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HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM ANNUAL PROGRESS REPORT

FY 1990

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HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
Oak Ridge, Tennessee 37831
managed by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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FOREWORD

The Hazardous Waste Remedial Actions Program (HAZWRAP) is pleased to present its Annual Progress Report for FY 1990. The report details work performed for the Department of Energy's (DOE's) Oak Ridge Operations Office (ORO), including that done on ORO's behalf for DOE Headquarters, other field offices, and other federal agencies. For simplicity, the various sections of the report refer to other federal agencies (e.g., the Air Force or the Navy) as sponsors of HAZWRAP projects. Strictly speaking, those projects have been assigned to HAZWRAP by ORO under interagency agreements between ORO and the other federal agency.

The report is organized according to the HAZWRAP Division organization, beginning with an introduction and following with information on the six program areas, and the Administrative Operations and the Technical Operations and Quality Management Departments. Additional sections of the report discuss HAZWRAP's Technical Review Group, HAZWRAP personnel, HAZWRAP publications, workshops and symposia organized by HAZWRAP staff, and Performance Improvement Process projects.

ACRONYMS AND ABBREVIATIONS

AA/EEO	affirmative action/equal employment opportunity
ADS	Activity Data Sheet
AFB	Air Force Base
AFESC	Air Force Engineering and Services Center
AFLC	Air Force Logistics Command
AFRCE-BMS	Air Force Regional Civil Engineer-Ballistic Missile Support
AFSC	Air Force Systems Command
AIRHAS	Airborne Hazardous Substances
AMC	Army Materiel Command
ANG	Air National Guard
ANL-E	Argonne National Laboratory-East
ASG	Automated Sciences Group, Inc.
ASI	Advanced Sciences, Inc.
AT	Applied Technology
ATC	Air Training Command
B&A	Budget and Accounting
B/O	Budget Obligation
CAA	Clean Air Act
CDR	conceptual design report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPR	cardiopulmonary resuscitation
CTSC	Cost Tracking and Schedule Control
DEC	Digital Equipment Corporation
DOD	Department of Defense
DOE	Department of Energy
DT&E	demonstration, testing, and evaluation
DU	depleted uranium
EIS	Environmental Impact Statement
EM	Office of Environmental Restoration and Waste Management
Energy Systems	Martin Marietta Energy Systems, Inc.
EPA	Environmental Protection Agency
ER	Environmental Restoration
ERRA	Environmental Restoration Remedial Actions
ERIS	Environmental Restoration Information System
FDA	Food and Drug Administration
FRG	Financial Review Group
FTE	Full-Time Equivalent
H-HAZMIN	Hawaii Hazardous Waste Minimization Program
HAZWRAP	Hazardous Waste Remedial Actions Program
HBCU/MEI	Historically Black Colleges and Universities/Minority Educational Institution
HQ	Headquarters
IAG	interagency agreement

IMPAC	Integrated Management Planning and Control
LAN	local area network
LANL	Los Alamos National Laboratory
LDR	Land Disposal Restrictions
LEEWAN	Lee Wan & Associates, Inc.
MAC	Military Airlift Command
NASA	National Aeronautics and Space Administration
NASP	National Aerospace Plane
NAVCO	Navy Coordinator
NAVFAC	Naval Facilities
NAVSEA	Naval Sea Systems Command
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NEESA	Naval Energy and Environmental Support Activity
ORAU	Oak Ridge Associated Universities
ORO	Oak Ridge Operations Office
ORRI	Oak Ridge Research Institute
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PBP	project budget plan
PB&C	Planning, Budget, and Control
PC	personal computer
PCS	Program Control System
PEER	PEER Consultants, P.C.
PEIS	Programmatic Environmental Impact Statement
PIMS	Personnel Information Management System
PIP	Performance Improvement Process
PMRMA	Program Manager, Rocky Mountain Arsenal
PMS	Project Management System
PRDA	Program Research and Development Announcement
QA	quality assurance
QC	quality control
RAP	Remedial Actions Planning
RCRA	Resource Conservation and Recovery Act
R&D	research and development
RD&D	research, development, and demonstration
RDDT&E	research, development, demonstration, testing, and evaluation
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	remedial investigation
RMA	Rocky Mountain Arsenal
SAC	Strategic Air Command
SCITEK	Science and Technology, Inc.
SDB	small, disadvantaged business
SI	Site Inspection

ACRONYMS AND ABBREVIATIONS (Continued)

SPACECOM	Space Command
SPARC	Students Promoting Awareness of Races and Cultures
SRS	Savannah River Site
TAC	Tactical Air Command
TQM	Total Quality Management
TRG	Technical Review Group
T/S/D	Treatment, Storage, and (or) Disposal
UST	underground storage tank
WFO	Work for Other Federal Agencies
WIN	Waste Information Network
WMIS	Waste Management Information System

EXECUTIVE SUMMARY

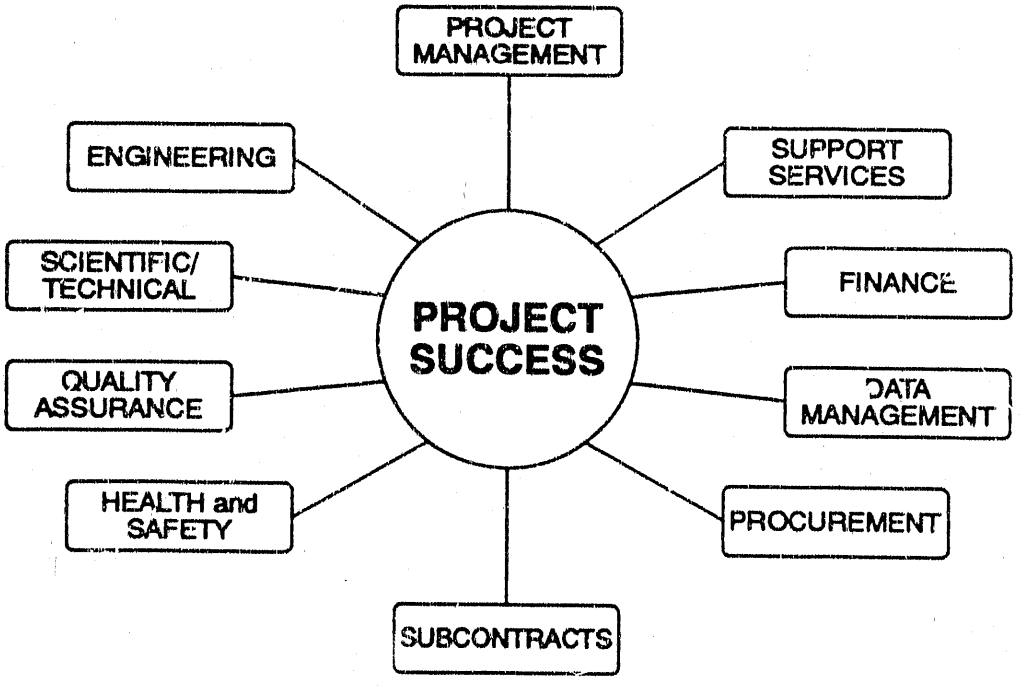
The Hazardous Waste Remedial Actions Program (HAZWRAP) is a division of the Applied Technology Organization of Martin Marietta Energy Systems, Inc. (Energy Systems), the Management and Operating contractor for the Department of Energy (DOE) Oak Ridge Operations Office (ORO). HAZWRAP's mission is to develop, promote, and apply cost-effective hazardous waste management and environmental technologies to help solve national problems and concerns. It applies the unique combination of research and development capabilities, technologies, management expertise, and facilities in the Energy Systems complex to address problems of national concern.

HAZWRAP is organized into six programs that manage the technical projects assigned by ORO. The programs are supported by the Administrative Operations Department and the Technical Operations and Quality Management Department. The programs report to the Deputy Director who, with the Department Heads, reports to the Director. Although they differ in detail, HAZWRAP programs follow a common approach to adding value to projects managed (see figure). Integrating the functions of procurement, data management, finance, health and safety, quality assurance, scientific/technical and engineering expertise, support services, and subcontractors into a single team, HAZWRAP's Project Managers ensure project success. By sharing these resources across many projects, costs to specific projects are minimized. HAZWRAP's added value then comes from better execution of projects, delivery of better products, and containment of costs.

