)

8) Budget (realities) process precludes long-range, strategic planning.

Lack of effective use of "life-cycle planning process" and understanding of this by management (needs to be in more understandable language).

State-of-the-art computer equipment out of reach (availability on Agency contracts lags and budgetary constraints).

Data integrity problems with EPA's mission critical systems.

GROUP COMMENTS: Data usually developed for principle users, not secondary users. Source of data is from States/often voluntary. However, EPA is accountable. EPA dependent on others (trust) for data (because of statutes). Often there is a Federal/State difference in interpretation because delegated programs are not exact or precise. Because of priorities and limited resources we are working in a continuum. Upper management tends to "hang on" to numbers (which are not real-time and constantly changing). States want regulatory flexibility making it difficult to aggregate data (esp. on a delegated responsibility). This allows inconsistencies. There is also an interrelationships of problems. Public access may be mandated but we do not understand costs (how much and what is the effectiveness/benefits) and have not determined if it is even appropriate in many cases. Secondary user often does not want to take the time to understand the data. Example Chesapeake Bay program's "Chessie System" - there are negligible number of users but a large amount of money was spent which may have been better spent on cleaning the environment.

(2 Pts. each)

9) No defined career paths for information management specialists similar to that developed for scientists in EPA.

Development of duplicate systems.

GROUP COMMENTS: This is a problem. OW example is a Congressional add-on to report on contaminant sediments caused creation of an emergency data base because of a mandated date. A system was in development which could have provided the data but would have taken longer to complete. How many systems store sample data? Need to put price tag ***($ threshold)*** on what is major system. We never "kill" old systems. Often contractors get to know the systems, have access to them and market them to other offices, perpetuating duplication. RACF has helped RCRIS by preventing contractor access. Probably a problem, esp. with

tracking systems and with other Federal agencies. OW example - USGS, NOAA (NCPDI gets data from PCS). Even though they may cooperate, nobody gives up systems because they may lose funding. Seven states have their own NPDES system because they say their systems are integrated. In-house systems - Management wants up-to-date information (real-time) and begins to create own systems. However, they often use information that is not ready for release but use it anyway. Management often will not let us ***(give us time)*** do it right but there is always time to do it again. Often there are spin-off systems (LANs) because people do not like the platform (mainframes). There is no standard architecture and programs allowed to do it. No one has power to say no.

(1 Pt. each)

No Votes

10) Lack of credible basic management information about where Agency funds, including Superfund, are being spent and how, and the resulting accomplishments (previously identified problem).

GROUP COMMENTS: Can not account for adequacy of dollars spent (i.e., how do you know you are spending dollars on the right thing. Need to measure results on environment and how systems support that. Not an issue in some programs (OSW/OPPT). Systems managers and SIRMOs do not play heavily in budget process. Congress often asks questions from different people and do not get the same answers because of different perspectives of respondents (Congressional staffs go to various sources and often protocol for QA responses is not followed in agency). A problem of communication, lack of screening responses and is a vulnerability leading to problems in credibility. Everyone views "accomplishments" differently (different customers/users). Congress may ask "Are waters cleaner?", but systems were not designed to answer that.

11) Difficulties in identifying cross media pollution problems (previously identified problem).

GROUP COMMENTS: This is a program definition/data definition problem. Often asking questions of systems that they were not designed to answer. No one ***(upper management)*** can say no! Maybe need to look at Congress as a customer and ask what it is they need. No strong leadership at the top (esp. in IRM). Never received questions regarding integration. Maybe this is an access problem. Often

Congress does not understand complexity of the environment. Statutes and regulations often conflict and systems are expected to perform this function. Agency is compartmentalized. Because subject areas ***(media)*** are so different would most users understand the data? Maybe we are selling users short on abilities to understand data.

12) Significant cost overruns and delays in developing information systems (previously identified problem).

GROUP COMMENTS: ***The group consensus was that this was a result of other problems not a problem in and of itself.*** Budgets and statutes continually change. However, it also happens in systems development regardless (has there been a system that hasn't?). Inadequate staff and dependence on contractors are problems. Sometimes Congress never provided enough money to begin with. Regulations and guidance are written with no thought of the impact on information systems. You have the same problems ***(i.e. result - cost overruns/delays)*** in implementing programs. There is also game playing. Sometimes systems are not a line item in a budget. It would be better if they were.

13) Exposure of systems to unnecessary risks (access and other) (rewording of previously identified problem - "Exposure of Agency's financial payment systems to unnecessary access risks").

GROUP COMMENTS: This is a problem for systems ***(as reworded)***. Exposure of systems to unnecessary risks.

SECOND FOCUS GROUP
ROOT CAUSES AND SOLUTIONS

PROBLEM: Lack of understanding or participation by upper management (Office Director and above) in information resources management. Information management programs are not treated as core function or critical to EPA environmental protection. Exclusion of information management from regulation and guidance development. Lack of ownership of information in EPA systems by program people (What information do we need to run our programs). (Success is defined by getting a regulation "out the door").

ROOT CAUSES:

* Senior management does not understand linkage between information systems and accomplishing the mission.

* Senior management does not understand role of data in framing options in the decision-making process (Data loses its identity).

* Upper management (Office Directors and above and Branch Chiefs in Regions) are accountable for things other than IRM, i.e., program mission, and do not pay attention to IRM unless they can see a return.

* Designations of IRM functions not reflected in performance standards and functions are not empowered (responsibility without authority). (Function examples: System managers, information management coordinator, PC site coordinator (PCSC), LAN Administrator/LAN Manager, SIRMO, RACF Administrator, Account Manager, Records Managers, Telecommunications Contacts, ADP Coordinators, ADP Training Coordinator, EMail Coordinator, Contracts Management, etc.)

* Too much turnover at the highest management levels which does not support long-term investment in IRM - working for short term results to improve resumes for next job.

* Lack of insulation from "political winds".

* Management does not understand IRM (in terms of costs, logistics, and resources).

* Upper management "grew up" in an era that did not use information systems for decision-making and is not comfortable linking benefits of information systems to decision-making.

* EPA does not recognize long range investment/benefit of information - too many new initiatives (initiative of the month syndrome), play budget games, cut base budgets.

* Inadequate communication of IRM issues among upper management. (Example: RACF and its effects of implementation). Issues go to lowest level. Selection process of contactees on IRM communications is faulty.

* Organizational location of IRM function(s) misplaced in the Agency and program offices. (Sometimes functions within Division and can only service that division).

* NDPD physically remote/lack of communication and understanding of programmatic IRM needs.

COMMENTS: One participant indicated remote location had nothing to do with poor communication or understanding, however, another participant indicated lack of travel money impacted the ability of NDPD to be present at meetings in which they should be represented.

* No long-term strategy for tying IRM to Agency mission. Management by Committee - Too many committees, lack of coordination between committees, no consideration of impacts on information management and the other committees' work and the effects they are having. Committees have no authority to make decisions (i.e., State Capacity). Too much consensus building.

* Lack of budget, planning and resource (staffing) stability in IRM.

* Agency is not a stable steward of information.

* Capabilities of computers ***(technology)*** are often oversold - management does not understand support that is necessary ***to develop and maintain systems*** and what can or can not be done with computers. Some managers may be proponents of computers but never use them..

* Undefined process for making IRM decisions in the Agency.

* Program Managers make decisions without assessing impacts or consulting OIRM/NDPD.

* NDPD and OIRM make unilateral decisions without consulting about or assessing impacts on customers. Lack of effective communication plan and obtaining information from user community for strategic planning

* No follow-through on IRM decisions.

OTHER COMMENTS: Some participants indicated that several years ago the SIRMOs met, formed a group and provided solutions to OIRM/NDPD but there was no follow-through by OARM. SIRMO group eventually disbanded.

SOLUTIONS:

* Create Assistant Administrator for IRM (Corporate Information Officer - CIO) that reports to Administrator with no ancillary responsibilities other than IRM (including IRM strategic planning). Must have responsibility, authority and expertise. ***(There was***

discussion on whether this should be a career position and the need for someone to be a political appointee to ensure adequate power was voiced).

* Administrator should hold AA's accountable and responsible for IRM effectiveness (able to devote resources).

* Revise or restructure IRM in Agency (including giving SIRMOs more authority). Need a fresh view.

* Develop a consistent IRM structure (functions and responsibilities) in program offices and have consistent treatment of regional and headquarters IRM functions.

* Define IRM functional responsibilities and accountability.

* IRM functional positions need to be filled with qualified people.

* OARM/IRM and programs needs to hire staff with IRM and programmatic knowledge or obtain expertise through rotations, details, etc.

* Provide training in IRM functions.

* Educate senior management on roles and responsibilities in IRM.

* IRM Community must improve communication with senior management (use less jargon).

* Develop IRM strategic plan tied to mission.

* Any major IRM initiatives, standards, etc. that are developed or changed need to go through green border review process with cost/benefit analysis.

* OARM (OIRM/NDPD) need to be customer oriented.

* Establish working capital fund for IRM (tie budget cycle to system life-cycle).

* AA's need to be part of focus group with no delegation of attendance.

* Establish process for incorporating IRM in regulation development and guidance.

PROBLEM: Lack of consistent Agency architecture (hardware, software, data), strategy and lack of power to enforce it. No consolidated approach to EDI. [Indirectly trying to enforce it through budget].

ROOT CAUSES:

* No IRM leadership or direction (via plans) and no enforcement. Program offices go out on their own because there is no leadership.

* EPA can not respond effectively to rapidly developing technology.

* The EPA procurement process stinks (ineffective and cumbersome). Procurement drives hardware, software, etc. ***(not architecture based on user needs)***. Lack of sufficient ADP procurement expertise in OAM.

* Too much contractor input (at NDPD) on architecture.

* The people making architectural decisions (NDPD) do not understand how computers (technology) are used in the Agency or by the States/local governments (not paying attention to customer's needs).

* No consideration of needs in exchange of data/information in architectural decision-making process (technology for technology's sake).

  GROUP COMMENT: NDPD held a meeting last summer to address architectural issues ***(only one participant knew of the meeting)***. Only two systems managers were invited from HQ. The rest were IRM Branch Chiefs and contractors. The group remarked that no results have been seen from this effort.

* NDPD does not talk/listen to customers.

* No mechanism for determining Agency standards or making changes to existing architectures.

* Lack of data standards and the ability to implement or enforce them.

* No common data definitions, especially through the legislation/regulations.

* Current "stovepipe" standards, regulations, and management inhibit standardization. Some special purpose (vs. corporate) data is OK.

* SIRMO's have no power to ensure that standards are enforced (offices avoid getting their signatures).

* Resources (money) not available to implement standards (i.e., locational data policy).

* Items in the budget dealing with data standards are the first ones cut.

* No consideration of data as a corporate resource; responding to stovepipe statutes.

* NDPD/OIRM do not view themselves as a corporate resource for data and training. NDPD offers no training for mainframe packages (Statistical Analysis System (SAS), etc.). They do not view themselves as responsible for this corporate resource.

GROUP COMMENT: Several individuals did point out that NDPD has WIC training but no one shows up. There is no management ***(programmatic management)*** commitment for IRM training.

SOLUTIONS:

* Develop an implementation plan for EDI in the Agency (not written by OPPE).

* Develop a legal policy for EDI signatures for external Agency entities.

* Develop a process for determining what is corporate data vs. special purpose data resulting in an enforceable "corporate data" policy.

* Establish a "data czar" who reports directly to the Administrator.

* Maintain relational reference tables (such as zip codes, county FIP codes, etc.) as a corporate data resource.

* Ensure that there are sufficient resources in the budget to implement standards.

* Require red or green border review (as appropriate) on Agency standards (both new and revised), including a cost/benefit analysis and an analysis of impacts on the users and IRM community.

* Exercise Agency discretionary authority in implementing IG and GAO audit recommendations.

* Undertake a comprehensive review of the Agency's architectures (both data and technology).

* Undertake a comprehensive review of how the Agency spends its approx. $260 million annual IRM budget (agency-wide IRM program budget).

* Review and evaluate ADP procurement process (both large and small purchases) to facilitate purchasing, increase electronic commerce, and look for better models in other agencies to emulate. Need to do this at two levels - work to improve on issues outside the Agency via National Performance Review and also issues internal to the Agency.

THIRD FOCUS GROUP SUMMARY

SUMMARY SOLUTIONS

At the completion of the focus group exercise, the group was asked to develop five broad solutions based on the detailed solutions presented by the group in response to specific problems. The following broad solutions were presented by the group.

1) The components of an information system (e.g., requirements, needs, etc.) need to be identified and agreed to up front. ***There was general agreement that failure to identify and agree to information system requirements up front results in failure of the system to meet perceived needs later in the life cycle.***

2) Need to better anticipate needs by better communications with customer (i.e., Congress and oversight agencies). Planning needs to take place in a cooperative non-adversarial environment.

3) There is a need for more resources. There is a need to consider all resource requirements before designing information systems. Resource requirements must then be prioritized and compared to available resources. Priorities may then be addressed with available resources. ***There was concern that systems are implemented at the Regional level without funding the resource requirements (unfunded liabilities) needed to operate the systems (i.e., data entry, system maintenance, etc.).***

4) Longer term stability of information systems is needed.

5) User input to information systems development is critical. ***There was general consensus that better communication with users is necessary to anticipate needs. In addition, the group generally agreed that better communication would lend itself to building a cooperative atmosphere and better commitment for data input and data quality.***

REACTIONS TO IDENTIFIED PROBLEMS

(Based on Previously Identified Problems/Root Causes for IRM Problems Supplied to Participants)

The session started with the group discussing the previously identified problems and root causes addressed from previous audits and reports. The following were not viewed as Regional problems, however some of them were discussed in the comments below:

PROBLEM: Difficulties in addressing cross-media pollution problems. (Primarily a Superfund focus group and not felt to be a Superfund issue).

PROBLEM: Development of duplicate systems.

PROBLEM: Exposure of financial payment systems to unnecessary access risks.

COMMENTS ON IDENTIFIED PROBLEMS
Many of these comments have bearing on the problem of cost overruns and delays in development. Many were carried over to specifically identified problem discussions.

PROBLEM: Lack of credible basic management information about where Agency funds, including Superfund money, are being spent and how, and the resulting accomplishments.

1. There is a lack of linkage between how funds are spent and accomplishments.

2. We do have "credible" management systems, but if questions coming from the Hill change, we may not have the answers in the data - Resource Limited.

3. Many of this summer's questions appeared to be directed at Superfund reauthorization - Is Superfund fair? ***(And may not be recurring questions).***

4. Constantly changing focus/changing questions - i.e., Environmental justice -- there has been no data/information collected on that in past.

5. Sometimes by the time questions are answered there is no longer need for answers. Congress ***(and senior management)*** needs to understand the impact of asking questions (resource and $ costs).

6. IFMS/CERCLIS still not linked - Not a Regional problem but National systems problem. However, Region would benefit from integrated system.

PROBLEM: Difficulties in addressing cross-media pollution problems.

1. Superfund does not play in multi-media enforcement - not amenable because addressing past actions. Region has used GIS successfully for multi-media issues however. Region targeted major facilities for RCRA,

air, water - most generally OK. Small facilities generally don't have multi-media problems.

2. Cross-media integration not an issue in Superfund. We collect multi-media data for site. Some data never need to be stored in database, question of where to store it (i.e,., different media specific databases). Mostly deal with program accomplishment reporting. Does Congress want an organic emphasis on reporting? Reporting structure is to different Committees/Sub-committees for different laws (i.e., specific program elements).

3. Planning horizon short (because of budget processes/politics), a longer planning horizon would allow for more stability. Also differences in program focus over time have occurred (technology vs. risk).

4. Congressional Sub-committee setup not encouraging multi-media activities. Have to report on specific program elements. Strategic planning can't work (tried in one Region but failed) because resources tied to legislation and there is an inability to move resources to where they are needed (Superfund resources can't go to water or vice versa).

5. Funds are program specific and not used for multi-media tracking system, therefore can not report if there is no activity. Does this include environmental data? Typically EPA's tracking & info. systems do not.

6. Superfund collects multi-media data, but its relative impact is small (dealing with localized problems). So much planning goes into remedial actions that collateral impacts are generally not issues.

7. Sub-committee chairmen need to coordinate with each other.

PROBLEM: Data integrity problems with EPA's mission-critical information systems.

1. Need user friendly, self-feeding systems (worry about data quality). Have problems - reasons not always apparent. EPA sometimes pushing IRM technology limits - causes delays, etc. Major reason for cost overruns last year because of loss of TOSS (loss of contract personnel - prematurely - knew contract was going away).

2. Data accuracy/quality concern in future years. Gaps in budget formulation cause problems. Data element definitions change, systems do not handle anomalies. Happens as technology changes (mainframe replaced by PCs).

3. No traceability between Regional budget submissions and final budgets (after negotiations, etc.). SCAP data elements constantly changing - no data comparability from year-to-year - source of data quality problems (related to Congress?).

PROBLEM: Development of duplicate systems

1. Systems developed by Headquarters not useful to Region - therefore Region develops own applications.

2. Changes to mainframe system happen slowly, need to supplement with PC systems.

3. Need to define what are common data elements (relate to reporting needs) and which ones aren't (therefore allow for variability in individual's needs). [Relates also to data integrity problem].

PRIORITIZED PROBLEMS

Problems are presented in priority order based upon the multi-voting scores given to each problem by the focus group participants. Scores, presented as total points received, are provided in parentheses following each problem.

1) Most information systems are designed for centralized Headquarters management and are not useful to the Regions. Systems need to be designed as tools for staff, not merely to answer questions (although they may do this). (25 points)

2) EPA does not do a good enough job of anticipating questions from Congress. (23 points)

3) EPA receives data of questionable quality from the States. ***This was of particular concern because EPA receives most of their data from the States.*** (14 points)

4) Congressional Committee structure. (13 points)

5) Data definitions. (10 points)

6) Linkage between financial system and program systems (e.g., IFMS and CERCLIS). (9 points)

7) Need information systems that recognize the uniqueness of issues. Too many customers (i.e., management, Congress, States, public, etc.) are asking different questions. (8 points)

8) Congress needs to revisit the Agency mission to give more flexibility to programs. ***There is a continual fight for resources.*** (5 points)

9) Overemphasis on contract support versus in-house support. This is applicable to all Agency functions, not just IRM. (4 points)

10) Need to develop information system with more flexibility so they can respond to changing needs. Inflexible systems lead to data integrity problems. There is no clear expectation or common understanding of what is desired from information systems. (3 points)

11) Cost overruns. (0 points)

12) Need to take out negativism. (0 points)

ROOT CAUSES/SOLUTIONS

PRIORITY PROBLEM #1: Most information systems are designed for centralized Headquarters management and are not useful to Regions. Systems need to be designed as tools for the staff, not to answer questions (although they may do this).

ROOT CAUSES FOR PRIORITY PROBLEM #1: ***Root causes for priority problem #1 are presented in priority order as determined by group multi-voting. Scores, presented as total points received, are provided in parentheses following each root cause.***

1. Centralized management systems are designed by Headquarters for their needs. (41 points)

2. Misinformation from OIG, GAO, OMB. ***What appears in audit reports and studies is often not an accurate representation of the condition.*** (23 points)

3. Data system developers do not understand program or staff needs. Part of this problem may be related to the fact that contractors (versus Agency personnel) develop most of our information systems. (21 points)

4. Information systems are used for different uses than originally intended. For example, the HWDMS system was originally designed as a tracking system. However, the Agency tried to use as management system. (16 points)

5. Complex vs. simple information systems - need vs. effort. ***There is a need for information at different levels (e.g., public, field offices, Congress, management, etc.) and different requirements (i.e., effort, cost, motivation) for obtaining and maintaining data/information at these levels. A data quality problem exists when Regional resources are required to collect information to meet Headquarters needs when perceived benefit and/or resources are not provided.*** (14 points)

The following additional root causes were identified for priority problem #1. However, because of our desire to address more of the prioritized problems, we did not spend focus group efforts on developing solutions for these root causes.

6. Information systems development has been reactive (versus proactive) to Congressional needs. (9 points)

7. There are too many managers and too few staff in Headquarters. (6 points)

8. Information systems are used by data managers to build empires. (0 points)

SOLUTIONS: *Solutions are identified to the problems by number in parentheses for clarity. Subsequent sessions were not specific.*

1. The people who are designing information systems need to understand what is needed. (1)

2. Consultation must take place between Regional and Headquarters personnel. (1)

3. Need to determine if other Federal agencies have information systems we can use. (1)

4. Information system designers should be required to function as a Regional project manager. (1)

5. Need pilots and ground truthing (like that used with the RP2M program). (1)

6. Need to tie into existing information systems - close the loops. (1)

7. Information systems need to allow flexibility for the Regions. (1)

8. Headquarters needs to listen to the Regions and vice versa. (1)

9. Headquarters needs to be more consistent in providing either FTEs or contractor dollars to maintain and perform data input into information systems. (1)

10. We need to identify what we truly need ***up front***. (1)

11. We need to anticipate ***future*** IRM needs ***(data and information)***. (1)

12. Information systems needs to stop being all things to all people. (1)

13. Need more experienced auditors (particularly experience in program areas). (2)

14. More regional involvement in audits. (2)

15. Auditors need to discuss resources as they influence outcomes. Auditors need to analyze if program operations are doing the best they can with given resources, instead of auditing against a standard that assumes adequate resources. (2)

16. Audits need to identify positives. (2)

17. Regions need a second opportunity to review reports before final reports are issued. (2)

18. OIG, GAO, OMB should care if information reported in the audit (results of audit) are correct. (2)

19. Auditors need to follow the 1988 GAO audit guidance. (2)

20. Programs should be less defensive and admit when there are problems. (2)

21. Both sides need to be more objective in the spirit of Total Quality Management. (2)

22. Programs need to do a better job responding to audit reports (both draft/final). (2)

23. Need more in-house staff for certain development functions. (3)

24. Information system developers need to listen to end users. (4)

25. Information system developers need to understand needs. (4)

26. Adequate resources need to be provided. (4)

27. Programs need to admit when a new information system is needed, instead of trying to operate with a system that no longer works (ex. CERCLIS is broken beyond repair, nested loops in CERCLIS keep growing). (4)

28. Need to recognize that we need to have different information systems to do different things. It is not always necessary to combine all the satisfaction of all needs into one system. Decisions of this nature need to be discussed and resolved at a high level of management. (4)

29. Don't assume you need an integrated information system. (4)

30. Feed information as needed. (4)

31. People making decision regarding IRM issues should have a background in computers. (5)

32. Determine if one information system is needed (versus multiple systems). (5)

33. Scrap old information systems when necessary (CERCLIS). (5)

34. Design information systems properly. (5)

35. Assess cost of fulfilling data needs. (5)

36. Decision makers need to have background in ADP (should not have to rely on contractor's technical expertise). The Agency needs in-house expertise. (5)

37. Need long-term planning (high turnover change). (5)

38. Decision should be made at Program level (by those persons committing resources) in concert with the Administrator, GAO, and OMB. (5)

PRIORITY PROBLEM #2: Problems anticipating Congressional questions.

ROOT CAUSES FOR PRIORITY PROBLEM #2: ***Root causes for priority problem #2 are presented in priority order as determined by group multi-voting. Scores, presented as total points received, are provided in parentheses following each root cause.***

1. The Agency is in a reactive mode. (43 points)
2. Poor communication with Congress. (39 points)
3. Too many hidden and/or different agendas. (28 points)
4. Too busy. (8 points)
5. No marketing plan for customer. (6 points)
6. Changing Congressmen/Congresswomen and changing interest. (4 points)
7. Congress is not interested until it is time to get votes. (2 points)
8. Have to think like Congress (anticipate congressional needs). ***The group was not sure if this was a realistic expectation.*** (0 points)
9. Don't debate diaries. (0 points)

SOLUTIONS:

1. More ongoing communication with Congress (borderline lobbying).
2. Decide up front what data EPA needs in order to manage, then be consistent (need long term stability).
3. Programs need to be proactive in asking Congress what they want to know.
4. Congress needs to be to be more specific regarding what they want (i.e., "specifics" vs. "general inquiries"). This level of specificity needs to take place throughout the information systems development life cycle.
5. Meetings between EPA and Congress should be attended by higher level people. Subcommittee attendance at Regional EPA briefings has been poor.

6. Need to focus more on IG, GAO, etc. (i.e., the ones who are raising the issues - misinformation). Need to work on relationship with these groups and need to work with an open mind.

PRIORITY PROBLEM #3: Concern for quality of data from States (most data comes from States).

ROOT CAUSES FOR PRIORITY PROBLEM #3: ***Root causes for priority problem #3 are presented in the order in which they were presented by the group. Because of our desire to address more priority problems, we did not attempt to prioritize root causes for this or subsequent problems.***

1. State personnel are not clear on what data to input or how to input data.

2. There is a general lack of resources (e.g., people, equipment, computer systems linkups, procurement system, etc.).

3. EPA always seems to want more data or changes the data that it needs.

4. Information systems developers do not involve States in system design, even though States provide most of the data. ***According the group, reductions in Headquarters eliminated State involvement during data element definition development.***

5. There is no National or Regional consistency. This results in States entering data under different pretenses.

6. Do we have good data quality audit reports?

7. Need to emphasize to States the benefits of using the information systems we provide. ***The group believes that the States will be better motivated if they recognize a benefit.***

8. No way to enforce data quality at the State level.

SOLUTIONS:

1. Need more resources.

2. Better define what EPA needs are. ***This will help get "buy-in" from States, distinguish between EPA and State needs, and provide specifics that States could***

implement in their own systems to pass information to EPA.

3. Need to have State involvement in information system design.

4. Need to allow States more flexibility in tailoring information systems. We may be able to provide resources for State information systems while identifying core data requirements for EPA systems.

5. Assure we have good ***data*** audit reports. Need to conduct audit work at the time of information system design.

6. States need EPA assistance in the procurement of equipment.

7. States need to receive more ***and continual*** training on information systems. States have high turnover.

8. Headquarters needs to establish a hotline for data definitions and information. This will support National consistency.

9. Need to determine if we can use the grants process to apply leverage to the States ***or determine if there is another mechanism to provide money to States while ensuring that data meets EPA needs.***

PRIORITY PROBLEM #4: Congressional Committee structure.

The participants in the focus group agreed that this problem, although valid, was not a problem for which we could brainstorm a solution. Therefore, the group choose not to address this problem.

PRIORITY PROBLEM #5: Data definitions.

ROOT CAUSES FOR PRIORITY PROBLEM #5: ***Root causes for priority problem #5 are presented in the order in which they were presented by the group. Because of our desire to address more priority problems, we did not attempt to prioritize root causes for this problem.***

1. There is a continual change in the definitions of programmatic outputs.

2. There is a redundancy in terms (i.e., a fine line between definitions). ***The group believes that there is***

a lack of understanding of definitions between some constituents (e.g., EPA Programs and others such as the Inspector General and Congress).

3. There is no common understanding of definitions.

4. There is a false assumption that Superfund sites have common traits. ***The group expressed that each Superfund site has unique characteristics which make "national" definitions or standardization difficult.***

SOLUTIONS:

1. Common agreement on definitions from the constituencies (e.g., Congress, IG, GAO, OMB, Headquarters) need to be made.

2. Definitions need to be frozen for a period of time.

3. Definitions need to be revisited on a regular basis.

PRIORITY PROBLEM #6: There is no linkage between financial systems and program systems. ***The group used the IFMS and CERCLIS systems to discuss this problem.***

ROOT CAUSES FOR PRIORITY PROBLEM #6: ***Root causes for priority problem #6 are presented in the order in which they were presented by the group. Because of our desire to address more priority problems, we did not attempt to prioritize root causes for this problem.***

1. Built as independent systems to deal with individual problems

2. No common goals

3. Incompatible formats

4. Did not consider financial data when designing CERCLIS

5. Too difficult to bring together

6. No resources to link

7. Inadequate preplanning

8. Needs changed ***over time***- accountability more priority over tracking.

SOLUTIONS:

1. Up front communications, planning

2. Consider all directions you can go ***(for development)***- CERCLIS/Finance/Contracts (diversity of users)

3. Anticipate future needs

4. Do not build one big system, use modules that will be easier to change

5. Need own technically competent people to build (govt. function - primarily design to be able to communicate during development)

FOURTH FOCUS GROUP SUMMARY

PROBLEMS IDENTIFIED

1. Systems were not designed to do what they are currently asked to do, and an unwillingness to be forthright about it. For example, few of our data bases interact. (52 Votes)

2. Data quality is not known. There is no comparability mechanism to determine whether data supporting EPA's mission-critical information systems is accurate or inaccurate. (29 Votes)

3. Difficulties in addressing cross-media pollution problems. (7 Votes)

4. Significant cost overruns and delays in developing and implementing information systems. (7 Votes)

5. Development of duplicate systems. (3 Votes)

ROOT CAUSES (LIMITED TO TOP 2 PROBLEM AREAS)

Problem 1

Systems were not designed to do what they are currently asked to do, and an unwillingness to be forthright about it. For example, few of our data bases interact.

Root Causes for Problem 1

1. Lack of an "Information Systems Champion" and accountability for information systems:

   -- Lack of top management understanding of the importance of information systems to the mission; attention to information systems activities; and commitment to supporting information systems.

   -- Top management officials not accountable for information systems management.

   -- Senior Management does not understand the strategic value of IRM.

   -- Lack of knowledgeable, experienced, and forceful leadership in the IRM arena.

   -- Lack of commitment to enforce standards.

2. Inadequate planning and budgeting process for information systems:

-- Lack of a overall Agency business plan with long range goals, objectives, approaches to meet goals and objectives, and associated costs.

-- Budget cycle not consistent with technology development activities. System development projects are not line item budget items--funding comes from program areas. When program budgets get cut, the system development projects suffer. For example, Integrated Contract Management System (ICMS) was a 5-year project and is currently floundering due to program budget cuts.

  o Management lacks staying power in the budget process.
  o Inconsistent funding.
  o Support services are the first item to go.

-- Administration, Congressional, and EPA top management turnover change policies and priorities of information systems management.

-- Management unwilling to redo big systems when information requirements change.

-- Changes in technology overcome information systems--systems become obsolete.

-- Technology becomes dated with delays.

-- Computer support not tied into performance measurement (i.e., success/accomplishments/economic benefit).

-- Technology activities not tied to mission.

-- Difficulty in using raw data for meaningful reports.

-- Lack of an overall Agency business plan which ties budget with IRM needs.

-- Limited resources invested by OIRM in planning, policy, and oversight.

-- End users are not being considered in developing and maintaining information systems. The role of States is not being recognized. Systems are not user friendly.

3. Lack of built-in flexibility and integration of Agency information systems.

   -- No Agency requirements for multi-media approach to pollution prevention and enforcement. For example: 2 States are moving away from a single medium approach for pollution prevention. One State is integrating information regarding the air, water, and permit activities of the top 400 facilities.

   -- No centralized standardization of data elements

   -- Limited initiatives supporting data integration/management. Good examples are the Integrated Task Force Monitoring (NOAA, EPA, and USGS); GIIS (DOD, DOT, EPA) involving the standardization of analytical data definitions on Superfund Federal facilities; and the Global Position System.

   -- Lack of consistent data dictionaries (e.g., multiple data dictionaries for common data elements with different data definitions).

   -- Lack of system development standards.

4. Unrealistic expectations for information from Agency information systems.

   -- EPA is seen as being on the cutting edge of technology, which is not true. This raises false expectations for EPA in the eyes of Congress, States, and employees.

   -- Management is not forthright with top management and Congress regarding the inability of our current systems to support current requirements.

      o Even when requirements are well-defined in the beginning (e.g., RCRIS-$millions to define requirements; best example of collaborative effort with States and other users to define requirements) new requirements may be difficult to implement and result in complaints of not meeting user needs.

   -- Extreme difficulties are encountered in projecting expectations for information.

5. End users not adequately consulted.

   -- Difficult to identify and communicate information

system projects with all customers with vested interest to get their involvement and contribution.

-- EPA is not recognizing the role of the States in implementing and maintaining information systems.

6. Insufficient qualified information system personnel staffing due to budget and personnel policy constraints is not competitive with the private sector.

Recommendations for Problem 1

1. Establish an information systems "Champion" (i.e,, Chief Information Officer) as a separate Assistant Administrator position (or equivalent). The person selected to this position must have good management, agency background, and technical qualifications. This person must be bold enough and skillful to describe the lack of systems capabilities when appropriate. This position requires access to the Administrator and requisite power and authority to execute its responsibilities. We recommend that the Administrator look to the private sector for a model and/or recruitment.

2. Develop an overall Agency business plan with long range goals, objectives, approaches to meet goals and objectives, and associated costs. Business plan should include high level costs including a line item for information systems. The Chief Information Officer needs to be involved in this process.

3. Clearly define Agency-wide information systems needs. Identify information systems requirements needed to meet the Agency's missions. These needs should reflect the requirements of the end users. Key customers should be involved in this process.

4. Develop a strategic information systems plan which includes detailed costs. Identify tasks to be completed annually with the funds.

5. The strategic information systems plan should assure that systems are flexible enough to deal with changing program needs and changing technology.

6. Update Agency-wide information systems requirements and the strategic information systems plan annually with associated costs of changes. Factor in technology changes.

7. Information systems "Champion" must represent the strategic plan implementation in the budget.

8. Develop personnel systems that allow recruiting and adequately compensating people for jobs they do, rather than for their credentials.

Problem 2

Data quality is not known. There is no comparability mechanism to determine whether data supporting EPA's mission-critical information systems is accurate or inaccurate. (29 Votes)

Root Causes for Problem 2

1. Lack of focus and attention to data administration/ management.

   -- Most data administration/management related activity is on a system by system basis as opposed to an Agency-wide basis.

   -- No data audit process by programs exists to ensure that data elements/definitions within individual systems is consistent.

2. Changes in data definitions by Headquarters program offices on a year to year basis. (e.g., CERCLIS--changed definition of remedial investigation/facility study (RI/FS) for Federal facilities in 1993).

3. Differences in interpretation of data definitions between offices (e.g., site definitions).

4. Changing legislation and requirements.

   -- New laws and regulations come out every year which require changes to systems which are not funded. Systems can't keep up with the changes because of lack of funding and delays due getting contracts in place.

   -- For example: The Agency's inability to make required changes to the CERCLIS Accomplishment Report for 1993 due to contract problems and delays.

   Lack of resources and priority for data administration/ management.

   -- When budget cuts occur, ADP support services is one of the first things to go, which reduces system maintenance.

5. Complexity of design of systems.

   -- Program systems so large and complex that ADP and program knowledge is required to use the systems.

   -- Systems are not user friendly.

   -- Difficult to keep up with changing systems.

   -- For example: PCS information is updated by the States through interfaces with related States systems. Any changes to PCS affects the States systems and interfaces.

   -- Even report writer software is too complex.

6. Users of information not educated as to the capabilities and contents of the systems (e.g., IFMS/CERCLIS, IFMS/DOCKET).

7. Lack of adequate training in some cases.

   -- Changes in systems and constant turnover of personnel require annual training.

8. Lack of interface between IFMS and CERCLIS (i.e., CERCLIS obligation data not updated from IFMS).

   -- System design problems in both systems preclude easy interface.

9. Technical personnel gathering data have little or not vested interested in data gathered in some cases (e.g., CERCLIS).

Recommendations for Problem 2

1. Data management must be considered as a "core" program rather than a secondary function within each program with the same weight as other program functions.

2. Senior management (i.e., Administrator) must be educated as to the strategic importance of systems/data and of the impact of programmatic changes to systems.

3. Establish management and staff accountability for data (i.e., ownership of systems and data).

4. Trade information systems contractor support for more FTEs. (Contractors have no vested interest in information systems).

5. Provide more funds, people, equipment, and software for data administration and management.

6. Increase Regional involvement in legislation/rule making process. Regions have a better understanding of the impacts.

7. Redesign systems to allow easier adaptation to change, and control by Regions.

8. Allow Regions more control over their aspects of systems.

9. Change budget process to establish direct budget line items for information systems activities in order to reflect accountability for resource allocation for information systems and Regional portion of that allocation.

10. Survey Regions and Headquarters to determine the actual level of resources expended for data management and systems support.

11. Simplify the contracting process to avoid delays and to quickly respond to changing requirements. For example: (a) 4-6 months to execute a delivery order on an existing contract; (b) 9 months to get an 8A contract in place; (c) 2-3 years to get an IRM contract in place is unacceptable.

12. Allocate more information systems FTEs to the regions.

13. Establish Agency-wide directories of systems and data (information).

14. Educate the users of the information from systems (not system users) on the capabilities, contents, and limitations of the information systems.

15. Develop standard data definitions across information systems with common data elements.

APPENDIX V

SUMMARIES OF INTERVIEWS

BACKGROUND: This Appendix presents the transcripts of the series of interviews conducted on special emphasis areas (such as data integration) and with particular people--two Regional SIRMOs. The transcripts are detailed narratives of the meetings.

SUMMARY OF HEADQUARTERS INTERVIEW
SUBJECT: DATA INTEGRATION

PROBLEMS IDENTIFIED

1. EPA is deficient in the area of data integration (DI):

   - internal links among EPA mainframe systems are not there
   - external links to other agencies, states, etc. are not there

There is no unified user interface in the area of performance indicators, environmental quality, other data fields.

2. EPA staff cannot always get information they need and they have, over time, stopped asking many important questions because we simply don't have the data to provide the answer or can't get it out of the systems we have. Decisions based on limited amounts of information becomes a general course of business. This practice is then defined as the acceptable level.

For Example:

RCRIS/CERCLIS -- Reconciliation is difficult between RCRIS/CERCLIS and permit writing is constrained by information availability. Its difficult for Superfund and RCRA systems to answer questions asked now. Five and a half years ago different questions were asked. Systems were not designed for the questions being asked now. It is not possible to anticipate the types of questions that will be asked.

PCS -- Provides a pointed set of information on standards versus discharges but doesn't bring in wetlands, population impacts, ecosystems, proximity (of contamination) to the well supply.

GICS -- Congressional questions originally asked, are no longer asked because information is not available.

GIS -- Programs resist because data is entered into separate systems. GIS users showed management that the system had incorrect data that showed Superfund facilities in the middle of the Atlantic Ocean and at the North Pole.

STORET cannot show how much contamination is coming out into a body of water.

3. There is a pervasive perception that EPA information systems have no data integrity. Information systems have primary and secondary users. The primary use of Agency data is successful, i.e., CERCLIS helps SCAP preparers provide good data to Headquarters staff using it. The problem in DI is secondary use. While primary users of CERCLIS have the information they need, secondary users seeking the following information will not find answers through CERCLIS: what is the nature of the hazard; is it a PCP site; where is the hazard located, what is the degree of the threat posed by certain chemicals, and sites, etc. are not successful because this information was not included in the system requirements during development. This creates the perception that data are bad--even when the system works for the primary user. The problem surfaces especially when the Congress and others attempt to select information the system never collected and never intended to provide.

ROOT CAUSES

1. Systems independently designed and managed lack both EPA and Government-wide data standards in many areas such as organisms, naming conventions, data architecture. Without standards system managers will continually be putting bad, unintelligible information into employee's personal computers.
   TQM may provide correction, however the competent people involved are not tuned in to the protection of the environment. The culture doesn't foster meaningful discussions to determine commonality, instead each have their own life, no common vision.

2. EPA has not thought strategically. The Agency culture does not value data: it is of no use; its importance is minimized. There is parochial focus on data, even down to ecosystem level. Data/information are not considered strategic resources. IRM is considered an overhead activity rather than a key element of EPA business for the purpose of enforcement and monitoring. Too much impetus behind current system development has been on bean counting: how many permits, inspections, enforcement activities, not the environmental data needed by users.