The Airborne Hazardous Substances (AIRHAS) Program assesses and mitigates human health and environmental risks from airborne hazardous materials, including radon, asbestos, indoor air pollution, stationary sources, and other airborne hazards. AIRHAS brings expertise in physics, engineering, biomedicine, and industrial hygiene, as well as project management, to bear on projects that are distributed across the United States, Europe, and the Far East.

The Pollution Prevention Program manages projects that focus on waste minimization, hazardous materials management, regulatory compliance auditing, facility closure, and hazardous materials management. The thrust of the program, as the name implies, is to change the way pollutants are managed. This involves emphasis on avoiding creation of pollutants rather than on treating and disposing of pollutants after they are created. Projects involve, among other things, evaluating industrial processes for possible modification to be less polluting. The range of expertise the Pollution Prevention Program offers includes guidance development, policy option development, minimization studies, health and safety, process design, used oils and solvents recycling studies, environmental impacts, and hazardous materials management. Successful projects have been conducted at federal facilities across the United States, including Hawaii.

The Remedial Actions Planning (RAP) Program was established by DOE to assist other federal agencies in planning cleanups at federal facilities and thereby create a resource which DOE could apply to its own facilities. RAP now provides full-service environmental management support to more than 225 projects at more than 150 federal facilities throughout the United States. The majority of these projects are for cleanup of hazardous waste sites under the Comprehensive Environmental Response, Compensation, and Liability Act. RAP projects are done primarily for site characterization, selection of remedial action, and remedial action design. RAP does not undertake implementation of routine remedial actions because that is properly a private sector function and also because remedial design and implementation by a single entity carries an inherent conflict of interest (i.e., the opportunity to over design in order to maximize income during the implementation phase).



The HAZWRAP approach to project execution draws on expert resources to ensure project success.

The RAP Program employs 42 project managers and support personnel with backgrounds in engineering and the sciences in addition to extensive project management experience. Another 40 staff support RAP projects directly in the areas of quality assurance/quality control, hydrogeology, engineering, and risk management. Up to 1500 general order contractor employees carry out the projects managed by RAP.

The Environmental Restoration (ER) Program is involved primarily in ORO's support to the DOE Headquarters Office of Environmental Restoration (EM-40). The ER Program has served as a facilitator in bringing together the resources and expertise available within the DOE Field Office and contractor organizations nationwide and has provided both management and technical support to EM-40. Both management and technical support has been provided to planning exercises and workshops, including each of the Five-Year Plans. Management support has included preparation of draft procedures and guidance, preparation of draft management documents, and review and integration of field office project management and summary reports. Technical support has included regulatory document reviews, regulatory analyses, risk assessments, cost estimating, and prioritization system design and review.

The Technology Programs area supports both DOE's Office of Environmental Restoration and Waste Management (EM) and its Work for Other Federal Agencies (WFO) Program. Technology Programs now has a major support role to ORO in the demonstration, testing, and evaluation (DT&E) activities of EM's Office of Technology Development (EM-50). Tasks include technical oversight of DT&E projects; assistance in the development of program plans; coordination of interagency agreements; technical review and analysis of proposed new technologies from industry, DOE, and other federal agencies; promotion of technology exchange; and technical support to DT&E procurement activities. Additionally, Technology Programs supports the Office of Waste Operations (EM-30) in the areas of technology reviews, evaluation of waste handling alternatives, regulatory analysis, and data reviews.

The Information and Data Systems Program provides support both internally to HAZWRAP programs and externally to ORO and its DOE and WFO sponsors. The major activity within the program is management of the DOE Waste Information Network (WIN). Resident on a VAX cluster platform of computers, WIN provides DOE a nationwide system for transfer of technical and management information and data. Features include data bases, bulletin boards, data transfer, on-line conferencing, a formal concurrence system, electronic messaging, and integrated spreadsheet with graphics. WIN supported more than 1300 users in FY 1990. Of DOE's WFO sponsors, the Air Force Logistics Command has used WIN most extensively, to date. The Information and Data Systems Program also supports the office automation needs of all of HAZWRAP.

The Administrative Operations Department provides administrative support to HAZWRAP programs. Support includes cost tracking and schedule control; finance; coordination of contracts with small, disadvantaged [8(a)] businesses; affirmative action coordination; and safety and publications support.

The Technical Operations and Quality Management Department provides specialized technical staffing to projects conducted by all of HAZWRAP's programs. Experts in quality assurance, engineering, hydrogeology, regulatory analysis, and risk management are members of project teams, assisting the project managers in execution of the work, maintaining technical excellence, and adding value to projects managed. While the key technical staff are HAZWRAP employees, they are supported and augmented by interns, subcontractors, and employees from other Energy Systems organizations. Technical Operations is also the locus for implementing HAZWRAP's Total Quality Management (TQM) program. HAZWRAP has initiated an aggressive TQM program that focuses on people involvement, a prevailing attitude of trust, and clearly communicated needs throughout the organization. Approximately 30% of the staff will be trained in team activities, statistics, team problem solving, and other TQM tools during the coming year. The TQM program activities support the Energy Systems values of concern for people, working together, and challenging goals.

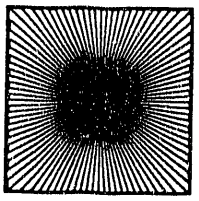
HAZWRAP employed 110 people at the end of FY 1990 with an additional 30 staff from other Energy Systems organizations providing direct support. Seventy-five of the 110 (68%) have technical backgrounds in engineering or the sciences; 55% have advanced degrees. HAZWRAP completed work valued at $88.4 million in FY 1990.

ABSTRACT

The Hazardous Waste Remedial Actions Program (HAZWRAP), a unit of Martin Marietta Energy Systems, Inc., supports the Department of Energy (DOE) Oak Ridge Operations Office in broadly environmental areas, especially those relating to waste management and environmental restoration. HAZWRAP comprises six program areas, which are supported by central administrative and technical organizations. Existing programs deal with airborne hazardous substances, pollution prevention, remedial actions planning, environmental restoration, technology development, and information and data systems. Eighty-five of HAZWRAP's 110 employees work in programs, with 10 employees in the technical support area and 8 in the administrative support area.

HAZWRAP managed a budget of approximately $210 million in FY 1990. Those funds were to support both DOE's core missions and its Work for Other Federal Agencies (WFO) Program. Within DOE's core missions, HAZWRAP's funding comes primarily from the Office of Environmental Restoration and Waste Management. Additional funding comes from the Office of the Assistant Secretary for Defense Programs. Federal agencies supported by DOE's WFO Program include the Air Force, Navy, Army, National Guard, Environmental Protection Agency, State Department, Food and Drug Administration, and the Department of Agriculture.

1. INTRODUCTION



1. INTRODUCTION

The Hazardous Waste Remedial Actions Program (HAZWRAP) is an Applied Technology (AT) unit of Martin Marietta Energy Systems, Inc. (Energy Systems), the Management and Operating contractor for the Department of Energy (DOE) Oak Ridge Operations Office (ORO). HAZWRAP supports DOE and, through DOE, other federal agencies. HAZWRAP strives to incorporate Energy Systems' values of concern for people, working together, and setting challenging goals into all of its activities. As a management organization, HAZWRAP recognizes that its primary resource is people and constantly strives to enhance that resource (Fig. 1).

1.1 MISSION

HAZWRAP's mission is to develop, promote, and apply cost-effective hazardous waste management and environmental technologies to help solve national problems and concerns. HAZWRAP seeks to serve as integrator for hazardous waste and materials management across the federal government. It applies the unique combination of research and development (R&D) capabilities, technologies, management expertise, and facilities in the Energy Systems complex to address problems of national importance.