3. The statutory framework promulgated by Congress doesn't address cross media. Program managers are driven by a single Act, a requirement for reporting on activities. Statutes compartmentalize and drive the Agency in that direction, mandating bean counting rather than real environmental results and DI. This orients managers toward

collecting specific information. EPA has not addressed this problem as other agencies have successfully. EPA was not aggressive in writing regulations to facilitate integration. There is very little movement afoot to go in a integrated direction like TRIS and GIS. Five years ago resources to support GIS were pulled from all over. Five FTE's were identified from each Region. The outcry was such that resources were pulled back from GIS. The Agency lacks resources and funding for FTEs which increased its dependence on contractors.

The DI problem is not unique. USDA historically had the problem...everyone is under the gun to meet daily operational needs...there is no slack to look at the big picture. USDA has been successful because they have less dependence on contractors.

4. Administrations don't emphasize IRM: Nineteen teams were assembled to conduct the National Performance Review at EPA. None addressed information management as the keystone -- strategic importance in the plan. Pollution Prevention is addressed but the importance of IRM was missed. This continues the pattern -- neglect IRM. The OE reorganization is not emphasizing DI as one of the objectives.

5. It is still acceptable not to integrate data--there was no penalty to be paid for not wanting integrated permits...it was, however, not acceptable not to meet the mission or not to bean count or not to get out the permits. Systems were built to do specific things and are still doing them. The data quality questions are highlighted but no harm came to EPA.

   EPA missed an opportunity to move forward on DI. TRIS, an Information Program ordered by Congress, is hailed as one of EPA's successes, yet the Agency hasn't expanded lessons learned here to other systems. STORET has only 500 users while it should have 5000 users. Office of Water is taking solid looks for providing for secondary users and seeking standards for water data.

6. Information systems have primary and secondary users. If a system under development for a primary user has no need for latitude and longitude data, it is not collected. Nobody can enforce other programs to meet needs of another office where the one office does not control the resources of the other. Current trends of demographics analysis that deal with population at risk now need boundary data and latitude

and longitude. At present, some Agency information systems are required to provide geographical location. The Agency still has not defined its business in terms of latitude and longitude of information. There is risk involved (resource and technical risks) to projects for incorporating integration to other projects. Program managers believe, "If I have to alter my plans to handshake with you I introduce increased resources and risk; I won't do this unless someone makes me." There is no requirement for programs to consider secondary uses during systems development. People may or may not be rewarded for extra risk and effort, therefore programs usually avoid the risk by ignoring DI.

RECOMMENDATIONS

1. Top management needs to mandate DI to enable EPA to:

   - better assess risk and target areas needing action
   - implement a risk ranking program to provide a systematic method to compare threats, and rank and evaluate how we are doing against threats
   - measure outcomes
   - meet the Administrator's 4 priorities which cut across all media:

     o Ecosystem protection

     o Pollution Prevention

     o Environmental Justice/Equity

     o Partnership building

   - revise the Agency culture such that people can and will work together more on DI projects by encouraging developers to consider other office's needs

   - recognize that DI takes resources, creates risks, that may complicate one office's systems development/operation efforts

   - integrate DI requirements into the day-to-day business, i.e., enforce environmental equity into the process by mandating the equity requirement be met before issuing permits

2. Elevate OIRM in the organization. Establish a data administration center, central group for DI, and a CIO--a strong General Patton type with status/stature/authority. Solving the problem is a matter of the vision and will of top management to:

   - Build sound IRM processes in the Programs
   - Build strong IRM programs in the Program areas
   - Put the existing resources and logistics to work under strong leadership
   - Develop and enforce data standards

3. Sound thinking about IRM needs to be built into the thinking of program personnel--raise the strategic role of information in protecting the environment:

   - Consider an alternative to the IRM steering Committee --high level managers don't deal with issues
   - Program officials on the Committee should have more at stake
   - Assistant Administrators don't know ADP/IRM lower level issues. They don't have authority over it either.
   - EPA should follow the path taken by FAA, Patent and Trademark, NWS, SEC: view information as a core business line; institute a major modernization effort. Revisit lessons learned during one of EPA's major efforts in ORD and OW, EMAP and STORET modernization; determine if a link exists between systems.

4. Link in to the data highway bandwagon and open all non-CBI, non-enforcement sensitive, non-privacy act information to the public

   - would identify data quality problems
   - would require move toward continuous improvement in data quality by making EPA more accountable for data quality (can we do it without creating fear within EPA?) provide TQM amnesty--line it up so that data managers will not suffer repercussions. Be prepared for chaos.
   - would create greater demand for DI
   - ensure the customer knows where to go for information--set up an 800 number

5. Create consistency, standards and naming conventions. This is the critical path to success. Review the case in point, TOXIC loadings model -- the Great Lakes Project -- which is dealing with multiple data standards, for example, how much chlorine loadings?

(Also important is the) Institutional ability to use DI. Do the users have the ability to ask the questions that force DI? What are the questions that demand DI in order to be answered and who's asking them? The public's naive questions require DI. (How are we achieving) ecosystem protection data/pollution prevention data/where are the integrators. We have no background, no experience.

SUMMARY OF HEADQUARTERS INTERVIEW
SUBJECT: OFFICE OF AIR AND RADIATION

PROBLEMS AND ROOT CAUSES

LACK OF CREDIBLE BASIC MANAGEMENT INFORMATION ABOUT WHERE AGENCY FUNDS, INCLUDING SUPERFUND MONEY, ARE BEING SPENT AND HOW, AND THE RESULTING ACCOMPLISHMENTS

This previously identified problem is not considered an issue in the AIRS program. It was felt that they have a "complete financial structure" and can identify where funds go, how they are distributed, and what they are used for. This is possible because the entire AIRS system budget is contained in one Branch budget.

DIFFICULTIES IN ADDRESSING CROSS-MEDIA POLLUTION PROBLEMS

"Root causes" preventing information integration include both programmatic and philosophical issues. An example of a programmatic difficulty is related to the "lack of support" that FINDS receives. This lack of support has resulted in programs being reluctant to participate in the program and a "lack of trust" by the programs. Although the FINDS program is a good idea, OIRM is "dropping the ball" by not properly supporting it.

Philosophical differences are related to the different "power groups" outside the Agency (i.e., OAR/NOAA & OW/COE/USFWS/USGS) involved in the process. The fact that there is not a lot of commonality between programs leads to serious difficulties in cross-media integration. The recently reorganized Office of Enforcement will have a hard time addressing cross-media enforcement issues because of the lack of commonality between programs. There is also a lack of compatibility between programs.

Recent budget cuts are significantly setting back long-term efforts at data integration.

SIGNIFICANT COST OVERRUNS AND DELAYS IN DEVELOPING AND IMPLEMENTING INFORMATION SYSTEMS

They did not believe that cost overruns and delays are necessarily problems (in the AIRS program). Cost overruns are of a continuing nature and are necessary because information systems continually need modification. For example, they recently received $300,000 for IRM support to implement new requirements

related to the Clean Air Act authorization (caused expansion in users, requirements, etc.).

Lack of centralized, unified data management guidance is resulting in Regions and States "going their own way." Additionally, Agency programmatic managers have not "bitten the bullet" on identifying what information will be needed to run programs in the future. This has resulted in no base budget being established to develop the information systems necessary to support future program operations. Small policy decisions can change systems in a significant way.

There is no base budget to maintain software. As a result, 50% budget cuts translate to putting developed systems on the shelf.

DATA INTEGRITY PROBLEMS WITH EPA'S MISSION-CRITICAL INFORMATION SYSTEMS

Data integrity problems stem from the fact that there is no consensus on who needs what information. For example, some Regions rely totally upon the States to provide information while other Regions do not. Additionally, managing the quality of data received from the States is a problem. Data quality standards are not always established and if they are established they are not enforced. There is an inconsistency in data quality standards. For example, the Agency was not able to force the State of California to enter zip code information into the AIRS system because they are not convinced that the information is correct. Instead, the State enters XXXXX for the zip code.

DEVELOPMENT OF DUPLICATE SYSTEMS

There is a belief that use of the mainframe is the best way for EPA to do business. However, there is tremendous pressure on the programs to develop PC-based systems. For example, Region 4 has developed their own PC-based AIRS system for use in the Region and the States within the Region. This system was developed because Region 4 did not like AIRS (they found it hard to use). Duplication exists because systems are developed in a Regional office to meet a specific need and then are given to other offices or States for use because systems. These systems are then viewed as "Agency" systems without any Agency endorsement. They believed that a formal process would not help the situation but only add another layer of bureaucracy.

Nationally, many State systems duplicate EPA systems and this duplication causes problems. These systems are often not

integrated. It may be impractical to "force" one system (ex. AIRS) on everybody, but data standards would certainly help. AIRS is working with the ANSI standards committee to develop national standards. The problem will likely get worse because of increasing demands for information (ex. recent new Clean Air Act requirements). The problem is further aggravated by the current push against centralization and the push to empower States and local governments and reduce oversight (i.e., NPR). The reorganization of the OE and movement of the air enforcement function to OE may lead to further fragmentation over time (as has happened with permit systems). In addition, "Title V" forces have created a need for more systems and more money to be provided to the States.

One of the participants is chairman of an OAQPM data management workgroup (task force) and the workgroup will produce an "action oriented paper" around April 1994 addressing data management issues. The document is part of a long-term plan with the Department of Defense to identify similar systems to combine and integrate data. The ability to integrate has been impaired by recent budget cuts.

EXPOSURE OF AGENCY'S FINANCIAL PAYMENT SYSTEMS TO UNNECESSARY ACCESS RISKS

This issue is not believed to be a problem in the AIRS program.

ADDITIONAL PROBLEMS

One problem they have been dealing with for some time (twenty-plus years) was the problem of data confidentiality. There are cases in which data requirements are promulgated by EPA and States refuse to provide the data because the data is considered confidential by State statute and not confidential (i.e., subject to FOIA requests) by Federal statute. One participant has been unable to get the Attorney General and Office of General Counsel to make a determination as to the confidentiality of some data in these cases. In addition, there are different standards of confidentiality for industry and States resulting in data integrity problems (certain data is not reported). In addition, vulnerability problems sometimes arise when the level of security for particular data varies between pieces of legislation.

A problem area in hardware and software compatibility is related to the direction the Agency is taking technologically. It is felt that with the new client-server technology, NDPD/OIRM

has not established a new hardware/software direction for the Agency. Hardware standards are not being built and national priorities are not being established (e.g., future telecommunications needs). User's needs are not being solicited.

OARM's consideration of cutting one of two NDPD mainframes in response to FY94 budget cuts would be "catastrophic for States" and EPA would "lose a customer base we'll never regain". NDPD used to roll out new equipment all the time but that real future planning by one of the NDPD branches stopped 2 - 3 years ago. It was also felt that user funding (fee for service) isn't really the answer because (1) the program's budgets don't have money to pay for the services in the first place, and (2) the program's budgets are also being cut. User funding would be very disruptive in the short run.

The State/EPA Data Management program (SEDM) was felt to be an excellent program in which State and EPA personnel (at the working level) were able to work together on small multi-media types of projects. The participants in this project were very enthusiastic about the work being done and the project facilitated good communication between the Agency and States. They believed this program was cut last year (beginning of FY93) because of budget cuts.

It was observed that States use AIRS in one of two ways, directly or indirectly. Direct users input data into AIRS and extract data from AIRS for their own use. Indirect users input data into AIRS because they are required to provide the data, but do not extract data from the system and feel this is an onerous request. When Regional officials support a system like AIRS, the States in that Region are more likely to cooperate than when the Regional office does not support a system (States are more likely to go their own way).

ORGANIZATIONAL ACCOUNTABILITY

Senior management recognizes the data collection function but does not always recognize this function as a component of the broad data management process.

They believe there have been problems resulting from the termination of the TOSS contract. The termination of TOSS has lead to the dispersion of system development activities and this has resulted in less standardization. They feel the MOSES contract is not a popular development vehicle because although it can be used to develop a system, the programs cannot use it the support the system.

OIRM showcasing products, introducing tools, and providing models in the past was appreciated. There is concern that there will be a shift, on OIRM's part, toward enforcement and away from support.

One organization has had problems getting personal computers off the Agency contract. Some PCs have been on order for "over a year." The problem seems to be that NDPD does not get the support they need from OAM. Another office felt that buying equipment off the contract does not result in paying the lowest prices for the equipment. They "get laughed at" when they buy equipment at such high prices.

Regarding the FMFIA process, it was felt that material weaknesses have no relationship to resources. For example, one office can be performing alright with few resources and have a need for additional resources while another office can have a lot of resources, report a material weakness, and get additional resources. In fact, reporting an issue as a material weakness often results in additional resources (i.e., failure breeds success).

PLANNING AND RESOURCES

They believed that OIRM's policy development process does not always get all programs' input and buy-in, creating a "lose-lose" situation. Currently, programs are not plugged into this process.

IRM functions are currently taking a double cut in budget cutbacks. For example, program cutbacks result in cuts to available program IRM resources in addition to cuts in OARM, resulting in cuts to available non-program IRM resources on which the programs depend. The programs have very little say in OARM discretionary budget cuts even though these cuts directly affect program operations. The program office has dealt with severe cuts for the past two years. Part of the problem is related to a lack of understanding, by the programs, of the non-discretionary portion of OARM's budget.

Communication does not always follow a proper process and procedures nor is there awareness of sensitivities. For example, members of an audit team met with AIRS representatives to discuss AIRS system maintenance. However, communication problems in the OAR chain-of-command resulted in the audit team taking some time to identify the correct group of people to interview. It was felt that OIRM does not always keep programs adequately aware of upcoming responsibilities. For example, the office received a

notice stating that a certain system security plan was due. They noted that they had little warning that the plan was due and pointed out that the memo (re: installation security) did not identify, or give guidance on, specific security issues to be addressed (i.e., PC security or data security).

Too many SIRMOs are part-time. OAR does not have the resources to staff the SIRMO position full-time. OSWER was used as an example of a better way to staff a SIRMO function.

The Agency is not adequately planning and funding information systems. There is a feeling that the Agency is behind in the client/server environment and there isn't enough "muscle" in the hardware "architecture." Some efforts have been made to examine the direction the Agency should take. Part of the problem is that IRM does not get much visibility.

DATA INTEGRATION/DATA MANAGEMENT

FINDS is a great idea that has "not hit the mark." Some problems exist with the reliability of the data maintained by FINDS. For example, some States refuse to use the EPA ID (assigned by FINDS) as a primary identifier (although that was an original intention) because of data quality problems. It was believed that Regions/system owners need incentives to clean up data. The Agency cannot implement policy and then "walk away." They felt that this is happening with the locational policy. Apparently, several States are not willing to commit to implementing this policy and nobody in EPA Headquarters is forcing it. They believed there are many complicated issues involved with the FINDS program but that the whole process is further complicated because of the lack of continuity within the FINDS program. It was pointed out that FINDS promotes linkage rather than integration. In addition, policies are not enforced through Grants or by giving technology to States for free provided States put resources into these projects. The fundamental issues of what data is needed in National Air repository both now and in the future have not been addressed.

QUALITY ASSURANCE AND PROTECTION OF DATA

Quality assurance was looked at during the FMFIA process and a data quality plan is being developed. However, the level of budget cuts is making things difficult. There are some weaknesses. For example, emissions (air) does not have data quality objectives or plans but needs to develop them. However, Clean Air Act amendments have caused an overload and many things are not getting done. There has been a fairly steady erosion in

maintaining quality in data that is being collected. Quality assurance "falls by the wayside" when other requirements (ex. court-ordered deadlines or top management's "hot" initiatives) are a higher priority.

COMMUNICATION

It was felt that OIRM does not clearly identify and state priorities, communicate these to everyone, provide training, or solicit input on the effects of their efforts. It was felt that OIRM loses credibility when they ask for information and never follow up.

SOLUTIONS

SIGNIFICANT COST OVERRUNS AND DELAYS IN DEVELOPING AND IMPLEMENTING INFORMATION SYSTEMS

The Agency needs centralized, unified data management guidance promulgated by Headquarters.

Need national consistency in data (ex. emission inventory).

DATA INTEGRITY PROBLEMS WITH EPA'S MISSION-CRITICAL INFORMATION SYSTEMS

Data quality standards need to be enforced.

DEVELOPMENT OF DUPLICATE SYSTEMS

OIRM needs to explore the issue of duplicative systems and "official" Agency endorsement of systems for use by other offices and States to accomplish program missions (without adding bureaucratic layers).

Establish data standards for national systems for use by States in designing systems.

ADDITIONAL PROBLEMS

OIRM should establish a Bulletin Board System (BBS) to provide advice on purchasing hardware and software to help solve compatibility problems.

Looking into the future in terms of planning and providing long-term commitment and stability to major national systems was emphasized as being very important.

Bring back the (SEDM) program.

ORGANIZATIONAL ACCOUNTABILITY

The Senior IRM Steering Committee should move from an advisory role to a decision making role and have strong technical subcommittees providing input and advice to senior decision making personnel.

Senior management needs to buy into the data management process (including the data collection activity). There needs to be a data management plan which would address needs from today to 5 or 10 years out.

It is "critical" that top management (political appointees) understand and approve of data collection/systems development efforts. Programs need to "close the loop" with senior management on data requirements (need top level concurrence) and that commitment must be received up front. "Don't create another bureaucracy". Senior management buy-in needs to be informational (i.e., understanding and agreement) versus "getting a signature in the right blank." Senior management should share accountability based on buy-in but buy-in need not be "memorialized" in the form of a document. Another "paperwork exercise" is not needed.

The SIRMOs should act as a "clearinghouse of information" across their programs. In this capacity, the SIRMOs would be in a position to reduce the duplication of information systems. OIRM should have a "fostering" role in systems development projects. Helplines could be used to support development activities. It is "impossible" for OIRM to track development activities and a lot of development work is being missed.

There needs to be better communication with the procurement office, Office of Acquisition Management (OAM), NDPD, and the program offices related to buying equipment off Agency contracts.

PLANNING AND RESOURCES

OIRM needs to get programs together and agree on policies and standards.

Better communication needs to be established within the Agency concerning IRM matters. Communication needs to follow a proper process and procedures and be aware of sensitivities.

Move toward integrating PCs and mainframes in a client/server environment to help the Agency "catch up" in the IRM arena. The Agency needs a centralized organization (NDPD) to take the lead to make this happen.

EPA needs to "put some muscle" into the hardware architecture. There needs to be better centralized leadership to address common technical problems not "what are you doing in AIRS."

DATA INTEGRATION/DATA MANAGEMENT

Develop incentives for Regions/system owners to clean up data in FINDS.

OIRM needs to foster importance of policy through better policy guidance.

A National Air repository is needed and the fundamental issues of what data is needed both now and in the future need to be addressed. A long term plan needs to be developed.

QUALITY ASSURANCE AND PROTECTION OF DATA

Emissions (air) needs to develop data quality objectives or plans. To accomplish this, they need the full support of senior management (Deputy Assistant Administrator (DAA) accountability).

COMMUNICATION

OIRM's priorities need to be clearly stated and communicated to everyone. In addition, OIRM's role needs to be more facilitating, showcasing, and helping not just compliance. OIRM needs to ask if their efforts are helping. They need to identify priorities and provide training.

OTHER COMMENTS

This was the "first time in 20 years anybody asked us these questions" and we are very pleased to have been included in the review.

SUMMARY OF HEADQUARTERS INTERVIEW
SUBJECT: SYSTEM DEVELOPMENT CENTER

PROBLEMS AND ROOT CAUSES

MANAGEMENT CONTROL

* Change of people (turnover of Contract Officers (COs) and Project Officers (POs)) hasn't helped. Has led to inconsistencies on EPA's side.

DIFFICULTIES IN ADDRESSING CROSS-MEDIA POLLUTION PROBLEMS.

* Agency not created "holistically."
* When Agency not organized "holistically" info. and data can not be. There have been efforts to improve/combine data but unless EPA is organized "holistically" EPA cannot adequately address this.
* System Development Center (SDC) not hearing a need for this. Only need for this (from big picture) is in the mind of top management.
* Continues to be problems in complexity and difficulties in interpreting data (ex. Superfund can not agree on what a site is).
* Difficulties in trying to add structure to things that may not be able to be structured.
* GATEWAY/ENVIROFACTS info. is not designed to be "meaningful" when viewed together. Have not looked at public needs.