1.2 VISION

HAZWRAP's vision is to be the best at what it does, contribute to solutions of national and international environmental problems, and provide its employees with challenging work in a secure environment with opportunities for growth and creativity. HAZWRAP is customer driven. It strives to meet the unique needs of a broad spectrum of sponsors. ORO is its prime customer. ORO, in turn, directs HAZWRAP to support other customers both within Energy Systems and among other external agencies. Since its creation in 1984, HAZWRAP has developed and refined an approach to managing environmental projects that is being emulated by organizations facing similar environmental challenges throughout the government. This management approach is founded on a culture that promotes listening to the needs of sponsor organizations, independently analyzing problems and alternative solutions, empowering staff at all levels to find better ways to do their jobs, recognizing and rewarding excellence, and understanding that all jobs require teamwork. HAZWRAP pays close attention to lessons learned so that it can continue to improve job performance.

HAZWRAP is committed to applying Energy Systems' values of **concern for people, working together**, and **challenging goals** to all its efforts. As a management organization, its only resource is people. HAZWRAP consistently strives to find the best people for its staff. Through training and mentoring, new employees are both prepared for the technical performance of their tasks and imbued with the HAZWRAP culture.

HAZWRAP is committed to finding solutions to national and international environmental problems. Work currently focuses on problems involving hazardous wastes and hazardous materials faced by federal agencies in the United States, Europe, and the Far East. HAZWRAP will continue to seek opportunities to serve DOE, including DOE's Work for Other Federal Agencies (WFO) Program, wherever HAZWRAP's special expertise can contribute to the solution of environmental problems.

1.3 GOALS

HAZWRAP's goals include the following:

- To serve DOE and other federal agencies by developing proactive solutions to environmental problems.
- To serve DOE and other federal agencies as key contact and integrator for environmental issues to reduce duplication of effort and to save taxpayers' money.
- To be the premier environmental organization in the federal government system for scientific, engineering, risk analysis, regulatory, educational, strategic planning, and technology transfer support.
- To seek, train, develop, and promote the best talent possible through aggressive programs for professional and trade organization involvement, college and university programs, equal employment opportunity, affirmative action, and human resource development.

1.4 STRATEGY

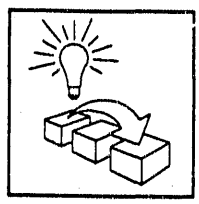
HAZWRAP's strategic objectives include the following:

- To develop a full range of activities, including applied research, strategic planning, applications, management, and training.
- To become the federal agency focus for environmental risk management, pollution prevention, and environmental compliance.
- To transfer technology to federal agencies, academia, and the private sector.

HAZWRAP established itself early as a leader in hazardous waste environmental issues within the federal government. That early leadership made entry into the areas of airborne hazardous substances and pollution prevention possible. HAZWRAP's strategy involves continued expansion of capabilities, focusing in the near term on risk management capabilities, regulatory analysis, and waste management operations for hazardous, radioactive, and mixed wastes and on greater involvement of educational institutions in research, undergraduate and graduate education, continuing education programs, and technology transfer. Establishment of remote (outside of Oak Ridge) project offices will permit greater responsiveness. Continued involvement in DOE's research, development, demonstration, testing, and evaluation (RDDT&E) activities; the Environmental Protection Agency's (EPA) Superfund Innovative Technology Evaluation (SITE) Program; and the DOE-Department of Defense (DOD)-EPA Technology Demonstration Program and use of remedial action subcontractors will enhance HAZWRAP's role in technology transfer.

Fig. 1. HAZWRAP staff.

2. DEVELOPMENT AND PLANNING STUDIES



2. DEVELOPMENTAL AND PLANNING STUDIES

2.1 SCOPE OF ACTIVITIES

Developmental and Planning Studies comprises strategic issues that affect the well-being and growth of the Division. Included are development of new business, coordination of strategic planning within HAZWRAP, support to sponsors in strategic planning, interface with policy and planning organizations, coordination of the Technical Review Group (TRG) (Sect. 5), and assistance to Division managers in determining ways to improve HAZWRAP operations.

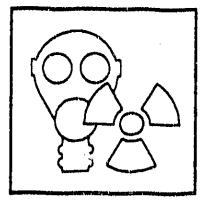
2.2 SIGNIFICANT ACCOMPLISHMENTS DURING FY 1990

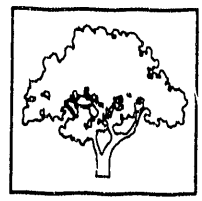
The major activity during FY 1990 was support to the DOE Environmental Restoration and Waste Management Five-Year Plan FY 1992-1996 effort. Full-time support was provided to the Editorial and Policy Coordination task and to the Environmental Restoration task. Twelve HAZWRAP staff provided ad hoc support to the Environmental Restoration, Technology Development, Waste Operations, and Corrective Activities task by reviewing Activity Data Sheets (ADSs) and text. HAZWRAP editors edited the various drafts of the document.

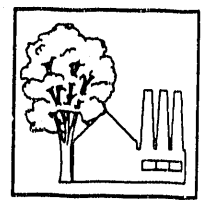
2.3 EXPECTED NEAR-TERM ACTIVITIES

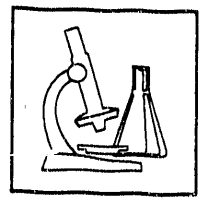
HAZWRAP is developing an educational initiative that will consolidate and extend the various educational activities now being done. The initiative establishes line responsibilities for **College and University Programs, Outreach, Internal Training, and Sponsored Training.** The **College and University Programs** include all student activities such as internships, summer jobs/program participation, graduate study programs, cooperative programs, and faculty opportunities such as sabbatical leaves and research participation. It also includes special focus activities such as HAZWRAP's Historically Black Colleges and Universities/Minority Educational Institution (HBCU/MEI) Program. **Outreach** includes programs for elementary and secondary teachers, high school students, civic groups, and the popular press. **Internal Training** identifies training needs for HAZWRAP employees, arranges for the training to be done, documents completed training, and alerts staff and management to needs for retraining or changes in training requirements. **Sponsored Training** assists the various program areas in carrying out training requested by sponsors or done on behalf of sponsors.

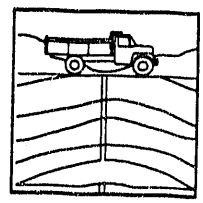
3. PROGRAM AREAS

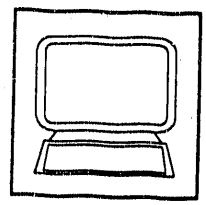












3.1 AIRBORNE HAZARDOUS SUBSTANCES PROGRAM

3.1.1 Scope of Activities

The Airborne Hazardous Substances (AIRHAS) Program within HAZWRAP assesses the potential hazards to personnel and the environment attributed to airborne hazardous substances. Project managers within the Program develop and apply engineering and management techniques to minimize these potential hazards. The Program began in 1987 with projects addressing asbestos management issues throughout the Air Force and radon management issues throughout the Navy. The Program scope expanded rapidly to include air pollution, industrial hygiene, and indoor air quality concerns for a broad base of federal agencies.

3.1.2 Sponsors/Clients

The AIRHAS Program conducts projects on behalf of ORO for the following federal agencies. For simplicity, these discussions describe that work as if HAZWRAP were performing it directly for the agency involved.

The Program has grown to include projects for all three arms of DOD, as well as the EPA, State Department, Food and Drug Administration (FDA), and National Guard Bureau. Projects range from worldwide efforts to studies focused on a single point source, for example, an incinerator on a Naval installation. Four program efforts involve foreign/overseas work: the Navy Radon Project, Air Force Asbestos and Radon Projects, the State Department Asbestos Project, and the Marshall Islands (Army) Environmental Support Project.

3.1.3 Funding Profile

The following table presents the cumulative project funding in the AIRHAS Program through the end of FY 1990. The Air Force and Navy remained the largest sponsors.

Sponsor	Funding through FY 1990
Air Force	8,500,000
Navy	9,900,000
Army	3,300,000
National Guard	300,000
Others	400,000
Total	22,400,000

3.1.4 Personnel

"Experience" is a key attribute of the AIRHAS project managers. The average experience of the eight managers is approximately 15 years. The managers have expertise in disciplines such as physics, engineering, biomedicine, and industrial hygiene, all of which are well suited for the nature of program work.

3.1.5 Significant Accomplishments During FY 1990

A combination of project starts, completions, and interim accomplishments highlighted FY 1990. New project initiatives included the Air Force-wide radon project, air pollution studies of three Naval incinerators, and an evaluation of volatile organic compound emissions over an entire Air Force base. The completion of prototype Asbestos Management and Operating Plans for the Air Force-wide asbestos management project and the deployment of radon detectors for the screening phase of the Navy-wide radon assessment project represented interim milestones achieved this year. Numerous asbestos survey projects for the Navy represent projects that were completed.

Many of the projects in the AIRHAS Program use a combination of specialized

expertise within Energy Systems, aided by private sector involvement, to create the best solutions to airborne hazards in federal agencies. The Eglin Air Force Base (AFB) Ventilation System Project is a good example.

The Air Force Engineering and Services Center (AFESC) needed the capability of machining depleted uranium (DU) using existing machine tools in the Advanced Warhead Experimentation Facility at Eglin AFB, Florida. The existing exhaust system in the machine shop was inadequate in that it was never designed to address the radioactive, toxic, and pyrophoric properties of DU and, therefore, needed to be modified. The Air Force, unable to find the required expertise in private industry, approached DOE and Energy Systems after learning that this kind of problem has been addressed for many years in the Oak Ridge Y-12 Plant shops. The Air Force, through a DOE interagency agreement (IAG), worked with an AIRHAS/Energy Systems engineering team to apply the proven, in-place technology to give the Air Force its new capability.

The original scope of the effort addressed three issues at Eglin AFB. The first was to design for each machine tool a negative-pressure containment hood that both allowed the operator full access to the work piece and accommodated the full range of travel of the machine tool. Second, the exhaust from each containment hood had to be filtered to capture any entrained uranium particles before the exhaust could be released to the atmosphere. And finally, the control system for the facility exhaust system had to be modified to prevent machine tool operation without adequate exhaust. While addressing these issues during the development of the specification for the new exhaust system, the AIRHAS/Energy Systems Engineering team alerted the Air Force that one of its machine tools had inherent design features that precluded its use for DU. Even the installation of a perfect exhaust system on it would not prevent hazards to both personnel and the environment. On this basis, the team specified, and the Air Force procured, a new machine tool that can be modified for safe operation with DU.

The AIRHAS/Energy Systems Engineering team developed the conceptual design and the detailed performance specifications for the new exhaust system. Precision Machining, Pensacola, Florida, was awarded the contract to fabricate and install the system modifications. Energy Systems Engineering personnel closely monitored the on-site fabrication and installation of the system modifications and performed the final checkout and system balancing, just as if the system had been installed at the Y-12 Plant. The fully functional, DU-qualified exhaust system that met all performance specifications will be turned over to the Air Force before December 31, 1990. This project is a notable example of the cost-effective transfer of unique technology, developed by DOE at Oak Ridge, to other agencies of the government.

A special project within the AIRHAS Program is the project on the Kwajalein Atoll of the Marshall Islands. This project was begun late in FY 1990. The project is intended to provide overall environmental management support to the Army in the areas of environmental restoration, air and water quality, hazardous materials and waste management, and regulatory compliance. Because of the variety of efforts, the other programs within HAZWRAP have been, and will continue to be, called upon to support and manage specific efforts, thereby dedicating the appropriate expertise to help ensure success. A project office was set up on the Atoll to interface with project support/management stateside to minimize the logistical problems that arise from working "on the other side of the world" on a little atoll. The location of Kwajalein Atoll and relative distances to surrounding areas are shown in Figs. 2 and 3.

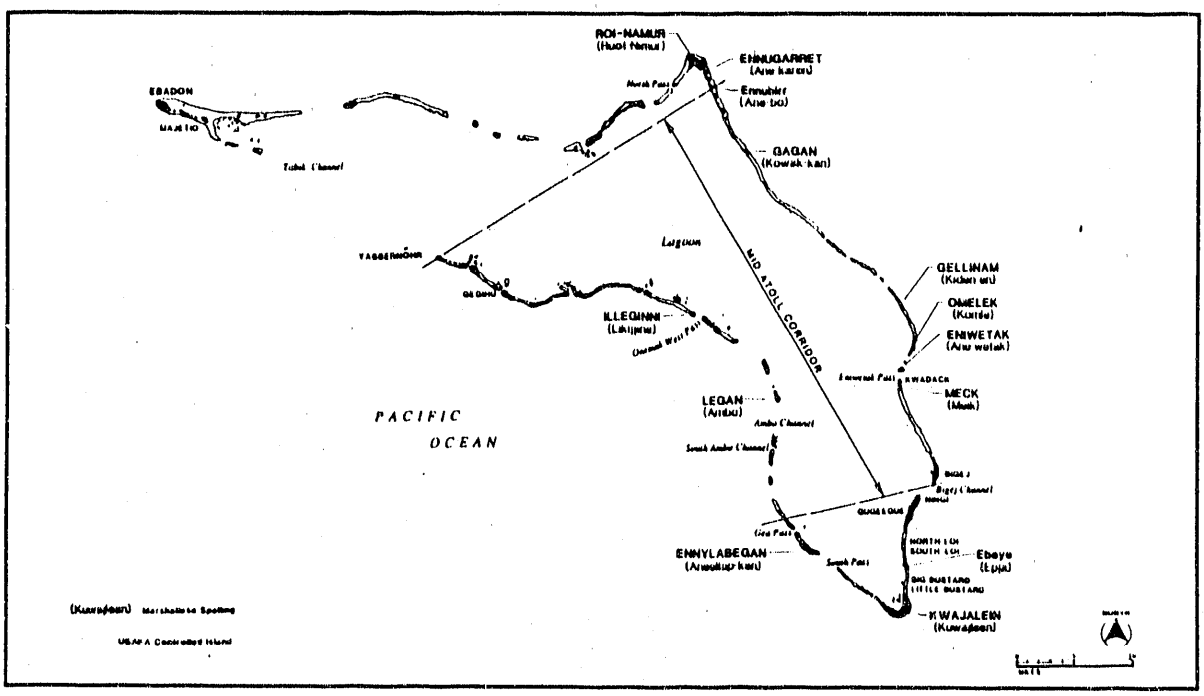


Fig. 2. U.S. Army Kwajalein Atoll.

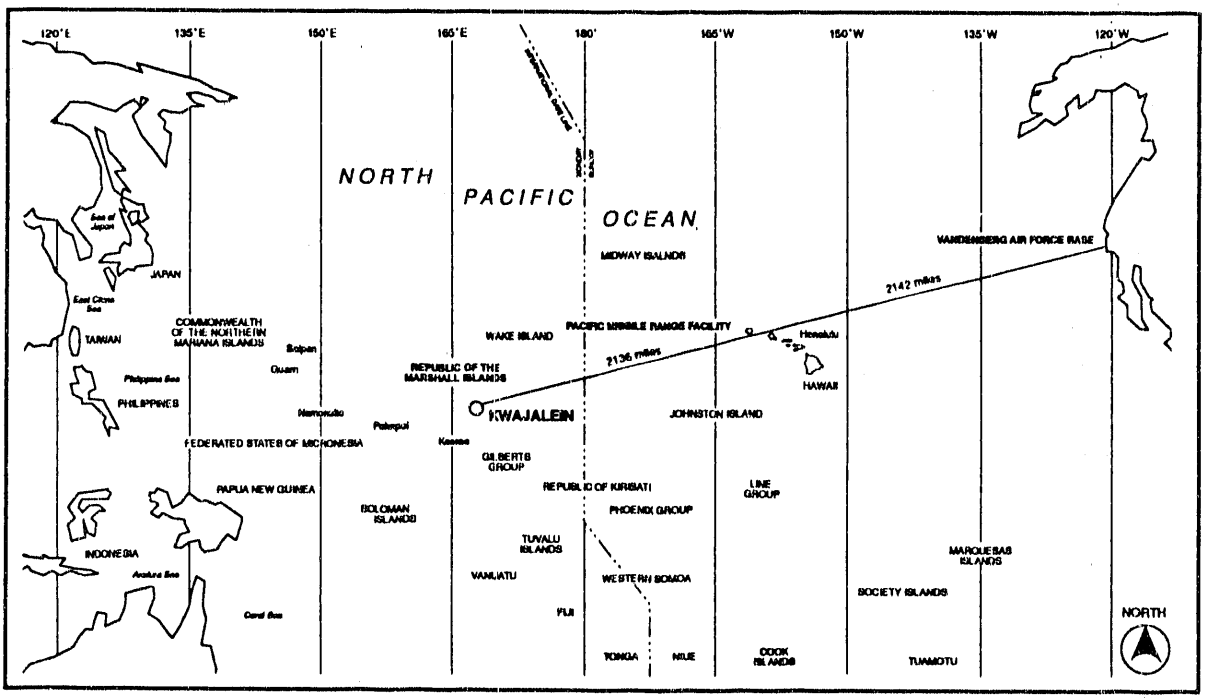


Fig. 3. Location of U.S. Army Kwajalein Atoll.