ORGANIZATIONAL ACCOUNTABILITY

* SDC sees spotty SIRMO involvement (weak link - pressures from other organizational roles they have).
* Most Delivery Order Project Officers (DOPOs) need to be prodded for performance measures in DOs.
* Programs had some problems factoring some areas such as product assurance into their process.

PLANNING AND RESOURCES

* High turnover of CO's/PO's (MOSES).
* Expertise of DOPOs mixed (not consistent). Hard to get all expertise in one DOPO.
* Hard to get away from treating on-site contractors as staff.
* Frequent conflict - pressure to get something done vs. doing it right.

* Lack of knowledge of implications of this pressure and balance of requirements vs. good IRM on staffing.
* Info. gathering in regulations not involved enough with IRM.
* No consistency from year-to-year for IRM involvement up front.

QUALITY ASSURANCE AND DATA PROTECTION

* Inadequate systems documentation on systems coming into SDC, hard to maintain, don't always know what changes will affect.
* Can not always get back to sources.
* SDC process forces policies, but there is a limit to what can be enforced when no funds are available.

SYSTEMS DEVELOPMENT LIFE-CYCLE

* Most systems need constant enhancement, mostly because of regulation changes (change in information needs).
* There is an unwillingness to do some things that are policies (i.e., documentation, life-cycle planning).

COMMUNICATION

* DOPOs without background in IRM not knowledgeable or want to avoid it. OSWER people generally aware of IRM guidance.
* IRM management not "plugged in" or not strong enough to deal with Steering Committee.
* Re: Policy, Procedures, Standards - Some programs are good, some bad.

<u>SOLUTIONS, IMPROVEMENTS, AND ACCOMPLISHMENTS</u>

MANAGEMENT CONTROL

* MOSES process was designed to improve SDLC
* Management structure (both in SAIC contractor and EPA) developed to oversee work in SDC helps ensure things are done right (i.e., EPA oversight in development of project plan through negotiation and revision of project plan).
* Audits have made a difference on program side. IG reports have gotten program office management's attention. Program offices trying to change including more management control (esp. in RCRIS) and IRM decision making. Superfund is also improving/Govt. approves all changes - due in part to structure/management of contract (forces controlled change). Have reviews of projects once per month focussing on schedule/technical issues.

PRODUCT ASSURANCE

* Product assurance on each project (including configuration management and software QA) has paid off, although there have been complaints on added cost.
* Provides better control over changes. Contractor now provides recommendations, but EPA meets with all principles and agree on changes.
* Getting better at prioritizing changes and selecting those that can be implemented within budget. Better handle on where money is spent.

DATA MANAGEMENT

* This summer's Superfund data collection was a success because of central consolidation of data management in SDC.

DIFFICULTIES IN ADDRESSING CROSS-MEDIA POLLUTION PROBLEMS

* GATEWAY/ENVIROFACTS is a step toward pulling together data/info. that exists. May be a front end to public access. Pulling data from different systems points out differences.
* Part of GATEWAY/ENVIROFACTS is also an effort to standardize data elements through data modeling to see what data is there.

SIGNIFICANT COST OVERRUNS AND DELAYS IN DEVELOPING AND IMPLEMENTING INFORMATION SYSTEMS

* MOSES process is trying to preclude this by planning and through development of a good project plan up front.
* However, MOSES is not dealing with entire Agency (only Water/OSWER/some ORD - big programs). No acid rain work. Regions do their own thing.

DATA INTEGRITY PROBLEMS WITH EPA'S MISSION-CRITICAL INFORMATION SYSTEMS/DATA MANAGEMENT

* Data integrity rests more with programmatic area.
* RCRIS - States are putting more resources into data integrity.
* PWSS - States anticipating needs to have data integrity because they are involved in process.
* Currently doing data management at SDC.
* Working towards a better data definition standards in IMDA.
* Efficiency & quality improvements have been noted by SDC centralization. A 40% reduction accrued when geographically

separated functions (i.e., hotline problems and software maintenance/development) were moved to a central location (same system with geographically separated functions when functions needed close communication--RCRIS).
* CERCLIS also becoming centralized.
* You get cross fertilization of experiences between different systems when co-located.
* OERR has benefitted from sharing data when moved to same location as other OSWER systems.

DEVELOPMENT OF DUPLICATE SYSTEMS

* SDC set up to try and avoid this through its process.

EXPOSURE OF AGENCY'S FINANCIAL PAYMENT SYSTEMS TO UNNECESSARY ACCESS RISKS

* No financial systems in SDC other than IFMS which is an evolving picture.

ORGANIZATIONAL ACCOUNTABILITY

* Documentation approvals seen at higher levels (OSWER, OW, OAR). Other offices are improving.
* Need an IRM organization (centralized) budget to support Agency. NDPD is the only unifying force via architecture.
* Contractor estimation process records changes and effort in projects for better estimates in future.
* Use of IEF (Computer Aided Software Engineering ((CASE) tool) helps identify performance measures.
* Govt. side of SDC providing better guidance for IGCE adding product assurance to cost estimation items (product assurance mandatory).

PLANNING AND RESOURCES

* No sign that qualifications & training getting worse (not necessarily getting better either).
* Meetings conducted to educate DOPOs on SDC process.
* Would like to see more OIRM/IMDA participation in process.
* SDC has self-discipline with its existing structure - i.e., separate facility, "off-site" meetings, etc. therefore no day-to-day direction.
* SDC setup forces better planning.
* Certain things (functions) should be government function.
* If resources are not available, reduce what is being done or reduce requirements to be met.

* More emphasis on IRM, skills, life-cycle training, support, and continue to make sure DOPOs understand contract issues.
* Need programmatic pressure to make projects better.
* Need mechanism to address requirements in time period vs. violation of good IRM.
* IRM needs to get "plugged in" to Congress/bills.
* When Congress does "how to" legislation, EPA/IRM needs to be involved or they should not be so specific.
* Need better OMB interface on information collection forms, complete with time frames and implications on systems.
* Need to identify system life but technology mainly the driver in system life, plus NDPD support of technology (80286 computers are still being supported).
* EPA needs FTEs to do certain functions such as LAN support on-site.

QUALITY ASSURANCE AND DATA PROTECTION

* As work is done on "inherited" systems (existing systems coming into the SDC), documentation improves. All new releases are well documented.
* Data standards are being used when applicable and adhered to.
* Contractor personnel have signed confidentiality statements.
* Risk analysis being done more frequently by program offices and are also done during development.
* SDC supporting Agency security program.
* Considering adding cost for security as mandatory item much like what is done for QA.

SYSTEMS DEVELOPMENT LIFE CYCLE

* Public Water Service Supply (PWSS) effort started with an ISP which identified systems to develop first. The effort included Regions and States for requirements. The use of CASE helped to get immediate feedback and "buy in" with "on the spot" documentation. Emphasis was on requirements with validation. Also looked at public and local govt. needs. Able to develop system more quickly (esp. through - Rapid Application Design (RAD) of subsystem identified in ISP). Has gone to pilots in States and getting good feedback.
* Need more emphasis on flexibility within policy, procedures, and standards.
* Need to identify what level of mandatory policy can be enforced no matter what, ensure policies can be implemented (some policies cannot be implemented, some are not applicable).

* Need understanding of policies, standards, and procedures plus budget to implement.
* May be useful to have an O&M SDC as well as a development SDC. Would be difficult to support an SDC at each Region.
* Need some mechanism to determine if a system should be scrapped.

COMMUNICATION

* Need exposure to policies, procedures and standards through training.
* Keep up pressure (audits). Enforcement of policies is crucial.

Note: This interview session included key EPA SDC management personnel as well as key contractor SDC management personnel.

SUMMARY OF HEADQUARTERS INTERVIEW
SUBJECT: SUPERFUND

Problems Identified

- Have had some problems with definitional interpretation.
- The CERCLIS information system interface with the Agency's financial system has not been reestablished following replacement of the system with IFMS.
- The Office of Information Resources Management does not have control over the Agency's IRM program.
- The Agency has not adequately defined commonality between information systems.

Root Causes

- The Office of Information Resources Management does not enforce IRM policies, procedures, and standards.
- Agency management does not understand the cost of information.
- The Office of Information Resources Management does not have a clear mission statement.

Recommendations

- Recruit and place technical professionals in the program offices. These professionals need to be EPA FTEs.
- Make available a core staff of IRM professionals (Agency FTEs with technical expertise).
- Provide technical training (e.g., systems management training).
- Make end-users responsible for data quality.
- Take steps to monitor data quality.
- The Office of Information Resources Management needs to enforce IRM policies, procedures, and standards if they develop them.
- System changes need to have buy-in from Headquarters and the Regions. Need to build consensus.
- Resist asking Regions to collect information that they do not use or need.
- Need to get data off of the mainframes and in the hands of users and managers.
- Need to conduct IRM planning up front.
- Need to link the IRM plan to the budget.
- Control of IRM needs to take place at the program level.
- IRM support services should be provided as part of a program-level mission support contract.

Additional Comments

- Superfund information systems provide the information necessary to manage the program.
- Many of the core CERCLIS utilities were originally developed in the Regions.
- Senior management support is critical.
- Support from the OSWER Information Management Staff has been valuable.
- Don't see a need to merge information systems that contain unique information.

SUMMARY OF HEADQUARTERS INTERVIEW
SUBJECT: PERFORMANCE MEASUREMENT

The Review Team met with representatives from the OPPE Strategic Planning and Management Division and OARM Financial Management Division. The purpose of the meeting was to discuss the Agency's accomplishments reporting capabilities and its efforts to implement the "Government Performance and Results Act of 1993."

STARS

Strategic Planning and Management Division is responsible for running STARS. STARS is the Agency's official accomplishments reporting system. An OPPE official explained that 97% of the data in STARS system comes from other Agency databases (CERCLIS, RCRIS, etc.) and that the data relates primarily to "activities that the Agency performs." The system contains a significant amount of enforcement and Superfund data.

Past administrations have used information reported by the system (in quarterly reports) to question AA's and RA's about accomplishments. However, the immediate previous and current EPA Deputy Administrators have not used STARS information heavily. Mr. Habicht was briefed on the STARS information before visiting a Regional office, but did not "question" Regional management about information reported in STARS. OPPE officials believe that the current low usage relates to the fact that program management has not yet been fully established or that it does not fit the management style of the new administration.

STARS II

The STARS II system, which is currently in the conceptual stage, will get closer to identifying outcome related information (versus purely "bean counting" accomplishment data). OPPE believes this would be an improvement on the current system. However, whether or not the system will receive outcome information from Agency systems (as STARS now receives "bean counting" accomplishment information) is not known at this time. System planners do not envision the system including many environmental indicators. Primary reasons for developing STARS II are to link resources to accomplishments and to have representation from all program offices. Targets/commitments are set on an annual basis. Target setting for FY 1994 is going on now. Targets are locked at the end of April.

STARS II documentation to date consisted of briefings given (in the August timeframe). This is the latest information available (and it may be slightly out of date - particularly from the standpoint of incorporating the NPR results).

PERFORMANCE MEASUREMENT

A case study is currently being performed using the Chesapeake Bay program. The purpose of the case study is to identify obstacles, stumbling blocks, etc. An additional purpose is to tie together resources, output, and outcomes. The problem with this case study is that State resources are not being accumulated as part of the project (which means that the measurement of accomplishments per resource will be overstated).

The Agency anticipates participating at some level of response to the Government Performance and Results Act of 1993 (GPRA). At this time, however, EPA is not participating in any pilot project. A GPRA workgroup is drafting a letter to OMB expressing interest in a GPRA pilot project. The pilot area should be identified in the near future.

The STARS II effort would be a performance measurement project and is expected to tie into the budget system (link to IFMS and/or RMIS) and would report GPRA results (including accomplishments compared to goals). STARS II is expected to tie planning, budgeting, and accomplishments together. Information needs to be tied into measurement as well, but at this point the Agency is still grappling with conceptual issues. No software tools were being used to identify available sources of the data needed for STARS II at the time of this meeting. The review team pointed out that it is during this conceptual stage that software tools are needed for identification of information sources.

While more than 90 percent of STARS data is submitted from program information systems, OPPE does not perform data quality work. However, there is a discrepancy resolution process whereby the Regional "numbers" and Headquarters "numbers" are printed and compared. Differences are formally hashed out at the Assistant Administrator and Regional Administrator level. If no agreement can be reached, the Headquarters number is used. Discrepancies are usually the result of timing differences and are negotiated between the Regional Administrators and Assistant Administrators.

SIRMO INTERVIEW SUMMARY No. 1

This SIRMO emphasized that much information is available, but that a typical manager must usually rely on an intermediary person to get the information. The ideal is for managers to have readily accessible and more user-friendly systems that they can use directly. The SIRMO acknowledged Headquarters resource constraints preclude making systems more user-friendly and believes national systems provide useful information but more is needed. National systems that are designed to answer Congressional questions rarely meet Regional needs. There usually is little or no Regional ownership of the data being fed into the national systems.

This Region has or is in process of automating many administrative systems: training, contracts management, travel, and procurement. The SIRMO discussed advances in the Agency: the goals project and TRIS as success stories, and stated that she believes the Agency is "on the cusp" of beginning to really use its information well. Possible obstacles contributing to any inability to provide basic management information through the Agency's information systems were discussed.

OBSTACLES

Lack of a distinct program element for IRM in the Regions leads to inadequate funding for IRM related FTE resources stemming from the current practice of lumping this requirement with all other resource management issues. Outmoded software and the need for cultural change in which managers would be seen as end users, able to retrieve information without an intermediary were described as obstacles. The Headquarters EPAYS system's inability to interface with this Region's on-line training system, requiring Regional staff to re-key training data in batch to EPAYS, is a lost efficiency.

RECOMMENDATIONS

Establish an Headquarters IRM official organizationally placed above all Assistant Administrators.

Establish an Agency standard relational database management system for all applications.

Continue culture change that fosters significant user involvement in system development projects.

Ensure all system development projects have clear understanding of customers' and users' needs. For example, repeat the recent effort where Regional programmers went to Headquarters to work on ICMS.

Revise FIP resource acquisition requirements which apply equally to purchases of diskettes and toner cartridges as well as major purchases of much greater value.

SIRMO INTERVIEW SUMMARY No. 2

This SIRMO indicated that generally data (environmental, permit, water quality, etc.) is not easy to get at and does not serve purposes of what users (public/local government) want or need it for. By way of example he said that often they dial an "800" number, get a wrong number, nobody answers it, and when they do get through it's not what they thought or wanted. The SEDM program was a good program and was allocating funds to enhance State capacity but this was dropped in FY 92 or 93. A Task Force, started under Administrator Reilly, found that States do not have tools to do the job. A Steering Committee is implementing the Task Force report, with support from the National Performance Review and Cabinet status bill for EPA. Initiatives are integrally involved in data management.

Management often relies on staff and often assumes that things are taken care of, especially when they have good staff. If you have good staff (under the SIRMO functions) you tend to devote less time to the SIRMO function. He estimated that he spends about 25% or less on SIRMO duties because he has a very good staff. He felt his recent detail to Headquarters was very useful because it helped to improve communication and relationships with key Headquarters management.

The SIRMO expressed concern over whether we really protect data and have the right people handling data. He felt that additional work was needed in this area.

Regarding resources, he will get the client (program manager) to provide people before committing his resources. After work is initiated, the client is trained to provide continuity and reduce need for his resources on a continuing basis. He felt that planning is pretty good in the Region. He sends out call memos at the beginning of each FY and mid-way through to determine what IRM support is needed. There could be benefit from long-term planning, however.

OBSTACLES

* The public and local governments are frequently not identified as users up front in the process.

* Lack of the ability for management to quickly communicate issues.

* Not enough attendance by SIRMOs at ARA meetings.

* People (program managers) not always willing to commit resources for developing systems/applications.

* There is a tendency to add on to systems and not enhance what is there. Quality data is best when everybody has to access to do their job.

RECOMMENDATIONS

* State Data Capacity - one current effort trying to get better communication, with minimum investment, via e-mail between States/Regions/Headquarters to more quickly identify and respond to issues.

* Management needs to be more proactive in getting information from staff and ensuring that things are done.

* If you have senior staff substitute in some of the IRM meetings, it is critical that you have good communication both before and after the meeting.

* Need assessments to determine how best to handle data/who should handle data.

* Need to commit/invest time and dollars to get good data.

APPENDIX VI

AGENCY PARTICIPANTS IN FOCUS GROUPS AND INTERVIEWS

HEADQUARTERS

Office of Administration and Resources Management
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Jeff Byron, Chief, Information Systems Management Branch, Program Systems Division
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Tom McMenamin, Superfund Program Management Team

Water Management Division

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OIG REPORTS, GAO REPORTS, EPA MANAGEMENT REPORTS, AND CONGRESSIONAL TESTIMONY

Note: The codes following each document date (e.g., OIG-A-V1) have been assigned uniquely to each report and testimony, and provide a cross-reference to individual recommendations in Appendix IX, column entitled "Reference/Page."

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1. Report on Special Review - ADCR IBM Mainframe Password Exposure, Report No. E1NMG0-15-0023-0400003, dated December 21, 1989. (OIG-A-V1)

2. Report on CERCLIS Reporting, Report No. E1SFF9-15-0023-0100187, dated March 12, 1990. (OIG-B-V1)

3. Review of the Fiscal Year 1988 Superfund Report to Congress, Report No. E1SFF9-11-0015-0100227, dated March 28, 1990. (OIG-C-V1)

4. Flash Audit Report - Disclosure of User Passwords on EPA's IBM 3090 Computer Mainframes, dated May 7, 1990. (OIG-D-V1)

5. Report on Special Review - CERCLIS Post-Implementation Evaluation, Report No. E1SFG0-15-0020-0400019, dated June 14, 1990. (OIG-E-V1)

6. Report on Special Review - Hotline Complaint Concerning the Office of Research and Development's Modeling and Monitoring Tracking System, Report No. E1NBG0-15-0038-0400037, dated September 24, 1990. (OIG-F-V1)

7. Flash Audit Report - Vulnerability of Sensitive Payroll and Personnel Files on the National Computer Center (NCC) IBM 3090 Computer System, dated September 26, 1990. (OIG-G-V1)

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9. Integrated Financial Management System: Managing Implementation of the New Accounting System, Report No. E1AMF0-11-0029-1100153, dated March 29, 1991. (OIG-I-V1)

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11. Improvements Needed in EPA's Resource Access Control Facility (RACF) Security Software, Report No. E1NMB0-15-0027-1100151, dated March 29, 1991. (OIG-K-V1)

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19. Annual Superfund Report to the Congress for Fiscal 1991, Report No. P1SFF1-11-0026-2100660, dated September 30, 1992. (OIG-S-V2)

20. Special Review of EDP Internal Controls for Selected Pesticide Revolving Funds' Information Systems, Report No. E1EPP2-15-7001-3400043, dated March 31, 1993. (OIG-T-V2)

21. Special Review of Allegations Regarding Copyright Infringement Within the Office of Communications, Education, and Public Affairs, Report No. E6AMG3-15-0071-3400042, dated March 31, 1993. (OIG-U-V2)

22. Consolidated Report Regarding Fiscal 1992 CERCLIS Data, Report No. E1SFF3-11-0016-3100392, dated September 29, 1993). (OIG-V-V2)

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25. FINANCIAL AUDIT: EPA's Financial Statements for Fiscal Years 1988 and 1987, Report No. GAO/AFMD-90-20, dated March 16, 1990. (GAO-B-LIB)

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30. PESTICIDES: EPA Could Do More to Minimize Groundwater Contamination, Report No. GAO/RCED-91-75, dated April 29, 1991. (GAO-D-LIB)

31. HAZARDOUS WASTE: Data Management Problems Delay EPA's Assessment of Minimization Efforts, Report No. GAO/RCED-91-131, dated June 13, 1991. (GAO-E-LIB)

32. ENVIRONMENTAL ENFORCEMENT: Penalties May Not Recover Economic Benefits Gained by Violators, Report No. GAO/RCED-91-166, dated June 17, 1991. (GAO-F-LIB)