3.1.6 Expected Near-Term Activities

As the revisions to the Clean Air Act (CAA) are adopted by the Congress, federal facilities will be required to assess the areas in which compliance will be a challenge and to develop better management techniques to remain in compliance. Assessing the areas where existing practices are inadequate to meet the new regulations will present the major opportunities for the AIRHAS Program.

3.1.7 Long-Term Expectations

Even though asbestos and radon activities dominate the AIRHAS Program at the present time, these activities are expected to diminish in the future as the technologies in these areas mature. Increased emphasis on indoor air quality and outdoor air pollution will provide the major area for long-term growth. The CAA revisions will have both an immediate as well as a long-term effect on the Program. More stringent regulations on indoor air quality, especially with regard to Occupational Safety and Health Administration (OSHA) regulations, will significantly shape the future of the AIRHAS Program.

3.2 POLLUTION PREVENTION PROGRAM

3.2.1 Scope of Activities

The Waste Minimization Program, which came into existence during 1987, was developed to assist federal agencies with the management of projects that focus on waste minimization, hazardous materials management, regulatory compliance auditing, facility closure, and hazardous materials training.

This country is currently in the midst of a fundamental transition in the philosophy and practice of hazardous materials management, which, in the past, consisted almost entirely of controlling the by-products of hazardous materials use (pollution control). A deliberate effort is under way to shift waste management focus away from the "end of the pipe." Steps are now being taken to prevent the creation of these by-products (pollution prevention). To meet these challenges the Waste Minimization Program changed its title and service philosophy during FY 1990 to "Pollution Prevention."

This new name indicates that the Program's scope is broader than just waste; that is, it includes all hazardous materials use from design and procurement to waste disposal. The title Pollution Prevention better depicts what current efforts in support of DOE, DOD, and other federal agencies strive to accomplish.

3.2.2 Sponsors/Clients

The Pollution Prevention Program conducts projects on behalf of ORO for DOE, DOD (Air Force, Army, Navy, Marine Corps), and the FDA. For simplicity, these discussions describe that work as if HAZWRAP were performing it directly for the agency involved.

Pollution Prevention Program planning and implementation support was provided to DOE. Work was conducted for the Naval Energy and Environmental Support Activity (NEESA) and the Naval Facilities Engineering Command (NAVFAC), and the Navy Sea Systems Command (NAVSEA); the Air Force [Strategic Air Command (SAC), Air Training Command (ATC), Tactical Air Command (TAC), Air Force Logistics Command (AFLC), Air Force Systems Command (AFSC), Military Airlift Command (MAC), the Air Force Regional Civil Engineer-Ballistic Missile Support Office (AFRCE-BMS), Space Command (SPACECOM), AFESC, and Air Force/LEEV]; the Army [Army Materiel Command (AMC) and the Army Toxic and Hazardous Materials Agency]; and the Marine Corps through Headquarters (HQ) NAVFAC. The services provided to FDA included conducting environmental compliance assessments at FDA laboratories around the United States.

3.2.3 Funding Profile

Of the 61 ongoing projects within Pollution Prevention, approximately 93% was funded by DOD, while the remaining 7% was funded by DOE. The primary funding sources/amounts for DOD efforts follow:

Sponsor	Funding
AFLC	$ 751,697
AFRCE-BMS	280,000
AFSC	825,000
SPACECOM	862,104
ATC	630,334
Air Force/LEEV	282,714
MAC	410,000
SAC	1,429,000
TAC	312,511
AFESC	1,085,000
NAVFAC	4,215,830
NEESA	1,010,000
NAVSEA	25,000
AMC	586,189
Total	$12,705,379

The DOE funding, which supports efforts for the DOE HQ Office of Environmental Restoration and Waste Management (EM) and the Office of Defense Programs, amounted to $850,000 during FY 1990.

3.2.4 Personnel

The Pollution Prevention Program, which includes the program manager, six project managers, and a secretary, is divided into three groups according to technical expertise. The planning group specializes in guidance development, policy option development, technology transfer, interagency cooperation, and success demonstration. The implementation group has expertise in minimization studies, health and safety, quality assurance (QA) planning, process design, and compliance audits. The areas of specialty for the hazardous materials management group include used oil and solvent studies, base closure, environmental impact statements (EISs), hazardous materials management, and training programs.

3.2.5 Significant Accomplishments During FY 1990

Support by the Pollution Prevention Program to DOE HQ began in 1988. Those early efforts consisted of support to the Headquarters Waste Reduction Steering Committee. During FY 1990, this effort was significantly expanded to include technical support in the areas of the conceptual development of program administration, the development of guidance on pollution prevention planning, site plan reviews, the development of guidance on the conduct of process waste assessments, the development of guidance on overall program performance, development of internal memorandums of understanding, outreach to other federal agencies (especially EPA), and identification of resource needs.

A large, integrated (DOD-wide) waste minimization study of installations in Hawaii was initiated in April 1988. The DOD - Hawaii Hazardous Waste Minimization Project, known as H-HAZMIN, continued in FY 1990 under NAVFAC sponsorship. This regional, prototype study encompassed 18 DOD installations, the Pearl Harbor Navy Supply Center, and the Defense Reutilization and Marketing Office-Hawaii. The project scope, objectives, and specific installations are shown in Fig. 4. Efforts this year concentrated on identification of waste streams and recommendations as to how best to manage hazardous waste at each installation in the near term. Used Oil and Solvent Recycling Studies were completed at 14 Navy installations. These studies, done for NEESA, identified used oil and solvent waste streams and provided waste minimization alternatives to each installation.

Another noteworthy Navy Pollution Prevention project dealt with a hazardous waste materials management effort conducted for NAVFAC. This project provided procedural and software guidelines that will allow Navy shore activities to develop and operate Hazardous Materials Control and Management Programs. Other significant DOD Pollution Prevention work efforts involved such taskings as waste minimization studies and workshops for SAC, ATC, MAC, TAC, and AFLC; environmental compliance assessments for five TAC bases; environmental assessments/ impact statements for Air Force base closures and realignments, and Resource Conservation and Recovery Act (RCRA) Part B Permit Applications for Miscellaneous Units (Subpart X) at 12 SAC installations.

Two other significant Pollution Prevention Program projects conducted and/or initiated in FY 1990 were an environmental study for the new X-30 single-stage-to-orbit research vehicle known as the National Aerospace Plane (NASP) and the nine various environmental support taskings to assist the

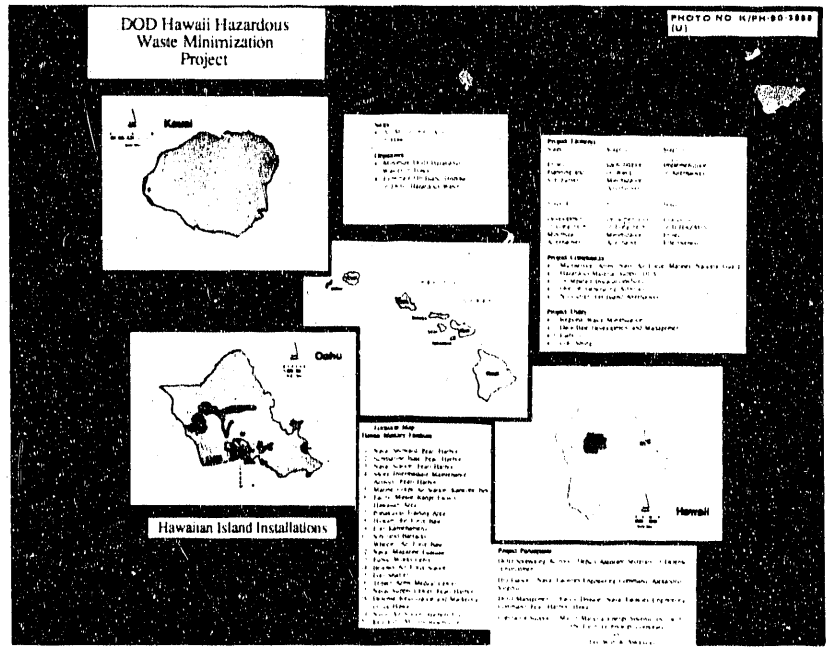


Fig. 4. Department of Defense - Hawaii Hazardous Waste Minimization Project.

Program Manager, Rocky Mountain Arsenal Office (PMRMA) in the efforts to decommission the Arsenal.

The NASP project, completed in February 1990, provided a generic program plan that set out the management and technical tasks that would be expected of an environmental contractor retained to implement the Environmental Impact Analysis Process for the NASP flight test program.

The second significant Pollution Prevention Program project, environmental support to PMRMA, was initiated in January 1990 and is projected to continue well into FY 1991, and possibly beyond. Pollution Prevention staff were tasked to develop an arsenalwide Waste Management Strategy/Plan that would examine all activities and processes being undertaken by PMRMA and its contractors in the decommissioning process. This Plan includes a detailed evaluation of each process to determine the potential for minimization of hazardous waste and recommendations for process modifications that would reduce operating costs and/or ensure regulatory compliance. Pollution Prevention staff were requested to conduct compliance audits on approximately 400 buildings at the Arsenal to identify and analyze potentially hazardous waste materials. These audits will continue into FY 1991.

PMRMA reorganized its management team toward the end of FY 1990. Pollution Prevention, through Oak Ridge Associated Universities (ORAU), began developing a program to evaluate the status of environmental compliance training at PMRMA and to establish a training program to monitor the training status for all PMRMA employees directly involved in the cleanup process. The HAZWRAP individual with overall program responsibility for the execution of all taskings requested by PMRMA resides in the Pollution Prevention Program.

The Pollution Prevention Program continued to grow in FY 1990, but the real benefits of waste minimization and pollution prevention are yet to be fully recognized by most potential sponsors. A real benefit associated with the HAZWRAP Pollution Prevention Program is the transfer of knowledge and techniques among sponsors.

Innovations developed in the work done for one sponsor are immediately transferred to others by HAZWRAP upon validation.

An analysis of generalities from completed/ongoing pollution prevention studies at DOD installations was initiated by a graduate student from The University of Tennessee who works in an internship program within the Pollution Prevention Program. In the future, this analysis will be used to inform other, similar sponsors about the primary waste streams that exist, the types of options/alternatives that can be applied to each, and the paybacks that can be realized by implementation of pollution prevention and waste minimization procedures.

3.2.6 Expected Near-Term Activities

The Pollution Prevention Program will continue to support the DOE HQ Waste Reduction Steering Committee with logistics for and participation in regularly scheduled committee meetings and with logistics and technical support for Steering Committee visits to DOE sites. The Program will continue to organize and provide technical leadership to the semiannual Waste Reduction Workshops, carry out facility plan review and analysis, develop model facility plans, and carry out a DOE-wide inventory of pollution prevention activities. The Program will continue its outreach efforts to other federal agencies (especially EPA) regarding pollution prevention and will maintain and upgrade the Pollution Prevention components of the Waste Information Network (WIN).

Current DOD and FDA projects will be completed emphasizing that each effort be accomplished within the budget and schedule and that all deliverables be of high quality to meet the sponsors' needs.

3.2.7 Long-Term Expectations

Pollution Prevention Program support to DOE HQ will continue, with emphasis on strategic planning evaluation of the efforts of various Operations Offices for consistency, maintenance of the documented basis for the Program, responses to other agencies' requests for information, development of reporting guidance, development of relevant DOE Orders, and development of QA, budget, and technology transfer guidance.

DOD efforts will continue through conducting new/ongoing pollution prevention/waste minimization studies for installations in the continental United States and Hawaii. Pollution Prevention Program capability presentations were made to representatives from U. S. Army-Europe that could possibly lead to future pollution prevention taskings in Europe. The environmental compliance work being conducted for the FDA is envisioned to increase. Additional federal agencies will be assessed to determine if this program can be of assistance in their dealing with pollution prevention matters.

Overall, the Pollution Prevention Program has grown and will continue to do so in the foreseeable future.

3.3 REMEDIAL ACTIONS PLANNING PROGRAM

The Remedial Actions Planning (RAP) Program was established in 1986 to provide support to federal agencies in their efforts to comply with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Since 1986 the RAP Program has undergone an extended period of rapid growth in terms of funding, number of projects, and staff. In late 1988, the RAP Program was divided into two units, with each unit providing similar types of support to different WFO sponsors.

3.3.1 Scope of Activities

The RAP Program currently provides full-service environmental management support to more than 225 projects at more than 150 federal installations throughout the United States. The majority of these projects are for cleanup of sites that have received hazardous wastes or hazardous materials from past practices. The regulations governing cleanup are those pursuant to CERCLA, known popularly as "Superfund." CERCLA established a series of steps for identification, characterization, remedy selection and design, and actual remediation at hazardous waste sites in the National Contingency Plan (NCP). The scope of each of the steps varies as described in Table 1. The RAP Program conducts projects in each of the steps; however, emphasis is placed on characterization, remedy selection, and design. At this time, the RAP Program does not undertake implementation of routine remedial actions. RAP Program staff are also involved in demonstration projects where innovative technologies are tested.

RCRA also regulates the cleanup of hazardous waste sites with parallel requirements to those of CERCLA. RCRA projects include RCRA Facility Investigations (RFI), RCRA Facility Assessments (RFA), design, and corrective action. These differ little in concept from the steps in CERCLA, although significant differences occur in their implementation. The RAP Program is conducting about ten RCRA projects.

Scheduling of activities is a significant part of a project manager's responsibilities.

Table 1. Phases of hazardous waste site cleanup in the National Contingency Plan

Step	Description	Typical activities
Preliminary assessment	Site discovery	Review of records, personnel interviews
Site inspection	Confirmation	Data collection limited to existing sources, preliminary risk assessment
Remedial investigation	Site characterization	Comprehensive data collection, full field program including installation of groundwater monitoring wells, health risk assessment
Feasibility study	Comparison of remedial alternatives	Engineering studies to compare cleanup technologies
Remedial design	Design of selected technology	Plans and specifications for the cleanup
Remedial action	Cleanup	Actual remediation of the site

The RAP Program also conducts, in minor proportion, a variety of other types of projects, including underground storage tank (UST) surveys, RCRA Part B Permit preparation, construction technical oversight, and wastewater system studies.

3.3.2 Sponsors/Clients

The RAP Program conducts projects on behalf of ORO for the following federal agencies. For simplicity, these discussions describe that work as if HAZWRAP were performing it directly for the agency involved.

HAZWRAP initiated IAGs between ORO and a multitude of DOD command organizations to facilitate the transfer of funds from the WFO sponsor to ORO. Table 2 lists the RAP Program sponsors. The table has been arranged to reflect the project management organization of the RAP Program by groups. The group structure permits the Program to serve individual sponsors better by dedicating staff to their projects.

The only non-DOD sponsor for which the RAP Program is currently conducting projects is the U.S. Forest Service. The IAG for the U.S. Forest Service was signed in 1990, and work is beginning on three projects.

3.3.3 Funding Profile

Table 2 summarizes cumulative funding by sponsor from FY 1985-FY 1990. In FY 1990, the RAP Program received $62,647,393 in new funding authority from WFO sponsors.