33. TOXIC CHEMICALS: EPA's Toxic Release Inventory Is Useful but Can Be Improved, Report No. GAO/RCED-91-121, dated June 27, 1991. (GAO-M-V2)

34. WASTE MINIMIZATION: EPA Data Are Severely Flawed, Report No. GAO/PEMD-91-21, dated August 5, 1991. (GAO-G-LIB)

35. PESTICIDES: Better Data Can Improve the Usefulness of EPA's Benefit Assessments, Report No. GAO/RCED-92-32, dated December 31, 1991. (GAO-N-V2)

36. FOOD SAFETY: USDA Data Program Not Supporting Critical Pesticide Decisions, Report No. GAO/IMTEC-92-11, dated January 31, 1992. (GAO-H-LIB)

37. INFORMATION RESOURCES: Summary of Federal Agencies' Information Resources Management Problems, Report No. GAO/IMTEC-92-13FS, dated February 13, 1992. (GAO-D-V1)

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39. WASTE MINIMIZATION: Major Problems of Data Reliability and Validity Identified, Report No. GAO/PEMD-92-16, dated March 23, 1992. (GAO-J-LIB)

40. ENVIRONMENTAL ENFORCEMENT: EPA Needs a Better Strategy to Manage Its Cross-Media Information, Report No. GAO/IMTEC-92-14, dated April 2, 1992. (GAO-E-V1)

41. ENVIRONMENTAL ENFORCEMENT: Alternative Enforcement Organizations for EPA, Report No. GAO/RCED-92-107, dated April 14, 1992. (GAO-O-V2)

42. SUPERFUND: Problems With the Completeness and Consistency of Site Cleanup Plans, Report No. GAO/RCED-92-138, dated May 18, 1992. (GAO-P-V2)

43. WATER POLLUTION MONITORING: EPA's Permit Compliance System Could Be Used More Effectively, Report No. GAO/IMTEC-92-58BR, dated June 22, 1992. (GAO-F-V1)

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51. SUPERFUND: EPA Actions Could Have Minimized Program Management Costs, Report No. GAO/RCED-93-136, dated June 1993. (GAO-S-V2)

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52. National Archives and Records Administration - Records Management in the Environmental Protection Agency, dated February 19, 1992. (EPA-A)

53. EPA IRM Compliance Strategy Task Group Report, dated October 1, 1992. (EPA-B)

54. Analysis of Materiality of Weaknesses in the United States Environmental Protection Agency's Information Resources Management Program, dated December 14, 1992 (prepared by Federal Sources, Inc.). (EPA-C)

55. Written comments by Paul Wohlleben, Acting Director, Office of Information Resources Management, on strengthening EPA's IRM program, dated May 19, 1993. (EPA-D)

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60. Nomination of Carol M. Browner, Hearing before the Committee on Environment and Public Works, U.S. Senate, on June 11, 1993. (T-EPA-D)

61. Why EPA Should be a Cabinet Department, Statement by Administrator Carol Browner to the Committee on Governmental Affairs, U.S. Senate, on February 18, 1993. (T-EPA-E)

62. Creation of a Department of the Environment, GAO testimony before the Committee on Governmental Affairs, U.S. Senate, Document No. GAO/T-RCED-93-6, dated February 18, 1993. (T-GAO-F)

63. Testimony of Administrator Carol M. Browner before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, U.S. House of Representatives, on March 10, 1993. (T-EPA-G)

64. Testimony of EPA Inspector General John C. Martin before the Subcommittee on Legislation and National Security, and the Subcommittee on Environment, Energy and Natural Resources of the Committee on Government Operations, U.S. House of Representatives, on March 29, 1993. (T-OIG-H)

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67. SUPERFUND: Progress, Problems, and Reauthorization Issues, GAO testimony before the Subcommittee on Transportation and Hazardous Materials, Committee on Energy and Commerce, U.S. House of Representatives, Document No. GAO/T-RCED-93-27, dated April 21, 1993. (T-GAO-K)

68. Testimony of EPA Inspector General John C. Martin before the Subcommittee on Legislation and National Security, and the Subcommittee on Environment, Energy and Natural Resources of the Committee on Government Operations, U.S. House of Representatives, on May 6, 1993. (T-OIG-L)

69. Creation of a Department of Environmental Protection, GAO testimony before the Subcommittee on Legislation and National Security and the Subcommittee on Environment, Energy, and Natural Resources, Committee on Government Operations, U.S. House of Representatives, Document No. GAO/T-RCED-93-39, dated May 6, 1993. (T-GAO-M)

70. Testimony of Administrator Carol M. Browner before the Subcommittee on Superfund, Recycling and Solid Waste Management of the Committee on Environment and Public Works, U.S. Senate, on May 12, 1993. (T-EPA-N)

71. Testimony of EPA Inspector General John C. Martin before the Subcommittee on Superfund, Recycling and Solid Waste Management of the Committee on Environment and Public Works, U.S. Senate, on June 10, 1993. (T-OIG-O)

72. SUPERFUND: EPA Action Could Have Minimized Program Management Costs, GAO testimony before the Subcommittee on Superfund, Recycling, and Solid Waste Management, Committee on Environment and Public Works, U.S. Senate, Document No. GAO/T-RCED-93-50, dated June 10, 1993. (T-GAO-P)

73. Testimony of EPA Inspector General John C. Martin before the Committee on Governmental Affairs, U.S. Senate, on June 22, 1993. (T-OIG-Q)

74. SUPERFUND: Little Use Made of Techniques to Reduce Legal Expenses, GAO testimony before the Subcommittee on Transportation and Hazardous Material, Committee on Energy and Commerce, U.S. House of Representatives, Document No. GAO/T-RCED-93-60, dated June 30, 1993. (T-GAO-R)

75. ENVIRONMENTAL PROTECTION: EPA Faces Formidable Challenges Managing Water Quality Data, GAO testimony before the Subcommittee on Clean Water, Fisheries and Wildlife, Committee on Environment and Public Works, U.S. Senate, Document No. GAO/T-AIMD-93-2, dated August 5, 1993. (T-GAO-S)

APPROACH AND METHODOLOGY

I. Project Plan

The initial draft of the project plan was developed by the OIG team members in September 1993. OIRM and OSWER team members were selected and joined the team in October 1993. When the entire team was assembled, the project plan was reviewed, changed and agreed to by all team members.

The project plan identified the review objectives, background, scope and methodology, location of the project work, preliminary project work, and milestones and associated time frames. The following description of the approach and methodology documents in more detail the methodology used.

II. Initial Field Work

This phase was completed by OIG staff prior to assembling the entire team.

A. Collection of Previous Reports

Copies of prior OIG and GAO reports addressing the IRM and Superfund programs, and OIG and GAO position papers and interview summaries for ongoing reviews were obtained and reviewed. Copies of any relevant documents, reports, or studies (e.g., task force reports, contractor studies, Superfund reauthorization studies, testimonies, etc.) directed at resolving problems with the Agency's IRM program, especially within Superfund, were also obtained and reviewed. Throughout the rest of the review, as additional documentation was identified it was reviewed and the references were added to the master list. A complete list of documents used in performing this review is contained in Appendix VII.

The scope of the review was limited to audit reports and studies completed since fiscal 1990 so that the most current issues would be addressed.

B. Consolidation and Analysis of Previous Report Recommendations

OIG staff analyzed the assembled documents and listed all the recommendations to identify root causes, problems, issues and concerns, which were then prioritized and

categorized into subject areas. This effort resulted in an initial listing of 7 categories. Five statements of problem issues and concerns were developed, and 23 root causes were identified and distributed among the 7 categories. From this analysis a two-page summary entitled "Previously Identified Root Causes for IRM Problems" was developed.

A spreadsheet of all previous recommendations was developed based on the assembled documentation. These previous recommendations were then grouped by the identified root causes. The spreadsheet further identified the office responsible for implementing each recommendation, the Agency response, any OIG comments, a document reference and page, additional or associated causes, and a priority (high, medium, or low). The recommendations were initially prioritized by consideration of the relationship to the root cause(s), issue/concern, and mission; breadth of impact (Agencywide vs. system-specific); relationship to Superfund; whether it was a recurring issue (severity of the problem area); currentness of the report; complexity of the recommendation; potential cost; and timing of scheduled implementation.

III. Previous Recommendations' Priority Determination and Refinement of Initial Field Work Results

Once the joint OIG/Agency review team was assembled, it reviewed, revised and approved the documents prepared to that point. Where possible, additional documents were identified and obtained. For example, Superfund officials initiated a significant data collection effort during the summer and related activities were continuing in the Superfund program in preparation for Congressional reauthorization. The review team collected and analyzed relevant data for inclusion in the review process.

A second review of the listing of problem issues/concerns and root causes resulted in increasing the problem issues/ concerns statements to six and redistributing root causes among five rather than seven categories. The two page summary, "Previously Identified Root Causes for IRM Problems," was revised.

Finally, the priorities assigned in the spreadsheet of recommendations were reviewed. A refined ranking was based on: the relationship to root cause(s), issues/concerns, and mission; the breadth of the recommendation's impact (addressing a broad IRM problem area); the relationship to Superfund; whether the

issue is a single or recurring issue; and the currency of the report.

IV. Development of Legislative Issues

After initial analysis and focus group sessions, high level IRM-related legislative issues were developed by the team. These issues were relevant to Superfund reauthorization and/or legislation to elevate the Agency to Departmental status. Throughout the project, periodic briefings were given to key Congressional staff, which included these issues.

V. Identification of and Notification to Participants

Headquarters and Regional IRM and program senior staff were invited to participate in Total Quality Management (TQM)-style focus groups and interviews to validate the problems, root causes, and solutions identified by the review team analysis.

Our goal was to obtain input from a cross-section of the Agency and focus as much as possible on Superfund, as specifically identified in the Congressional request. Superfund emphasis provided the framework for selection of Regional offices and led to inclusion of a separate Headquarters interview with Superfund system managers.

Selection of Regions was based on Superfund budget information, the nature and variability of Superfund work in the Regions, review team size, time and travel constraints, and participant impact considerations. Three Regional offices were selected for focus group sessions: Region 2 (New York, NY), Region 4 (Atlanta, GA), and Region 9 (San Francisco, CA).

Headquarters organizational representation focused on obtaining a cross-section of the Agency programs: (1) SIRMOs from all program offices, including selected systems managers recommended by the SIRMOs, were identified to take part in a focus group session to provide feedback from a programmatic perspective; (2) inclusion of OPPE was designed to address performance measurement and Agency strategic planning; (3) a "Data Integration" session was designed to obtain feedback on specific data integration issues; (4) the Systems Development Center (SDC) session was selected for feedback on system development life cycle issues related to major information systems, with a focus on the Superfund program area; and (5) a separate teleconference with Air program officials was held because the AIRS major system program component is located in Research Triangle Park, NC.

A. Identification of Participants

Identification of individual participants was based on the criteria of obtaining a management cross-section of programs, focusing on major IRM initiatives and automated systems, and talking to as many SIRMOs as possible. The overriding constraints were keeping focus group sessions to a workable size of 12 to 15 people, and keeping interviews to 6 people or less (optimally 2-3). These group sizes were suggested optimums based on individual team member experience and discussions with experienced focus group facilitators.

All SIRMOs in the selected Regions were interviewed separately to reduce impacts on their time. To obtain management perspective and programmatic overview, the focus groups were comprised of Regional Division Directors/Deputy Directors and Branch Chiefs. In addition, the IRM Branch Chiefs and other knowledgeable staff from each Region were invited when possible. Participation was weighted toward the Superfund program.

All Headquarters SIRMOs were invited to participate in a focus group, along with a major information system manager from their office. However, the SIRMOs from the Office of Enforcement participated in a separate interview session, and the SIRMO from the Office of Air and Radiation attended a teleconference.

OPPE participation included individuals involved in performance measurement and the STARS system. The "Data Integration" session participants were based on leadership in the two largest data integration initiatives, Envirofacts/Gateway (OIRM) and IDEA (OE). The Superfund session participants were selected from CERCLIS system/ program managers. Finally, the SDC interview participants were selected from both EPA and the contractor.

B. Notification and Refinement of Participants

In advance of the meetings, each participant was notified in writing and received a standard information package, including the summary of previously identified root causes for IRM problems, to help them prepare to participate. Each Assistant Regional Administrator (ARA) (who function as the Regional SIRMOs), Headquarters SIRMO, and "special group" participant was contacted by the project manager or a team member to confirm participation. We

encouraged the ARAs to review the participant list to ensure the participants were the best representatives of the Region's IRM and Superfund efforts and to replace invitees where appropriate.

VI. Conduct of Interviews and Focus Groups and Verification of Feedback

A. Planning and Preparation

Team member participation in focus sessions, interviews, and teleconferences was based on team size and individual team member schedules. Each team member was assigned to a "sub-team" consisting of one OIG staff and one Agency staff member. Each sub-team was responsible for setting up and attending one Regional focus group. Attendance at the Headquarters focus group and interviews was determined primarily by availability during the scheduled time (some sessions were held concurrently) and expertise in the subject matter. At least two team members attended each session.

Team members attended each focus group session to provide introduction and background, answer questions, and clarify and record results. During the interviews and teleconferences, team members also asked questions to ensure all areas of concern were addressed.

The focus group sessions were split into two half-day sessions, based on discussions with experienced facilitators who indicated that was the minimum time necessary to arrive at meaningful results while minimizing impacts on management resources.

The list of "Previously Identified Root Causes for IRM Problems" provided guidance to the focus group facilitators as a basis for obtaining feedback. The sessions were to verify the problem areas and root causes, and allowed the participants to reject them and articulate their own perceived problems and associated root causes. Finally, the participants were asked to identify solutions for the root causes. This approach was discussed with each facilitator and was used throughout the focus group sessions.

B. Conduct of Focus Groups, Interviews and Teleconferences

Review team members and facilitators discussed and planned all sessions in advance. All sessions used the

notification package summarizing previously identified root causes for IRM problems as the basis for obtaining feedback.

The focus group sessions at the Regional offices and Headquarters were moderately structured. Although the sessions were conducted under the same framework, some flexibility was allowed based on determinations of whether the sessions were progressing enough to elicit sufficient feedback. One focus group had the benefit of two facilitators, which allowed use of smaller groups to address more root causes and solutions. In that focus group, the results of the small groups were always discussed and verified in the larger group. The other focus groups had one facilitator and the process was conducted in one large group.

The first focus group session was evaluated both during and subsequent to its conclusion to provide feedback on positive and negative aspects of the process for subsequent facilitated sessions. All focus group sessions were evaluated throughout, to continually improve the process and ensure that sufficient feedback was obtained. Although minor details of methods may have varied between facilitated sessions (based on facilitators' individual experiences and training), all sessions were conducted in a generally consistent framework as follows.

After discussing the previously identified root causes, each of the problems was either verified as relevant to the participants or rejected. The participants were then invited to identify additional problems. These problems were prioritized by multi-level voting. There was usually a distinct break point in voting scores that determined the highest priority problems.

Addressing the problems in priority order, the participants identified root causes for each. Once all the root causes were identified, they were likewise prioritized by multi-level voting. The highest priority root causes were further discussed to determine solutions. The choice of where to break the list of high priority root causes was discussed between the review team members and the facilitator(s) to determine what was achievable in the remaining time. At the end of the session the results were summarized.

Interviews and teleconferences were shorter and consisted of a more free-form flow and expression of

problems, root causes and solutions. Team members functioned to clarify statements, ask questions to maintain the pace of the interview, and address specific areas of concern. Although useful feedback was obtained, this method made analysis of results more difficult, and relative priorities of problems, root causes and associated solutions could not be determined.

C. Verification of Feedback

All session results were typed and returned to the individual participants for verification. Participants were given at least one week to respond with additions or corrections. They were not required to respond if no additions or errors were noted.

VII. Summary and Synthesis of Results

The review team evaluated the results of the focus groups. Comprehensive assessments of the previously identified root cause subject area headings were completed, and all results were organized into additional or revised subject areas as identified in the focus groups. Also, the analyses determined whether these subject areas were valid and logical for categorizing problems and solutions. Additional subject areas were identified, such as the area of data management.

The logical progression of the analysis led to consolidating the problems, root causes, and solutions statements from all sessions. Once consolidated statements were developed, the problem statements were matched to root causes.

The consolidated lists of solution statements were ranked and placed into clusters of related solutions. The review team ensured consistency and integrity in the report by tracing back all the solution statements to their respective root causes, and the root causes to their respective problem areas. In this manner, the team ensured that all root causes were addressed by the solutions, and that the solutions were fully responsive to the root causes. As a final analysis, the review team identified the solutions that cut across multiple problem areas, and used this analysis to assist in refining the presentation of the recommendations in the report.

VIII. Follow-up on Previous Recommendations

Using the priority list of previous recommendations, members of the Agency's IRM community were asked to provide status

updates for the high priority recommendations. These members of the IRM community were identified based on the responsible offices for each recommendation, identification in automated reporting and tracking systems, and the review team's subjective judgment of which individuals within the offices would have direct awareness of the current implementation status.

Existing audit reporting and tracking systems were used where possible to generate the most current reports, and the scope of the request for status information was kept tightly focused. When automated tracking reports were not sufficient or had not been recently updated, the respondents were contacted and asked to provide:

- STATUS (is the recommendation completed, in progress, or not started?),
- DATE (date completed or target date for completion), and
- COMMENTS (a few sentences describing the effort and/or upcoming milestones).

Because of the breadth of prior recommendations, the request for status information went to many organizations. These included OPPTS, OSWER, OE, Office of Acquisition Management, Office of the Comptroller, NDPD, and all divisions and staffs of OIRM. In most cases, electronic mail was used to convey the initial request, with follow-up for clarification by phone, fax, or face-to-face discussion.

The review team formatted all responses similarly, and arranged them into the matrix contained in Appendix IX. Where timing and review team resources allowed, there was additional follow-up to obtain missing dates and to resolve any confusion about particular comments. Finally, responses were sent back to the respondents for verification.

IMPLEMENTATION STATUS OF PRIOR HIGH-PRIORITY RECOMMENDATIONS

BACKGROUND: This appendix contains information gathered from selected members of the Agency's IRM community, chosen because of their personal, hands-on knowledge of EPA's responses to prior audit recommendations. The responses are based on the official status of corrective actions, as tracked in various management audit tracking systems, and include additional details obtained directly from those who implemented the recommendations. The responses tend to be more detailed and specific than those available through the formal audit implementation tracking channels.