Table 2. Cumulative funding for the Remedial Actions Planning (RAP) Program by sponsor FY 1985-FY 1990

Group	Sponsor	Funding
	RAP Program Unit A	
I	Air Force Logistics Command	$ 46,158,112
II	Air Force Military Airlift Command	$ 17,766,726
III	Air Force Alaskan Air Command	$ 3,489,471
	Air Force Headquarters	$ 2,377,883
	Air Force Pacific Air Command	$ 108,196
	Air Force Reserve	$ 3,318,550
	Air Force Regional Civil Engineer	$ 227,643
	Air Force Tactical Air Command	$ 5,885,008
IV	Air Force Space Command	$ 4,398,000
	Air Force Systems Command	$ 11,462,291
V	Air Force Strategic Air Command	$ 29,366,995
	RAP Program Unit B	
VI	Air Force Air Training Command	$ 26,486,014
	Army Materiel Command	$ 408,811
	Army Toxic and Hazardous Materials Agency	$ 621,600
	U.S. Forest Service	$ 150,000
VII	Air National Guard	$ 68,129,082
VIII	Naval Facilities Engineering Command	$ 42,158,636
	Naval Energy and Environmental Support Agency	$ 5,505,957
RAP Program Cumulative Total		$268,469,178

3.3.4 Personnel

At the end of FY 1990, the two units of the RAP Program consisted of 2 program managers, 8 group leaders, 27 project managers, and 5 secretaries for a total of 42 HAZWRAP employees. Two QA Specialists are dedicated to the Program. In addition, eight subcontractor personnel provide direct support to the RAP Program project managers. Approximately 30 other Energy Systems and subcontractor personnel provide support to the RAP Program.

3.3.5 Significant Accomplishments During FY 1990

The RAP Program had many positive accomplishments during the fiscal year. The following paragraphs highlight a few of these accomplishments.

The RAP Program took on a major project at Wright-Patterson AFB, Ohio. Wright-Patterson AFB was placed on the National Priorities List by the EPA, indicating the level of concern regarding this installation. To provide an enhanced support capability for the project, HAZWRAP initiated efforts to establish an office near the Base. The local office would permit closer supervision of contractor activities and facilitate communications with the sponsor. In August 1990 office space was obtained, and a full-time project manager was transferred to staff the office. Additional personnel will be added in early FY 1991. HAZWRAP plans to open other remote offices in the coming year.

HAZWRAP is dedicated to delivering quality products to all of its sponsors. Two areas in which management oversight can have the greatest impact on environmental projects is in ensuring the quality of sample acquisition and sample analysis. In 1988, the RAP Program developed and documented quality control (QC) requirements for field methods and analytical chemistry. These documents underwent major revision in 1990. Among the improvements made were establishment of QC criteria for field screening methods and clarification of laboratory reporting requirements. In addition, the RAP Program developed standard operating procedures to ensure defensible and reproducible collection of environmental samples.

The RAP Program was asked by the AFSC to conduct a Preliminary Assessment (PA) and Site Inspection (SI) of the military space launch complex at Cape Canaveral Air Force Station, Florida (Fig. 5). The PA/SI generally requires over 1 year to complete.

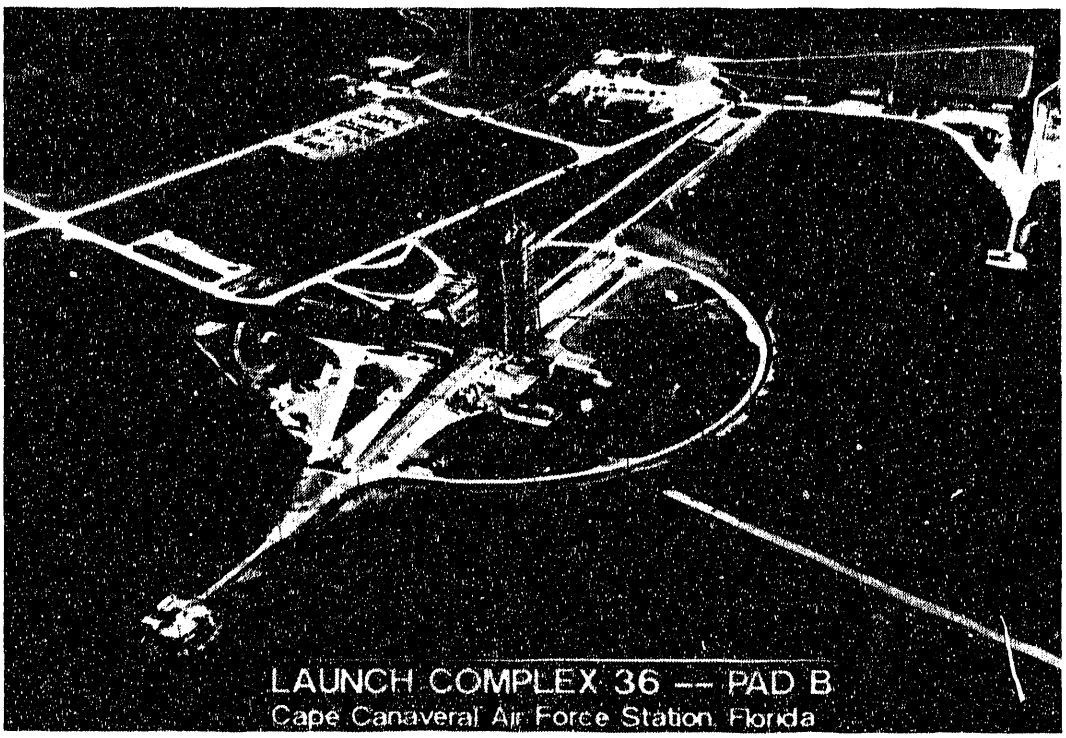


Fig. 5. Cape Canaveral Air Force Station.

For this project, however, the sponsor faced a short-term deadline imposed by regulatory agencies. The RAP Program was able to deliver the final reports within the mandated 6-month schedule. The success of the PA/SI project led to the potential for follow-up work at Cape Canaveral.

The Air National Guard (ANG) requested support from HAZWRAP to investigate hazardous waste sites at its facilities at the Massachusetts Military Reservation, which is situated on Cape Cod. This is a multiyear, multimillion dollar project encompassing activities at 72 sites on the installation. In 1990 the RAP Program completed characterization of 13 sites that pose the greatest potential threat to nearby communities. These sites are referred to as the Priority 1 sites. Studies indicate that several contaminated groundwater plumes extend beyond the Reservation boundary (Fig. 6). Where the plumes are currently affecting drinking water quality, the RAP Program recommended that residents be

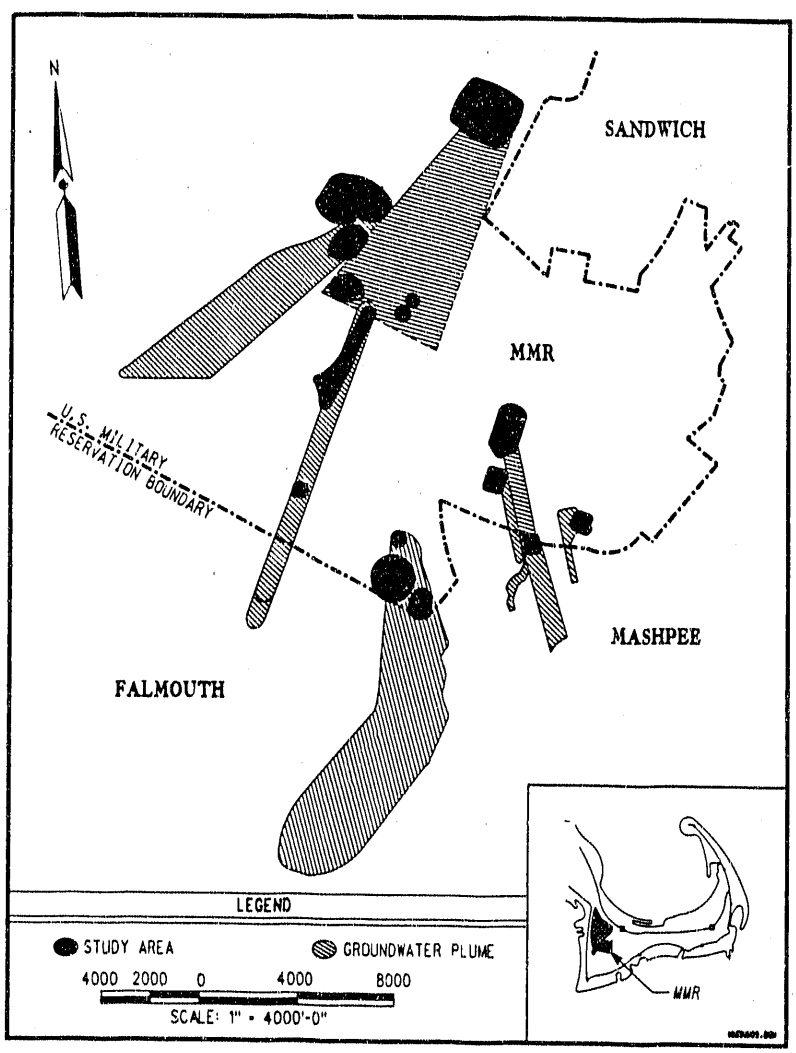


Fig. 6. Massachusetts Military Reservation.