The recommendations highlighted in this appendix come from a variety of OIG, GAO, and Agency reports issued since 1990. These high-priority recommendations are a small subset of all the recommendations contained in the documents listed in Appendix VII. These particular recommendations were prioritized for followup because the review team judged them to be especially important. Further details about how the review team established the relative priorities of prior recommendations are provided in Appendix VIII.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Notify the user community of the new NDPD IBM Mainframe Security Policy which specifically addresses generic User-Ids (SYSTEM), shared User-Id, User Support authentication issues, and several production control security issues.	AA-OARM	OIG-A-V1/3	Completed	Various	NDPD has published user memos, brochures, and other documents describing the NDPD security policy, RACF, etc.
Source programs and load modules will reside in a centralized library.	AA-OSWER	OIG-B-V1/14	Completed	Dec-89	OSWER has established the reports librarian function and revised the reports development procedures. All five of the following audit recommendations have been incorporated into the reports development procedures.
Signoff from the EPA program office (report owner) will be required for all report specifications, reports library documentation, and test/sample reports.	AA-OSWER	OIG-B-V1/9	Completed	Dec-89	
Signoff from the EPA program office (report owner) will be required for all report modifications prior to reinstatement to the production reports menu.	AA-OSWER	OIG-B-V1/14	Completed	Dec-89	as above
Any changes to source code will be recorded within the program in the form of comments. Additionally, a report change log must be updated each time a report is modified.	AA-OSWER	OIG-B-V1/14	Completed	Dec-89	as above
When a change is made to one program report developers will consult the reports librarian to see if related or affected programs need to be changed.	AA-OSWER	OIG-B-V1/14	Completed	Dec-89	as above
OERR/MSDS will review reports usage analysis and solicit user comments to identify all reports critical to end of the year reporting and FY90 planning. These reports will be given highest priority for review and correction. As problems are identified, users will be informed.	AA-OSWER	OIG-B-V1/17	Completed	Dec-89	This was completed by establishing the reports librarian.
All reports not identified as critical to end of the year reporting or FY90 planning will be removed from the CERCLIS National Reports Menu and made available only through a special menu on the production system until such time as each report can be verified, tested and released onto the National Reports Menu. As part of this complete audit of CERCLIS reports, reports will also be identified for deletion or combination.	AA-OSWER	OIG-B-V1/17	Completed	Dec-89	This was completed by establishing the reports librarian.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Activate the RACF option PROTECTALL.	D-NDPD	OIG-D-V1/2	Completed	Dec-93	The RACF PROTECTALL option was implemented in December 1993.
Require that a complete assessment of CERCLIS software be performed as soon as feasible.	AA-OSWER	OIG-E-V1/8	Completed	Jun-90	There was a joint OIG/OSWER/OERR decision not to perform an assessment of CERCLIS while System 2000 was the DBMS since the Agency has made a decision
Require that evaluations be made of the four areas discussed herein: data management, change controls, data base integrity, and security.	AA-OSWER	OIG-E-V1/6	Completed	Jun-90	to move all S2K users to new platforms and assessment of CERCLIS in the current environment was a moot point.
Require the Director of the OSWER Information Management Staff to include the requirement for independent testing and verification procedures in the performance of system evaluations.	AA-OSWER	OIG-E-V1/6	Completed	Dec-89	OSWER/IM has established an ongoing delivery order for IV&V using the MOSES contract, which provides for independent validation and verification of all systems upon request.
Require that RACF training be developed and made mandatory for system and account managers.	D-OIRM	OIG-G-V1/3	Completed	Dec-93	NDPD account managers were trained by 12/92, then NDPD trained other account managers by 12/93. In addition, all RACF security administrators received mandatory training.
Immediately initiate a review of PAYS and TAPP to determine the appropriate access levels for individual users and eliminate access to those users that do not have an absolute need.	D-OIRM	OIG-G-V1/3	Completed	Nov-93	Review of profiles and access levels is complete, with ongoing reassessment to eliminate access for users who do not have an absolute need.
Promulgate formal EPA guidance regarding the system decision process during the development and implementation of large information systems.	AA-OARM	OIG-I-V1/18	In progress	Jan-94	revised SLCM policy drafted 6/93, review of draft in progress, green border review forthcoming, procedures & stds to be developed, related changes have also been made to draft revised charter for IRM Steering Committee
Involve all user groups in developing and implementing the Agency's financial management system, and document that their needs and priorities were considered in deciding the direction and plans for the system.	AA-OARM	OIG-I-V1/32	Completed	Sep-90	Two formal groups exist to manage IFMS. There is an executive management group and a systems management group. Both ensure that user needs are documented and addressed in deciding the directions for the system.
Establish procedures to coordinate the update of the Mainframe capacity report, master facility plan, and budget tracking system report to continually reflect current workload trends and revised requirements in all three documents.	D-OARM/RTP	OIG-J-V1/10	Completed	Sep-92	NDPD updates the reports on a quarterly basis at a minimum. The Mainframe Capacity Report information is used for the Master Facility Plan and the Budget tracking system.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Establish annual reviews of user-developed applications to determine which applications should be updated and, based on the results of those reviews, take appropriate action.	D-OIRM	OIG-J-V1/13	Closed	Feb-92	This recommendation falls outside the scope of NDPD's mission. The audit was closed by OIG on 2/2/92. Periodic reviews of the Agency's applications are required, per Agency Directive 2100.
Perform a formal cost-benefit analysis to determine which major applications should be rewritten to increase their performance and reduce overall costs and, based on the review results, take appropriate action.	D-OIRM	OIG-J-V1/13	Closed	Feb-92	This recommendation falls outside the scope of NDPD's mission. The audit was closed by OIG on 2/2/92.
Establish production control configuration management and quality assurance procedures for the user community, which includes the incorporation of a limited access central data set for all jobs placed in production.	D-OARM/RTP	OIG-J-V1/28	Completed	Jan-91	Implementation of the job scheduling package JOBTRACK satisfied this recommendation.
Charter the task force to conduct an analysis of datafile and table creation, storage, and retention to determine if efficiencies can be gained by eliminating processing steps.	D-OARM/RTP	OIG-J-V1/26	Closed	Jan-91	The objectives of this recommendation will be achieved through implementation of the job scheduling package. During this process, the JCL will be reviewed and any processing inefficiencies can be addressed.
Provide guidance and training to account managers regarding their roles and responsibilities for controlling the issuance of access authorities.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	Nov-93	All RSAs have been trained regarding these issues, RACF Security Administrator's Guide was completed 11/92. All NDPD and other account managers have been trained.
Determine the IBM mainframe accounts that process highly sensitive data and develop requirements for protecting resources under those accounts.	COMPTROLL D-OIRM D-OARM/RTP	OIG-K-V1/19	Completed	Apr-93	NDPD has trained account managers how to protect highly sensitive accounts with RACF. However, NDPD does not have the resources to analyze each application running on the NCC mainframes. Directive 2195 establishes the requirements for protecting automated information resources.
Give account managers the primary responsibility to control issuance of access authorities (CREATE, GRPACC, etc.) for users assigned to their accounts.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	Dec-93	Through the decentralization project, NDPD is training account managers to assume the recommended responsibilities.
Reduce and maintain the number of users with SPECIAL, OPERATIONS, AUDITOR, and ALTER access authorities to an absolute minimum.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	May-93	The number of users with high level system RACF authorities has been reduced to the minimum level required to maintain security and service level goals.
Activate the audit trail features of the RACF control mechanism for highly sensitive accounts.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	Dec-93	All RACF audit trail features have been activated for sensitive accounts.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Turn on the RACF OPERAUDIT feature to monitor activities of users assigned the SYSTEM OPERATIONS authority.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	Jun-92	OPERAUDIT is on and is being monitored on a weekly basis.
Revoke the ALTER authority of those users assigned highly sensitive accounts who do not warrant this authority and maintain a minimum number of users with this authority.	D-OIRM D-OARM/RTP	OIG-K-V1/12	Completed	May-93	The number of users with high level system RACF authorities has been reduced to the minimum level required to maintain security and service level goals.
Establish and implement a plan to phase in the RACF option PROTECTALL with milestone dates for completing the plan and all phases of the implementation.	D-OARM/RTP	OIG-K-V1/18	Completed	Nov-93	Implementation Strategy for RACF Features completed 6/91, subsequently revised, PROTECTALL fully implemented on 11/30/93.
Identify and delete account users in "revoke" status who no longer warrant system access.	D-OARM/RTP	OIG-K-V1/18	Completed	Jan-94	RACF security admins. now receive reports identifying users in revoke status, and are responsible for USERID management.
Plan and implement a method of periodically reporting to account managers the status of users with RACF profiles assigned under the mainframe accounts for which they are responsible.	D-OIRM D-OARM/RTP	OIG-K-V1/18	Completed	Dec-93	All account managers received RACF training. The training empowers the account managers to obtain RACF profiles as needed.
Determine what highly sensitive files in Agency financial systems and systems processing privacy data would obtain maximum security by utilizing the RACF audit trail and/or ERASE features.	COMPTROL D-OIRM D-OARM/RTP	OIG-K-V1/18	Completed	Nov-93	NDPD has trained account managers how to protect sensitive files. However, NDPD does not have the resources to analyze each mainframe application.
Develop a RACF implementation plan, security objectives, and quality assurance procedures. Include milestone dates for each of these components.	D-OARM/RTP	OIG-K-V1/24	Completed	Jun-91	The Implementation Strategy for RACF Features was completed on 6/91 and subsequently revised. The implementation plan and procedures are completed and are being implemented.
Enhance Agency software to provide for complete and accurate transfer and audit trail of data between the Contract Payment System and IFMS.	AA-OARM	OIG-L-V1/8	Completed	Jun-91	Data are transmitted from CPS to IFMS via an automated nightly cycle. Each morning, personnel review a reject report to address any transactions that did not successfully reach IFMS. On at least a monthly basis, an automated CPS/IFMS reconciliation report is run to verify account balances between CPS and IFMS.
Perform a software assessment to determine if CERCLIS can be altered to provide more flexibility for information retrieval.	AA-OSWER AA-OARM	OIG-N-V1/33	Completed	Mar-93	The software assessment report was published by the Systems Development Center in March of 1993.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Discontinue hard-coding of parameter values subject to change into the source code and replace them with a table that may be read in from a data file unless it can be shown through a cost/benefit analysis that hard-coding is the more efficient and more cost effective approach.	AA-OSWER AA-OARM	OIG-N-V1/33	Completed	Mar-93	Reports using hard coding of parameter values are being phased out at major revision steps of the system.
Establish procedures to include essential reasonableness, completeness, and edit checks in programs to preclude the reporting of erroneous data.	AA-OSWER	OIG-N-V1/20	Completed	Feb-93	This is addressed by the draft report writing manual, published in February of 1993. The manual is scheduled to be completed in final during FY94.
– Signoff upon the completion of report programming with a certification that a 3-way check and comprehensive documentation review has been completed.	AA-OSWER	OIG-N-V1/27	Completed	Feb-93	as above
– Insert comments into the source code and modify the CERCLIS reports library to reflect changes when reports are examined for inclusion in the National Reports Library;	AA-OSWER	OIG-N-V1/27	Completed	Feb-93	as above
– Perform a 3-way check of consistency between the Report Specification Form, the CERCLIS Reports Library, and the source code upon completion of report programming;	AA-OSWER	OIG-N-V1/27	Completed	Feb-93	as above
Require IFMS, FMD, and CERCLIS officials to work together to establish accuracy in IFMS/CERCLIS related data.	AA-OSWER AA-OARM	OIG-N-V1/14	Completed	Sep-92	IFMS, FMD, and CERCLIS representatives have worked together to improve data accuracy. An automated interface to export data from IFMS to CERCLIS has been created, though the interface is not fully operational.
Correct the specific deficiencies identified in this finding.	AA-OSWER	OIG-N-V1/20	Completed	Sep-92	as above
Develop error reports to separately capture inaccurate/incomplete CERCLIS transactions for all reports in production.	AA-OSWER	OIG-N-V1/20	Completed	Mar-93	Production of error reports began in March of 1993.
Take appropriate actions to eliminate the specific deficiencies identified in the five reports discussed in this finding.	AA-OSWER	OIG-N-V1/27	Completed	Sep-92	The reports have all been corrected or archived.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Develop written procedures and controls regarding report programming documentation requiring CERCLIS report owners to:	AA-OSWER	OIG-N-V1/27	Completed	Mar-93	This is addressed in the draft report writing manual, first published in February of 1992, and scheduled to be made final in FY94.
-- Perform a comprehensive review of report programming evaluating adherence to selection criteria standards and documentation standards prescribed by the National Bureau of Standards guidance on software maintenance;	AA-OSWER	OIG-N-V1/27	Completed	Sep-92	This is also part of the draft report writing procedures manual.
Establish procedures to accumulate costs on ADP support services contracts for: (1) ADP equipment; (2) proprietary software; (3) maintenance services; (4) ADP Services; and (5) ADP support services to ensure that the Agency obtains required approvals from GSA.	AA-OARM	OIG-O-V2/30	Completed	Jun-93	OIRM has issued interim policy requiring the accumulation of costs by FIP resource categories as defined by the FIRMR. This requirement is also included in OIRM's draft FIP Resources Acquisition Manual.
Establish senior DOPO/technical manager positions with ADP technical skill requirements commensurate with the skill levels needed to technically monitor the development of ADP DOs and deliverables, or consider the use of independent evaluation contractors to perform the technical reviews of DOs.	AA-OARM	OIG-O-V2/22	Completed	Oct-93	For all national IRM contracts, OIRM performs technical evaluation of delivery orders containing significant IRM content or issues. Upon request, OIRM also provides DOPOs technical assistance in preparing DOs and evaluating contractor performance. Use of GSA zone contracts also ensures independent review of contract delivery orders.
Perform a study to determine the appropriate procurement office staffing to administer the current and proposed ADP support services contracts.	AA-OARM	OIG-O-V2/22	Completed	Sep-93	OAM conducted workload analyses in support of the FY95 budget submission. This analysis addressed current and projected resource needs for properly managing existing and projected ADP contracts for the Agency.
Add to the Agency's contract management program Agencywide mandatory and formal IRM standards, project management guidance, and SDM requirements to efficiently manage ADP support services contracts and information resources.	AA-OARM	OIG-O-V2/22	Completed	Aug-91	The IRM clause was added to the EPAAR in August of 1991. As of 8/92, all current contracts involving FIPS were modified to reflect the EPAAR IRM requirements. The APDS system puts the IRM clause automatically into all new solicitations for FIP resources as a mandatory clause. In addition, IRM training for OAM is currently in development by OIRM.
Separate the duties of Government employees who perform system operations and system security activities.	AA-OARM	OIG-O-V2/7	Completed	Apr-92	As of 4/92, the full-time NDPD Security Officer began reporting to the Director, NDPD, regarding all security matters.

[1] NOTE: See Appendix VII for full citation of reference.

Audit Recommendation	Responsible	[1] Reference/Page	Action Status	Date	Comments
Add RACF protection to the following: all CPS data sets; ADCR budget and obligation data; and all RMIS program, budget, and budget reconciliation data.	AA-OARM	OIG-P-V2/6	Completed	Nov-93	All data sets running on the NCC IBM compatible mainframes are protected by RACF.
Based on the specific job responsibilities, reduce the number of users with: SPECIAL, OPERATIONS, and AUDITOR attributes; ALTER access to data sets controlling RACF; ALTER access to operating system data sets; ALTER access to IFMS and MPAY; and GRPACC capabilities and CREATE authority in several groups.	AA-OARM	OIG-P-V2/7	Completed	May-93	The number of individuals with high level system RACF attributes has been reduced to a minimum.
Develop performance standards for system software maintenance, security administration, and DASD management and require the contractor to develop and document specific procedures to meet the standards.	AA-OARM	OIG-Q-V2/53	Completed	Jun-93	NDPD developed an MVS procedures manual (6/93) and a DASD management plan (2/93) that cover the issues in this recommendation.
Based on specific individual job responsibilities, reduce the number of users with: *a. SPECIAL, OPERATIONS, and AUDITOR attributes;* *b. ALTER access to data sets controlling RACF;* *c. ALTER access to operating system data sets; and* *d. GRPACC capabilities and CREATE authority in several groups.*	AA-OARM	OIG-Q-V2/15	Completed	May-93	The number of individuals with high level system RACF attributes has been reduced to a minimum.
Develop information security policies, standards, and procedures for data protection, including:			Completed	Nov-92	NDPD created the Application RACF Security Administrator's Guide, which addresses many of the following topics:
a. determining the level of protection required under RACF;	AA-OARM	OIG-Q-V2/14	Completed	Nov-93	NDPD provides comprehensive recommendations on these topics as part of training other organizations to become RACF aware. Agency directives 2195 and 2197 are also
b. developing RACF profiles which provide protection while maintaining adequate internal controls such as separation of duties; and	AA-OARM	OIG-Q-V2/14	Completed	Nov-93	responsive to these recommendations. Training for almost all of the Agency accounts was completed by 11/93.
c. develop and publish standards of performance for information security, with specific attention to utilization of RACF to protect sensitive data on the IBM systems.	AA-OARM	OIG-Q-V2/14	Completed	Feb-93	NDPD has complied with item c) through the NDPD Operational directives.

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Strengthen NCC security policy to define: *a. controls over sensitive application data;* *b. Controls over access to operating system data sets to include requirements for minimum access authority;* *c. controls over powerful RACF privileges; and* *d. division of responsibilities for RACF administration.*	AA-OARM	OIG-Q-V2/15	Completed	Feb-93	The NDPD security policy has been updated to reflect the OIG recommendations.
Update written policies, standards, and procedures for systems software activities to include proper APF administration and SVC installation. The policies should include the requirement to preserve IBM system integrity, and follow vendor guidelines for maintaining system integrity.	AA-OARM	OIG-Q-V2/24	Completed	Jun-93	NDPD has developed the MVS Standards and Procedures Manual, which addresses these issues.
Issue a requirement that all support services contracts incorporate performance requirements that meet the intent of OMB A-76 performance-oriented work statement and quality assurance surveillance plan.	AA-OARM	OIG-Q-V2/53	In progress	Jul-93	The TOSS Task Force reviewed all TOSS SOWs to ensure the use of performance-oriented requirements. This requirement is also spelled out in the PIP Resources Acquisition Manual, to be issued as final in 2/94. NDPD requires that all support services contracts comply with Circular A-76 requirements, including those regarding performance-oriented work statements and QA surveillance.
Separate the duties of Government employees who perform system operations and system security activities.	AA-OARM	OIG-Q-V2/14	Completed	Apr-92	As of 4/92, the full-time NDPD Security Officer began reporting to the Director, NDPD, regarding all security matters.
Establish a high level IRM Steering Committee which acts as a decision-making body for significant IRM activities, headed by DA or DSO with members being senior executives with authority to commit offices to action.	DA-EPA	OIG-R-V2/19	Completed	Dec-92	Steering Committee charter has been revised to reflect AA/OARM as chairman. Further refinements to charter and Committee membership in progress. AAs scheduled to meet with the AA/OARM in January '94.
Formally designate a DSO in accordance with the PRA at the AA level.	A-EPA	OIG-R-V2/19	Completed	Dec-92	AA/OARM was formally designated as Agency's Senior Official for IRM in Delegation 1-84
Delegate the authority and responsibilities for all the IRM functions to the DSO in accordance with the PRA, and clearly define any redelegations.	A-EPA	OIG-R-V2/19	Completed	Dec-92	Delegation 1-84 redelegates specific portions of the IRM program to OPPE.
Establish a clear chain of command under the DSO for all IRM activities, especially between OIRM and NDPD.	DA-EPA	OIG-R-V2/19	In progress	TBD	Further revisions to Delegation 1-84 have been drafted to establish a clear chain of redelegations to the office level.

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Develop a comprehensive Agencywide oversight and enforcement program which focuses on software quality and the system development life cycle and which at a minimum should include... *a provision of training on information system quality assurance.*	AA-OARM	OIG-R-V2/58	In progress	Jul-93	The MOSES program has presented briefings on the System Devel. Ctr. product development process, which describe the product assurance process during development of deliverables. A 3-day class on managing software requirements and the role of product assurance during a software project has been presented twice. Another 3-day class, more focused on product assurance, is being considered for presentation during FY94. These offerings are being considered for training components of a comprehensive Agencywide oversight and enforcement program. OIRM has also established the oversight and QA function in the Oversight and Compliance Support Staff in OIRM/MES, which ensures new acquisitions comply with EPA policies.
Establish a formal, Agencywide, integrated planning process for the direction, coordination, and control of IRM activities and resources that will provide management involvement and accountability at all levels, which at a minimum should include the:	DA-EPA	OIG-R-V2/46	In progress	Jan-94	The IRM Planning Group was established to develop these functions. In addition at a Jan. '94 meeting of the AAs, they agreed to directly work on an IRM Strategic Plan for the Agency.
a. Development and implementation of an action plan to accomplish Agencywide mission-based bottom-up IRM planning.	DA-EPA	OIG-R-V2/46	Completed	Apr-93	The action plan was completed in April of 1993. It is currently being implemented.
b. Establishment of an evaluation and review process for program offices' IRM mission-based plans to ensure the plans support a consolidated Agencywide mission-based IRM plan.	DA-EPA	OIG-R-V2/46	In progress	Nov-93	Formal procedures are under development. Responses to the 1993 integrated data call for IRM planning and budgeting are currently being reviewed and will be part of the Agency IRM Strategic Planning process.
c. Integration of the responsibilities for IRM planning and budgeting.	DA-EPA	OIG-R-V2/46	In progress	Dec-92	The revised charter of the Executive Steering Committee for IRM integrates these responsibilities at a high level, as did formal designation in December 1992 of the AA/OARM as EPA's Senior Official for IRM.
d. Modification of the methodology for IRM planning to include clear policies and procedures for linkage of the planning and budgeting processes.	DA-EPA	OIG-R-V2/46	In progress	May-93	The formal procedures are currently in development. The Agency's first integrated IRM planning and budget data call was issued in 1993, and is currently being analyzed.

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Develop a comprehensive Agencywide oversight and enforcement program which focuses on software quality and the SDLC and which at a minimum should include the:	AA-OARM	OIG-R-V2/57	In progress	TBD	The Systems Development Center was created to emphasize the development of high quality information systems. Under EPA direction, the MOSES contractor has developed a quality assurance program and has created a separate QA group within the SDC, reporting directly to the program manager. Product assurance procedures are being developed, documented and practiced, and will be refined over the life of the MOSES contract. It is OIRM's intention that such procedures will be broadened for adaptation to other EPA IRM contracts.
Development and implementation of an action plan to accomplish Agencywide quality assurance for major information systems.	AA-OARM	OIG-R-V2/58	In progress	TBD	
Establishment of an oversight and enforcement function to be responsible for the overall information systems quality assurance program to include independently reviewing and evaluating major information systems.	AA-OARM	OIG-R-V2/58	Completed	Jul-93	The oversight and quality assurance function has been established in OIRM/MES and implemented by the Oversight and Compliance Support Staff. This Staff ensures new acquisitions comply with EPA policies for information systems design, development, and maintenance. In addition, OIRM assures compliance and adherence to appropriate lifecycle practices for projects run under the MOSES contract for national systems development. Finally, starting in FY94, OIRM will initiate systems reviews to monitor compliance with Agency and Federal IRM policies & stds.
Formalize and prioritize a plan for developing and revising policies, standards, and procedures which addresses the issues presented in this finding, which also include the following actions:	DA-EPA	OIG-R-V2/35	Completed	Jun-93	A comprehensive IRM policy workplan has been developed and is being used as the basis for prioritizing revision of IRM policies, standards, and procedures.
Review existing IRM guidance documents and incorporate them as necessary into IRM policies, standards, and procedures under Directive 1315.	DA-EPA	OIG-R-V2/35	Completed	Jun-93	OIRM coordinated with NDPD and SIRMOs to review existing guidance documents and formalize a plan for developing and revising policies, standards, and procedures. The plan identifies subject matter experts and sets priorities.
Immediately issue temporary directives for informal guidance and standards as set forth in Directive 1315 on critical IRM guidance documents until green border review can be performed.	DA-EPA	OIG-R-V2/35	Completed	Apr-93	OIRM developed a list of candidate policy documents to be issued as temporary directives, had this list reviewed by the Agency IRM community, and had a set of 8 critical IRM policy documents approved as formal directives on 4/30/93
Develop additional comprehensive, formal, authoritative, IRM policies, standards, and procedures which would cover all minimum Federal and EPA IRM requirements.	DA-EPA	OIG-R-V2/35	Completed	Jun-93	Two additional policies recently completed include a policy on access to computer equipment by the disabled, and a policy on use of electronic signatures within EPA. Additional policies have been drafted on topics such as telecomm., background investigations for IRM contractors, HW/SW standardization, and systems lifecycle mgmt.

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Updating and establishment of clear policies, standards, procedures, and guidelines on information systems quality assurance and incorporation of them into formal EPA directives.	AA-OARM	OIG-R-V2/58	In progress	Jun-94	Draft of system lifecycle mgmt. policy is in pre-green border review. Procedures and guidelines will be developed to complement the policy. The current system design and development guidance was issued as temporary Agency directive 2182 in April 1993.
Establish and maintain a central repository for IRM policies, standards, procedures, and guidance.	DA-EPA	OIG-R-V2/35	Completed	Feb-93	Copies of documents in the IRM policy document inventory are maintained in OIRM/IMSD. OA/MOD retains the central repository of all official Agency directives and is currently in the process of examining all directives as part of the administration's streamlining initiative.
Include segments on managing electronic records in Agency records management training sessions. In addition, develop presentations for IRM officials and program staff responsible for electronic records systems that inform them of their responsibilities in relation to electronic records, particularly in terms of building in maintenance and disposition at the system development phase, and of creating and maintaining appropriate documentation.	A-EPA	EPA-A/52	Completed	Dec-93	An electronic records segment has been included in the standard records management training given to program staff. We made many presentations to IRM branch chiefs, SIRMOs, etc., on electronic records management and developed records disposition schedules for most information systems listed in the Agency's information systems inventory. We featured elec. records mgmt. concerns in the 4/92 issue of INFOACCESS, and included other articles on elec. records mgmt. policy in other issues. We plan to develop a 2-hour training session for all records managers on electronic records for FY95.
Revise and expand the guidance for creation, maintenance and use, and disposition of electronic records already in place to make it more complete and current. In particular, incorporate, as appropriate and in a form applicable to EPA, the guidance in NARA's regulations on electronic recordkeeping, found at 36 CFR 1234, and in NARA's handbook entitled "Managing Electronic Records." Ensure that records maintained on all types of systems are included. As part of the EPA directive system, this guidance should be dessiminated to all records managers and administrators and IRM staff, both in headquarters and the field. Clear assignment of responsibility for developing and maintaining documentation for electronic records should be included in the directive.	A-EPA	EPA-A/51	Completed	Dec-93	We included revised wording on managing electronic records in the revised version of Ch. 10 of the IRM Manual (records management) scheduled to go through green border review in FY94. We completed a study of existing policy, procedures, and guidance on electronic records that indicates areas where our policies need improvement. We plan to revise Ch. 8 of the Agency Records Management Manual (Directive 2160) during FY94, and prepare it for informal review during FY95. We distributed copies of NARA's "Managing Electronic Records" to all records officers and SIRMOs.

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Develop a process to ensure IRM considerations get addressed during development of proposed regulations, and information collection requests (ICRs) by engaging OIRM participation in the Agency Steering Committee and associated regulatory workgroups. A integral component of the review should focus on whether the collections are in compliance with established Agency IRM policy and standards.	D-OIRM	EPA-B/18	In progress	TBD	OPPE is leading an effort to revise the regulatory development process. The existing process did not emphasize up front analysis, or training, tools, and guidance for workgroup chairs or participants regarding IRM issues. OARM reps. have been actively involved with the workgroups developing proposals for the new process. Our approach is to push for strong upfront guidance for workgroup chairs and participants, coupled with an evaluation program that allows us to determine where additional guidance or tools are needed. We will maximize the impact of our experts by providing lists of contacts on specialized issues to workgroups upfront so that they can access experts on an as-needed basis.
Establish more formally designated roles and responsibilities for all members of the Agency IRM community, reflected in performance standards.	D-OIRM	EPA-B/9	under consideration	TBD	The model IRM program study will define approp. roles and responsibilities for the SIRMOs, and in so doing will show the relationships between the various elements of the IRM community. More attention would need to be focused on central IRM's specific roles and responsibilities for adequate perf. standards to be developed for the entire community.
Require AA/RA-level reviews of all office/regional IRM organizational structures and require formal designation of authority and responsibility for all positions in these structures.	D-OIRM	EPA-B/9	under consideration	TBD	Decisions on implementation of the model IRM program will probably result in review of AA-level IRM structures and responsibilities. Top management support will be required to formally designate authorities and have them implemented. There is a model for the Regions that appears to be working, but this has not been addressed in the program office model IRM study.
Develop a model of a recommended IRM organizational unit in program offices.	D-OIRM	EPA-B/9	In progress	May-94	The model will include recommended IRM organizational unit placement, staffing, and functions for program offices. The model will be drafted by the end of January, and will be shared with the IRM community in Spring, after review and approval by OIRM/IMSD.
Revisit and redefine SIRMO concept, PDs, and performance standards in light of the SIRMO's threefold role: Information conduit, approval authority, and technical resource.	D-OIRM	EPA-B/9	In progress	May-94	In essence, the SIRMO concept gets defined in the model study. Responsibilities of the IRM unit in program offices will be defined by function, thus these could serve as the basis for job descriptions and functional statements.

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Establish a scalable, flowcharted review and approval process for information system development projects, focusing the review on projects involving high dollar and/or mission critical systems. Inherent in this recommendation is the need to clearly define the thresholds of projects requiring OIRM/SIRMO review.	D-OIRM	EPA-B/15	In progress	TBD	This review and approval process is described in the draft system lifecycle management policy. Thresholds are clearly spelled out, as are the reviews by SIRMOs, central IRM offices, and the Executive Steering Committee for IRM.
Define criteria and thresholds for system development/enhancement efforts requiring joint OIRM/SIRMO formal review/approval. This includes new system development initiatives and/or major changes to existing systems. Joint review and approval at designated intervals will involve review of the life cycle products and documented decisions to proceed or not proceed with the proposed work, and conclude with the formal decision to retire an information system. It should be noted that the review of the project management plan for all system development and enhancement efforts should address the need to comply with IRM policies and standards.	D-OIRM	EPA-B/18	In progress	TBD	Criteria and thresholds for system development and/or enhancement efforts are clearly spelled out in the draft systems lifecycle management policy. The project management plan is one of the most important documents referenced in the policy.
Provide tailored IRM training for various groups, based on levels of need and areas of responsibility. Target groups include:	D-OIRM	EPA-B/13	In progress	Various	Dates for specific training courses vary.
System development Delivery Order Project Officers and Work Assignment managers;			Completed	Jan-94	The Sys. Devel. Center established under the MOSES contract is required to operate based upon standard operating procedures which describe how projects receive technical direction from DOPOs, limits on such direction, and controls over the deliverable development process. The contractor has briefed DOPOs on how work flows through the SDC & more briefings are scheduled. We are considering making the briefing mandatory training for MOSES DOPOs. (Other components may be determined by OAM in addition to the current general DOPO training requirements.) In addition over 15 DOPOs attended a 3-day course on the importance of clearly stating requirements, controlling changes to req'ts, and the interaction between requirements, design, the software being developed, and quality assurance.
Contractors working on system development dealing with issues that are EPA-specific; and			In progress	Jan-94	Beginning in Jan. 1994, SAIC will be providing its MOSES contract employees with information security training. These sessions will continue until all MOSES contract employees have received training.

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(continued...) *Program staff developing regulations involving information collection.*			Completed	Jan-94	Briefings will be offered in January to program managers at the office director, division director, and branch chief levels on the Paperwork Reduction Act, its goals and requirements, the ICR process, and how to comply with the Act. Direct training is also provided to reg. workgroups upon request to supplement what they learn from reading the ICR manual.
Decrease EPA's dependence on contract services, increase the ratio of EPA to contract personnel, and increase the number of Agency IRM FTEs by initiating a concerted effort to plan for, justify and request a significant increase in Federal IRM FTEs.	D-OIRM	EPA-B/20	In progress	TBD	EPA's actions to correct a declared material weakness in IRM planning will support the development of Agency and program IRM plans that can provide solid justification for requesting additional FTEs. Efforts are also underway to investigate possibilities for converting IRM contractor funds to FTEs.
Require that Agency programs develop mission-based IRM plans which will clearly identify IRM expenditures in their annual budget and operating plans.	D-OIRM	EPA-B/6	In progress	Nov-93	Formal procedures to require this are being developed. Program offices were required to submit budget, mission, and acquisition information for the first integrated data call.
Develop specific policies and processes to ensure that Agency IRM systems developed under any EPA contract comply with Federal and EPA IRM policies and standards. Make certain that IRM work under these contracts which is considered incidental to the support of the contract effort is only for the contractor's internal use and will not be transferred to Agency personnel or programs.	D-OIRM	EPA-B/6	Completed	Aug-91	The IRM clause of the EPAAR requires that systems developed under any Agency contract must comply with Federal and EPA IRM policies and standards. In addition, the APDS system puts boilerplate language for IRM automatically into all new solicitations for FIP resources, as a mandatory clause.
Require that all EPA contract, grants and interagency agreements must include provisions for compliance with EPA and other Federal IRM policies.	D-OIRM	EPA-B/18	Partially Completed	TBD	All contracts must include provisions for IRM compliance. Grants and IAGs are now addressed on a case-by-case basis, and may not be readily amenable to a comprehensive solution.
Review all Agency IRM policies, standards, and guidances at regular intervals to identify gaps and ensure they are in line with current Federal requirements and support the Agency's primary goals and objectives.	D-OIRM	EPA-B/5	Completed	May-93	All policy documents were reviewed to identify gaps during creation of the IRM policy workplan
Establish a standard, formal process for issuance, periodic review, and maintenance of IRM policies, standards, procedures, and guidance which shall include review by program and regional office staff having functional IRM duties and responsibilities.	D-OIRM	EPA-B/5	Completed	Jun-93	The Agency's formal green border review process is the standardized issuance process. The IRM policy workplan provides the framework for periodic review and maintenance of the IRM policy documents.

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Create/maintain an effective online system to disseminate all IRM policies (including cross-references, purpose, issuing organization, points of contact, review date, and compliance requirements).	D-OIRM	EPA-B/11	In progress	Sep-93	Many IRM policy documents are now disseminated electronically via NDPD's EPADOC CD-ROM. Options for on-line distribution are being investigated and piloted by OA/MOD.
Assess user needs for the IDEA system, including analytical capabilities; develop a formal test plan; properly test existing software; and document the IDEA system design and software before developing additional software for the system.	AA-OE	GAO-E-V1/13	In progress	Sep-94	The IDEA systems documentation was completed as of 9/93 and is available in a documentation library. IDEA software undergoes extensive testing at several levels before it is moved into production. Software is tested by the developer, other programmers, trainers and user support staff, and end users. Programs are moved into production only after there is unanimous consent of the developers and testers that no bugs exist and that the requirements are met as designed. A written description of the testing methodology and approach is under development; completion will depend on obtaining additional contractor resources and staff to devote to articulating existing testing methods. Correction of identified weaknesses relating to testing is scheduled to be completed as of the third quarter of FY94.
Address data quality problems in the FINDS redesign project by setting standards for accuracy, completeness, and timeliness and by developing a plan for the maintenance of the system.	AA-OARM	GAO-E-V1/13	Completed	Oct-93	The FINDS management team conducted an audit of FINDS data during FY93 that confirmed and quantified data quality concerns. A final audit report including recommendations was completed on 10/30/93. The audit results provided a basis for estimating the resources needed to improve the quality of FINDS data. Many of the audit recommendations have been addressed by implementing FINDS version 2.0, placed in production in 9/93. The FINDS 3.0 data management phase, scheduled to go into production in 3/94, will also address data management recommendations identified in the audit.
Develop an Agencywide plan to improve cross-media data quality including setting, implementing, and enforcing data standards and developing and maintaining a comprehensive data dictionary.	A-EPA	GAO-E-V1/14	In progress	Sep-94	OIRM has established an Information Management/Data Administration (IMDA) Group to plan EPAwide improvement of data administration practices including setting, implementing, and enforcing data standards. The IMDA Group will also initiate development of a repository of standard EPA data elements and data models. The group is working with ANSI and ISO committees to develop voluntary data standards, of which versions have been drafted for EPA use. A registry of nonstandard data elements is under development, as the 1st of 3 phases of developing a dictionary of standard data elements. A data standardization service center is being established.

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Develop an Agencywide information systems architecture that explains the structure of and communications among the Agency's information resources that are needed to achieve its single- and cross-media mission.	A-EPA	GAO-E-V1/14	In progress	Sep-94	The IMDA Group is leading the effort to develop an info. architecture for EPA, with initial concentration on a data architecture. The IMDA group is taking an approach based on the Zachman Framework for Information Systems Architecture. John Zachman has given a presentation to OIRM and program office staff. Work is underway to specify the expected content of the architectures for EPA and to prepare a development plan. Since this is an expensive task requiring involvement of many EPA staff, an education effort has been started by inviting a nationally recognized speaker to present the business case for architectures to EPA staff. Also in preparation for this work, several EPA staff have attended Zachman and related seminars on information system architectures. Planning and education efforts will continue in FY94, with architecture development being initiated in FY95.
Complete the Agency's cross-media strategy by developing policies and guidance and instituting management procedures to plan, coordinate, and budget for cross-media information resources and activities.	A-EPA	GAO-E-V1/13	In progress	Jan-94	The IMDA Group's work to develop an Agency data administration policy is supportive of this recommendation. The draft policy will begin green border review during FY94. During FY93 work was initiated to define conceptual, logical, and physical level models for EPA and to develop quality metrics for them. Procedures for reviewing these models are currently under development. Recent articles also indicate that the White House Office of Environmental Policy and OMB are discussing incorporating ecosystem planning issues in budgeting, and a possible exec. order on ecosystem management that would encourage interagency, state, and federal cooperation. Admin. Browner has created a sr. mgmt. workgroup on ecosystem protection, which will present recommendations to Browner by 3/15.
Strengthen OPP's conformance with federal guidance and generally accepted practices for automated systems development so that OPP's information systems are consistently planned, developed, and enhanced. As part of this effort, OPP should ensure that the pesticide information needs of all users involved in administering and managing EPA's pesticide reregistration process are defined and linked to an overall program management plan.	AA-OPPTS	GAO-H-V1/8	Completed	Jul-93	Developing a multi-year OPP/OCM strategic planning process and linking this process with OPP's budgetary process in FY92 and FY93 has created a cross-divisional path for IRM project planning and resource allocation and is a major step toward ensuring overall program office mission goals and objectives are reflected in OPP's IRM activities. In addition, this planning provides IRM project managers with somewhat more realistic and timely information about expected mission timetables and resources for developing full-scale IRM project plans. This greatly facilitates system lifecycle management and contributes to more fully coordinated and controlled systems development.

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Establish data management policies and implement a plan with milestones for resolving OPP systems' data integrity problems.	AA-OPPTS	GAO-H-V1/8	Completed	Jul-93	The central issues in OPP's data mgmt. process are being addressed in two major integration efforts that follow the goals in the OPP/OCM strategic plan. These 2 teams span organizational lines and involve both clients and developers. The teams reflect data environment lines, with core enterprise data addressed in one team and activity tracking data in the other. The data management issues that led to a decision to launch full-scale integration efforts are these: * core data in our systems is being derived from multiple sources -- leading to data validity problems * core data in our systems is variously defined, both from a system design and from a logical use standpoint -- leading to data reliability and interpretation problems. * multiple update streams and non-synchronous update timing across systems leads to data validity problems. All these issues as well as system architectural issues are being addressed in a standard controlled systems lifecycle management approach, with full-scale documentation and an OPP-wide data dictionary.
As OPP moves toward systems integration activities, ensure that requirements analyses, feasibility studies, and cost/benefit analyses are conducted to support OPP's automated systems solutions.	AA-OPPTS	GAO-H-V1/8	Completed and Ongoing	Jul-93	In 1993, OPP integrated three different pesticide reregistration systems (ALISS, SMARTS, and DCI system) into one system called the Chemical Review Management System (CRMS). For this system, a requirements analysis and a feasibility study were completed prior to developing the system. The cost/benefit analysis is in progress and will be completed shortly. The other systems lifecycle documents were prepared in accordance with EPA Directive 2182, on systems design and development. The office plans to follow Agency policy and standards as it moves forward with other integration projects in 1994.

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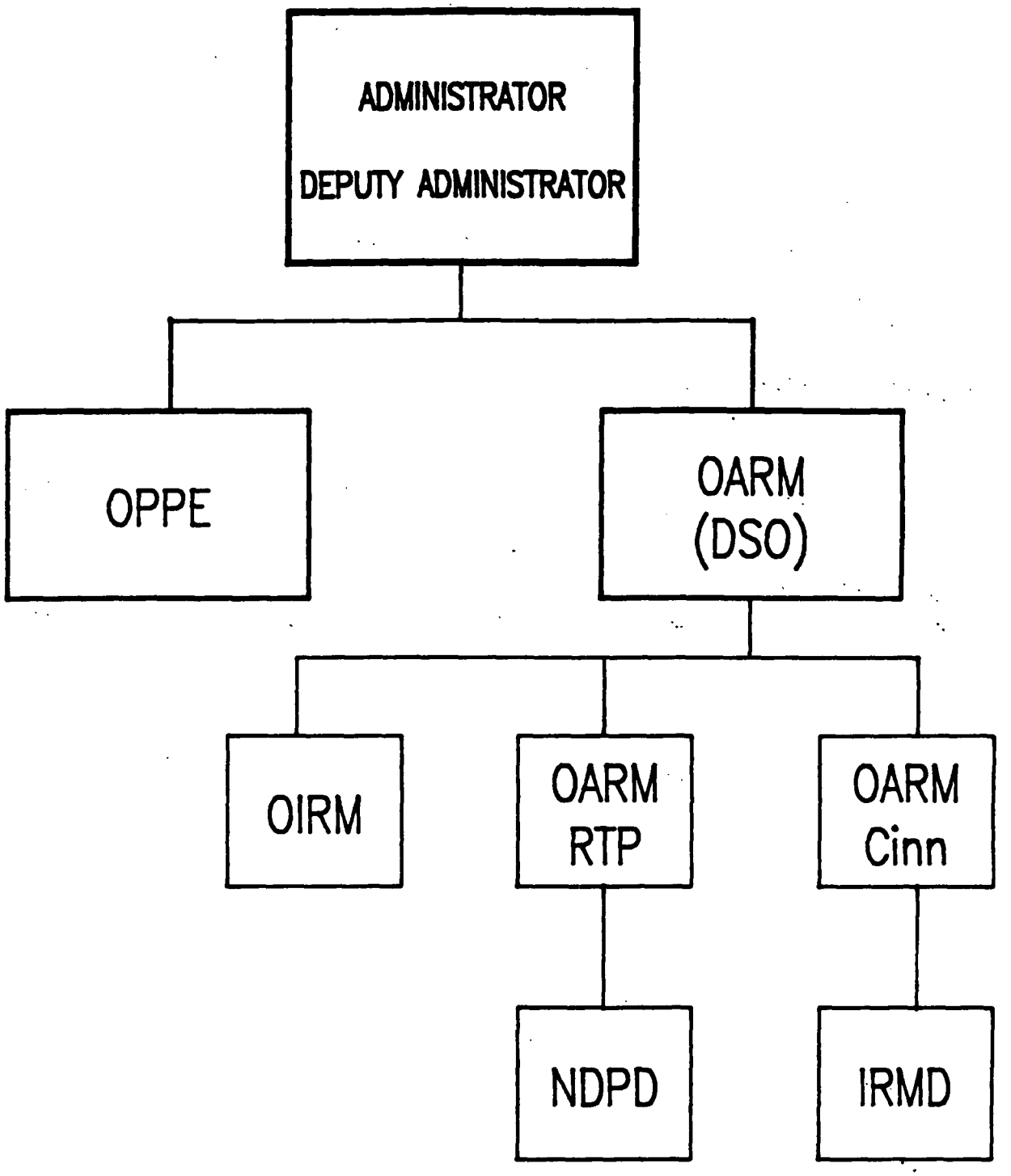
Take appropriate steps to enhance its information system development process and fully ensure that data collection efforts complement each other and support the program mission. Specifically, a comprehensive data collection plan should be developed. Steps should be taken to improve the assignment of responsibilities for planning and directing the development of information system components by increasing the authority of the central coordinating office to develop data collection efforts and ensure consistency. Finally, the life cycle management system should be refined to ensure the complete and detailed analysis and documentation of each stage of the cycle for major system components.	AA-OSWER	GAO-K-V1/39	Completed	Oct-92	The Agency prepared an amendment to the biennial report regulations that would have ensured that all states collected consistent data on hazardous waste generation and mgmt. This amendment would have required consistent data collection and would have enabled more consistent national reporting of the data. However, EPA has decided to defer the rule until after the 1993 and 1995 data collection cycles are complete. Per discussions with States and other interested parties, EPA has hypothesized that collection of consistent data will not require a change to the regulation, but rather nation-wide use of a consistent form for data collection and system for data entry. In 1987, 18 states were using the BR forms. In 1991, 47 states used the BR form. The Agency has followed all important lifecycle management procedures.
Ensure that state data collection and quality control efforts receive fully adequate support and include specific indicators related to data collection and verification in the Agency's mechanism for monitoring state performance.	AA-OSWER	GAO-K-V1/103	Completed	Oct-92	The Agency developed improved biennial reporting data entry and report software for the states which improved state data collection and data quality control efforts. The Agency developed an amendment to the federal recordkeeping and reporting regulations so that states would be required to collect and provide standard data elements, and hazardous waste handlers would be required to provide sufficiently detailed data. However, EPA has decided to defer the rule until after the 1993 and 1995 data collection cycles are complete. Per discussions with States and other interested parties, EPA has hypothesized that collection of consistent data will not require a change to the regulation, but rather nation-wide use of a consistent form for data collection and system for data entry. In 1987, 18 states were using the BR forms. In 1991, 47 states used the BR form.
Amend federal recordkeeping and reporting regulations so that states are required to collect and provide standard data elements in a disaggregated form and hazardous waste handlers are required to provide sufficiently detailed data.	AA-OSWER	GAO-K-V1/103	Completed	Oct-92	
Ensure that the toxic chemical release inventory reporting system complements other hazardous waste data collection efforts so that the data it provides on toxic chemical concentrations can be used to their maximum potential.	AA-OSWER	GAO-K-V1/103	Completed	Oct-92	The Agency undertook a year-long study of possible linkage between BRS and TRI. The result of this effort was to show a less than 25% overlap in facilities reporting.
Ensure that the new accounting system and property control system (1) provide accurate and reliable financial and management control records (including the type of asset, date of acquisition, cost estimated useful life, applicable depreciation data, physical location, and identity of custodial officers) to account for and control property assets and (2) contain a common data element(s) or interface(s) to permit the reconciliation of accounting and property systems data.	A-EPA	GAO-B-LIB/19	In progress	Sep-93	FMSD and FMD convened a quality action team (QAT) during FY93 that examined requirements for a combined property and financial accounting system, and recommended acquiring an additional module of commercial software (the PFS fixed assets module). The final decision on acquiring the module is still pending.

[1] NOTE: See Appendix VII for full citation of reference.

EPA OFFICES WITH MAJOR IRM RESPONSIBILITIES



STRENGTHENING IRM AT EPA

OFFICE OF INFORMATION RESOURCES MANAGEMENT

Issue Paper Updated February, 1994

Background: This Issue Paper was provided by OIRM officials to show the reader the aggregate, collective efforts the IRM community is undertaking to improve information management at the Agency. It presents a summary of many of EPA's current IRM improvement initiatives, and gives a brief description of the context in which they were developed.

Introduction

The purpose of this paper is to present the IRM improvement program and our overall strategy for addressing weaknesses that have been identified with EPA's IRM program. The paper is characterized as "strengthening" the IRM program, not building anew, since many of the components for a solid IRM program are in place, and some have been judged in the past to be excellent.

Historical Perspective

The EPA IRM program parallels the structure and operating philosophy of EPA as a whole - centralized planning, policy, and oversight, and decentralized implementation.

This modus operandi served the Agency fairly well in providing systems to support the numerous stand-alone environmental statutes and programs. To support this arrangement, OIRM invested limited resources in planning, policy, and oversight, and applied the bulk of its resources to services that supported implementations, or to implementations directly.

Two factors began to emerge in the late 1980's that have made the traditional EPA approach to IRM less effective. One, the Agency's business has been informally changing to be more oriented to cross-media and integrated approaches. Using the traditional EPA model and emphasis, IRM has not been able to support this new business very well. Second, several statutes and implementing regulations focused on improving Federal IRM were issued or amended (Paperwork Reduction Act, Computer Security Act, A-130). These authorities require a stronger central IRM presence in EPA. Despite these two factors, EPA OIRM has had difficulty disengaging from its services and implementation work and reorienting resources towards the strongly central activities of planning, policy. and oversight. Recent budgetary pressures have lead to reduced OIRM budgets, and have further hampered this reorientation.

Accomplishments

Despite the effect of several areas of concern, and a historical IRM strategy that may not provide the basis for providing strong support to the Agency's strategic direction towards integrated, cross-media analysis, the IRM community has achieved a number of notable accomplishments. Below are listed some selected, representative examples:

- Implemented the Systems Development Center to improve EPA systems through development methods and discipline.

EPA received an award from "Government Computer News" recognizing this effort.

- Installed a supercomputer to support environmental research at EPA's new facility at Bay City Michigan.

- Operated the National Computer Center at a level of efficiency, as adjudged by industry expert Nolan, Norton and Company, in excess of 10% more cost effective than the norm for data centers of like size.

- Established, out of base, a unit dedicated to establishing the framework for data management in EPA, and developed a set of initial standards. This key activity is establishing the "rules" required to support data integration across EPA programs and with the outside world.

- Established disaster processing capabilities for three key information systems in EPA, to enable EPA to continue to operate as an organization if the data center experienced an incapacitating event. EPA received an award from "Government Computer News" recognizing this achievement.

- Developed and installed in a number of offices in HQ and the Regions the Office Forms Facilitator (OFF) suite of systems to enhance the productivity of EPA offices. A January 1994 study of OFF usage in typical office settings documented significant productivity gains and efficiency improvements for the administrative processes automated by the system.

As an overall indication that the EPA IRM community has managed the overall program quite well, Congressman Jack Brooks, former Chairman of the House Government Operations Committee, was quoted in "Government Computer News" several years ago as indicating that EPA was one of a select few agencies "doing a good job" in acquiring and using computer and communications systems and services.

Areas of Concern

The OIG has repeatedly identified IRM as a candidate for consideration by the Senior Council on Management Controls as a material weakness. GAO has also identified IRM weaknesses as contributing to problems the Enforcement and Pesticides programs have encountered in performing their missions.

In reviewing the work and conclusions of such oversight organizations, OIRM has organized the primary IRM concerns into five areas: 1) **IRM Planning** - This area includes creating a 5-year IRM plan and integrating that plan into the budget process; 2) **Formal IRM Policies** - This area focuses on formalizing through the green border process a number of policies/standards/etc. with Agencywide impact, developing additional policies to cover some identified gaps, and improving communications, training, and assistance for those affected by the policies; 3) **IRM Security** - This area deals with creating a comprehensive security program which assures cost-effective protection of sensitive Agency information, by focusing on training and oversight, covering a few policy gaps, and improving the mainframe environment at NCC by enhancing certain general controls; 4) **IRM Quality Assurance/Oversight** - This item focuses on enforcement of IRM policies pertaining to system development, operations, and maintenance, and evaluating systems' effectiveness; and 5) **IRM Contracting** - This area deals with formalizing controls to ensure IRM contracting is conducted efficiently and in accordance with Federal regulations, both during the pre-award phase of acquiring Federal information processing (FIP) resources and throughout contract administration.

OIRM has examined and evaluated these five areas in accordance with EPA's material weakness criteria. On the basis of these analyses, OIRM acknowledged that all five areas have certain weaknesses. In the case of IRM Planning and IRM Security, OIRM deemed them to be sufficiently material to be reported to the President (see the Administrator's December 1992 FMFIA letter). In the case of IRM Policies, IRM Quality Assurance/Oversight, and IRM Contracting, OIRM deemed the weaknesses to be serious, but not of sufficient importance to report to the President, and has declared these weaknesses at the Agency-level. Corrective action plans have been developed and are being implemented.

The Improvement Program

OIRM is vigorously addressing, in cooperation with the Agency IRM community, the underlying circumstances that have resulted in these areas of concern by working in five key areas:

1. **Revising the OIRM Emphasis** - Historically, OIRM has been substantially invested in activities related to implementing systems. This emphasis has diverted resources from the traditional functions of a Federal IRM organization of planning, policy, and oversight/review.

The lack of emphasis on these stewardship functions of policy, planning, and oversight has contributed to certain

weaknesses in the IRM program. To address this matter we are taking several actions:

- We declared IRM planning a material weakness, immediately bolstered our planning function, and established an action plan to create a 5-year IRM plan for EPA that is linked to the budget. The first planning cycle will be completed in February 1994. In addition, with our support, the Assistant Administrators gathered in January 1994 and initiated work together on IRM strategic planning. At the same time, a subgroup of the National Advisory Council on Environmental Policy and Technology was used to engage the Agency's external stakeholders in IRM strategic planning activities.

- Out of base resources, we placed senior, experienced IRM staff at the lead of our information security program. We have developed, and are supporting, a network of information security officers for information technology installations across the Agency. We have launched a solid security awareness training program and ensured that every data set on EPA's mainframe has been evaluated, with a security decision made by its owner, regarding the appropriate level of protection to be implemented via the Resource Access Control Facility.

- We have increased attention to the IRM policy area. To date, we have inventoried all Agency IRM policies, standards, procedures, and guidance, created a prioritized listing of additional policies needed, and formally issued a number of key IRM documents as temporary Agency directives. We recently established Agency policies on access to computer equipment by the disabled and on use of electronic signatures within EPA. We are currently revising the Agency's systems life-cycle policy and guidance, telecommunications policy, and information security-related policies. We are developing anew EPA hardware/software standards and policy, a comprehensive data administration policy, and a policy requiring appropriate suitability investigations for IRM contractors. In the spirit of the National Performance Review, we are focusing our policies more on desired, measurable outcomes (the "what"), and less on specific procedures (the "how").

- We established an organization to review IRM acquisitions, major systems, and IRM organizations in the Agency. This organization has comprehensively reviewed, to ensure inclusion of relevant IRM controls, all requests for procurement (RFPs) for FIP resources and all

delivery orders for OIRM-provided national IRM contracts. We have implemented, at our Systems Development Center under the MOSES contract, a very thorough set of operating principles, policies, and procedures that ensure good contracting practices, improved planning, and useful, high-quality deliverables.

- To more clearly identify the functions that need to be performed in EPA to ensure good IRM is practiced, last Fall we initiated an IRM business planning effort. After the functions of IRM, both for central organizations and the programs/regions, are clearly established, OIRM will examine its current organization to determine if any changes are necessary to support the central responsibilities. If so, a formal reorganization will be proposed.

2. **Assuring Senior-level Engagement in IRM** - We formalized the delegation from the Administrator to the Assistant Administrator for OARM establishing the AA as EPA's Designated Senior Official for IRM (the "DSO", as required by the Paperwork Reduction Act and OMB Circular A-130), and we are working to clarify related redelegations of responsibility and authority. We have strengthened the IRM Steering Committee by ensuring direct DSO leadership, raising the level of seniority of Committee members, and engaging the Committee directly in key decisions on IRM planning, contracting, policies, and major systems activities. The Committee's new charter is presently in the approval process.

As one of its first tasks in fiscal 1994, the Committee is presently focusing the Assistant Administrators' and Regional Administrators' attention on creating a strategic IRM vision. The Committee is obtaining the views of the Agency's key external stakeholders by soliciting input on IRM strategies from the National Advisory Council on Environmental Policy and Technology (NACEPT).

3. **Strengthening IRM Components in the Programs** - IRM is patterned after the organizational culture in EPA - decentralized implementation and operation. We are actively working with the SIRMOs in the Programs to strengthen that position, and the support available to organizations performing or utilizing IRM in the Programs. This work is primarily in the form of a Model IRM Program study. After completing the study in March 1994, we will take steps to formally delegate appropriate functions to the programs/regions, and to create proposed organizational structures, position descriptions, etc., for the SIRMO organizations.

We are also working to strengthen IRM components in certain programs by increasing their awareness and knowledge of IRM issues. This effort will focus on periodic internal communications, technical assistance, and formal training. For example, we recently provided IRM training, which was very well received, to 42 Contract Officers and Specialists within the Headquarters Office of Acquisition Management and the Contracts Management Division in Cincinnati.

4. Supporting Data Integration - We are involved in this area in at least five ways. First, we have dedicated resources to "set the rules" by which data are defined and managed. We established the Information Management/Data Administration program in 1992 towards this end. This includes EPA data policies which provide the links to integrate data, like the Facility ID and the Locational Data Policy. Setting and enforcing these rules is critical to success in this area. Second, we are working to improve the utility of mechanisms that are in place to support integration, like the OIRM-operated FINDS. An improved version 2.0 of FINDs was released in late 1993, and we plan to implement version 3.0 during FY94. Third, we have proposed a major initiative to build an integrated environmental database for EPA called "ENVIROFACTS," and to provide initial capabilities focused on selected geographic initiatives. This "data warehouse" is envisioned as an interim approach to enable better integration and public access, until key program systems undergo modernization and reengineering.

Fourth, we are working on this same effort to develop access tools (GATEWAY) to support analysis using ENVIROFACTS data. Fifth, we are working in concert with other Federal agencies to ensure GATEWAY, ENVIROFACTS, and other information locators are consistent with national and international efforts towards environmental data integration. We are also actively engaged in positioning EPA for successful contributions to the information superhighway, via Internet.

5. Fixing Specific Deficiencies - We are aggressively addressing the many specific recommendations made by OIG in various IRM-related audits. Overall, we believe that implementing the recommendations will result in a stronger IRM program. When, on occasion, we disagree with the specifics of how to implement a particular recommendation, our strategy is to implement solutions that are responsive to the recommendation's intent.

We have in place specific action plans responding to recommendations from the following audits:

- EPA's Management of Computer Sciences Corporations Contract Activities - Of the 98 recommendations in this audit, 32 were related and assigned to OIRM for action.

  All actions assigned to OIRM were completed by the end of September 1993.

- EPA Needs to Strengthen the Acquisition Process for ADP Support Services Contracts - This audit recommended that 14 specific actions be taken. All actions were completed by the end of September 1993.

- EPA Needs to Strengthen General Controls Over System Software - This audit recommended that 20 specific actions be taken. All actions were completed by September 30, 1993.

- EPA Must Fully Address Longstanding Information Resources Management Problems - This audit recommended that 28 specific actions be taken. All actions will be completed by the end of October 1995.

Addressing the IRM concerns raised in the recent past is considered a very serious matter by our senior leadership team. We are engaged in addressing these concerns on a daily basis, and intend to make permanent changes to improve those areas of weakness, while retaining the solid capabilities in IRM that have served the Agency well over the years.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AA	Assistant Administrator
ADP	Automated Data Processing
AIRS	Aerometric Information Retrieval System
BBS	Bulletin Board System
CASE	Computer Aided Software Engineering
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFO	Chief Financial Officer
CIO	Chief Information Officer
CO	Contract Officer
DAA	Deputy Assistant Administrator
DI	Data Integration
DOPO	Delivery Order Project Officer
DSO	Designated Senior Official
EDI	Electronic Data Interchange
EPA	Environmental Protection Agency
FINDS	Facility Index System
FTE	Full Time Equivalency
GAO	General Accounting Office
GIS	Geographic Information Systems
GPRA	Government Performance and Results Act of 1993
ICMS	Integrated Contract Management System
IDEA	Integrated Data for Enforcement Analysis
IFMS	Integrated Financial Management System

IMDA	Information Management/Data Administration
IRM	Information Resources Management
IRMD	Information Resources Management Division-Cincinnati
IRMPG	IRM Planning Group
LAN	Local Area Network
NDPD	National Data Processing Division
NPR	National Performance Review
OAM	Office of Acquisition Management
OARM	Office of Administration and Resources Management
OE	Office of Enforcement
OIG	Office of Inspector General
OIRM	Office of Information Resources Management
OMB	Office of Management and Budget
OPPE	Office of Policy, Planning and Evaluation
OPPTS	Office of Prevention, Pesticides, and Toxic Substances
ORME	Office of Regulatory Management and Evaluation
OSWER	Office of Solid Waste and Emergency Response
PCS	Permit Compliance System
PCSC	Personal Computer Site Coordinator
PO	Project Officer
PWSS	Public Water Service Supply
RAD	Rapid Application Design
RCRIS	Resource Conservation and Recovery Information System
RI/FS	Remedial Investigation/Feasibility Study
RTP	Research Triangle Park

SDLC	System Development Life Cycle
SEDM	State/EPA Data Management program
SIRMO	Senior Information Resource Management Official
STARS	Strategic Targeted Activities for Results System
TQM	Total Quality Management
TRIS	Toxic Release Inventory System

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