provided bottled water, which the sponsor did. Several of the remaining plumes will affect drinking water supplies in a few years if not remediated. The RAP Program is currently analyzing treatment options and will prepare the designs for the selected remedial measures.

The RAP Program was asked to review an UST Management Program for SPACECOM. The UST program was based on Air Force requirements and was needed to bring the command into compliance with local, state, and federal regulations. The cost for implementing the program was estimated at $11 to $13 million and would take 5 years to complete. The RAP review team made a number of significant changes to the UST program that will reduce the cost by $8 million and will result in compliance 2 years earlier than the original plan.

3.3.6 Expected Near-Term Activities

In addition to continuing work on the approximately 225 ongoing projects, traditional RAP Program sponsors have indicated that new projects requests will be forthcoming in 1991. Significant among these are 2 projects from MAC, 2 from AFSC, and up to 12 projects from ANG.

The RAP Program established contact with several other federal agencies for future work. In 1990 the Forest Service initiated three small projects in the southeastern United States, and indications are that additional projects will be started in this and other regions in 1991. The U.S. Coast Guard is in the process of completing an IAG with ORO, and projects are expected to be sent to HAZWRAP in early 1991. The Coast Guard work has the potential to grow to a funding level of $5 to $10 million annually.

3.3.7 Long-Term Expectations

The RAP Program will develop new sponsors to provide a continuing funding base. Among the federal agencies targeted as potential sponsors are the National Aeronautics and Space Administration (NASA) and the U.S. Army in Europe. Both agencies have significant environmental problems and will need technical assistance to deal with them. The RAP Program made initial contact with these agencies and will endeavor to establish IAGs between them and ORO.

The RAP Program has accumulated considerable experience during its 5-year history of involvement with DOD and is interested in making this experience available to ORO and Energy Systems. In 1990 the RAP Program supported the Energy Systems Environmental Restoration (ER) Program by transferring six project managers into key positions in ER. Although the RAP Program was pleased to help in this fashion, it is also willing to provide full service to the various environmental programs at Energy Systems.

3.4 ENVIRONMENTAL RESTORATION PROGRAM

3.4.1 Scope of Activities

The HAZWRAP ER Program provided technical support to the DOE HQ Office of ER (EM-40) through ORO. This activity involved a broad range of EM-40 activities.

Even though the HQ ER Program was initiated in 1987 with a House Arms Services directive, it is still an evolving activity area. DOE is faced with the challenge of taking management principles and requirements of DOE Orders, technical processes in regulations [i.e, RCRA, CERCLA, National Environmental Policy Act (NEPA)], the Secretary of Energy's Five-Year Plan initiatives, and "the DOE way of doing business" and structuring a national ER Program. HAZWRAP played a major part in supporting this effort during FY 1990.

HAZWRAP ER activities were based on specific requests by DOE HQ to ORO and involved both management support and technical support. Management support included planning and strategy sessions facilitation, workshop organization and coordination, Five-Year Plan support, procedure and guidance package preparation, management document preparation, upper-level management document reviews, field office project management tracking and monthly summary reporting, and special subcontract management. Technical support involved field office regulatory document reviews; risk assessment support; regulatory analysis support; ER information system requirements, acceptance, and implementation support; cost estimating; and priority system design and acceptance. The ER Program continued to demonstrate that bringing the combined knowledge and expertise that exist within the DOE community and nation to bear on the EM issues in a team approach is the key to resolution.

3.4.2 Sponsors/Clients

All ER activities were conducted on behalf of ORO. DOE HQ EM-40 management personnel were the sole client of the Program; however, EM personnel from other areas, such as EM-1, from time to time requested assistance. For simplicity, the following discussion describes the work as if HAZWRAP were performing it directly for EM-40.

3.4.3 Funding Profile

The funding for FY 1990 was identified under ADS 451, which included several other work elements such as WIN and Technology Programs activities. The ER Program portion was $4.9 million in FY 1990 and is expected to grow in FY 1991.

3.4.4 Personnel

The ER Program staffing consisted of a team of line and matrixed HAZWRAP and subcontractor personnel who were organized around the type of work to be performed. While several persons joined or left the Program, the net growth of the line personnel was only one program manager. Approximately two matrixed full-time equivalent (FTE) HAZWRAP personnel supported the program from disciplines such as hydrogeology, project management, regulatory analysis, risk assessment, environmental management, technical editing, QA, and technical writing. Subcontracted personnel played a major role in supporting the Program with approximately 17 FTEs. The total

HAZWRAP ER Program staff was thus approximately 25 FTEs for the year.

3.4.5 Significant Accomplishments During FY 1990

The major accomplishments during the year were in the following areas: program planning support, priority system support, ER data base support to WIN, technical regulatory document reviews, field office project document oversight tracking/ reporting, Five-Year Plan support, stakeholder's forum support, and cost-estimating support. The most significant accomplishments are described in the following paragraphs, and a list of additional events is included.

The ER Program was active in producing the first On-Site Remediation Program Management Plan. Incorporating the directives established by the Five-Year Plan, DOE Order 4700.1, and RCRA, CERCLA, and NEPA requirements, this document had significant impact on the planning and definition of the field office On-Site Program. HAZWRAP successfully led a team of DOE field office and contractor project management experts in designing the Plan, which defines HQ's responsibilities and the method for transitioning that responsibility and accountability to the field offices. The Plan was so well received that even before upper-level HQ management plans were completed, HQ planned to submit it to the field offices as an interim final draft for their use in generation and implementation of field office and contractor management program plans. Figure 7 shows the Plan's position within the full EM organization scheme of planned management documents.

HAZWRAP personnel served on a team identified as the task force on the Planning, Budget, and Control (PB&C) Program for DOE environmental program management planning support. HAZWRAP, while attending five steering committee meetings and two Five-Year Plan guidance meetings, notably established itself in this management planning arena at HQ and was a significant contributor to the task force. In addition, significant and substantial input on reviews of draft management plans for the Director of EM as well as the Director of ER was provided.

During the year, HAZWRAP initiated a significant effort in review of field office regulatory documents. HQ has the responsibility for critical technical review of all field office regulatory documents before they are submitted to the regulatory agencies. This review ensures a quality and consistent approach throughout all DOE organizations. The majority of these large, extensively descriptive documents are characterization work plans and closure plans. Because schedules under the Federal Facilities Agreement and similar agreements are tight, reviews were almost always performed under tight time constraints. Follow-up comment resolution meetings were limited. A significant effort was required to provide the expertise to meet the challenge. For the year, 87 documents consisting of approximately 25,000 pages were reviewed, and approximately 2,000 comments were produced. The average review time was 12.8 days.

Several field offices provided positive feedback to HAZWRAP and HQ on the high quality comments produced and the significant document improvement produced from HAZWRAP's involvement.

Monitoring of field office project tracking and reporting continued to be an important activity within the Program. Nine field offices were actively funded to support 174 tasks with 198 significant milestones. Monthly management summary reports were generated from field office input and were provided to HQ for its use and distribution. An annual report, which rolls up these monthly reports, is planned.

HAZWRAP, through ORO, is responsible to DOE HQ for providing technical support

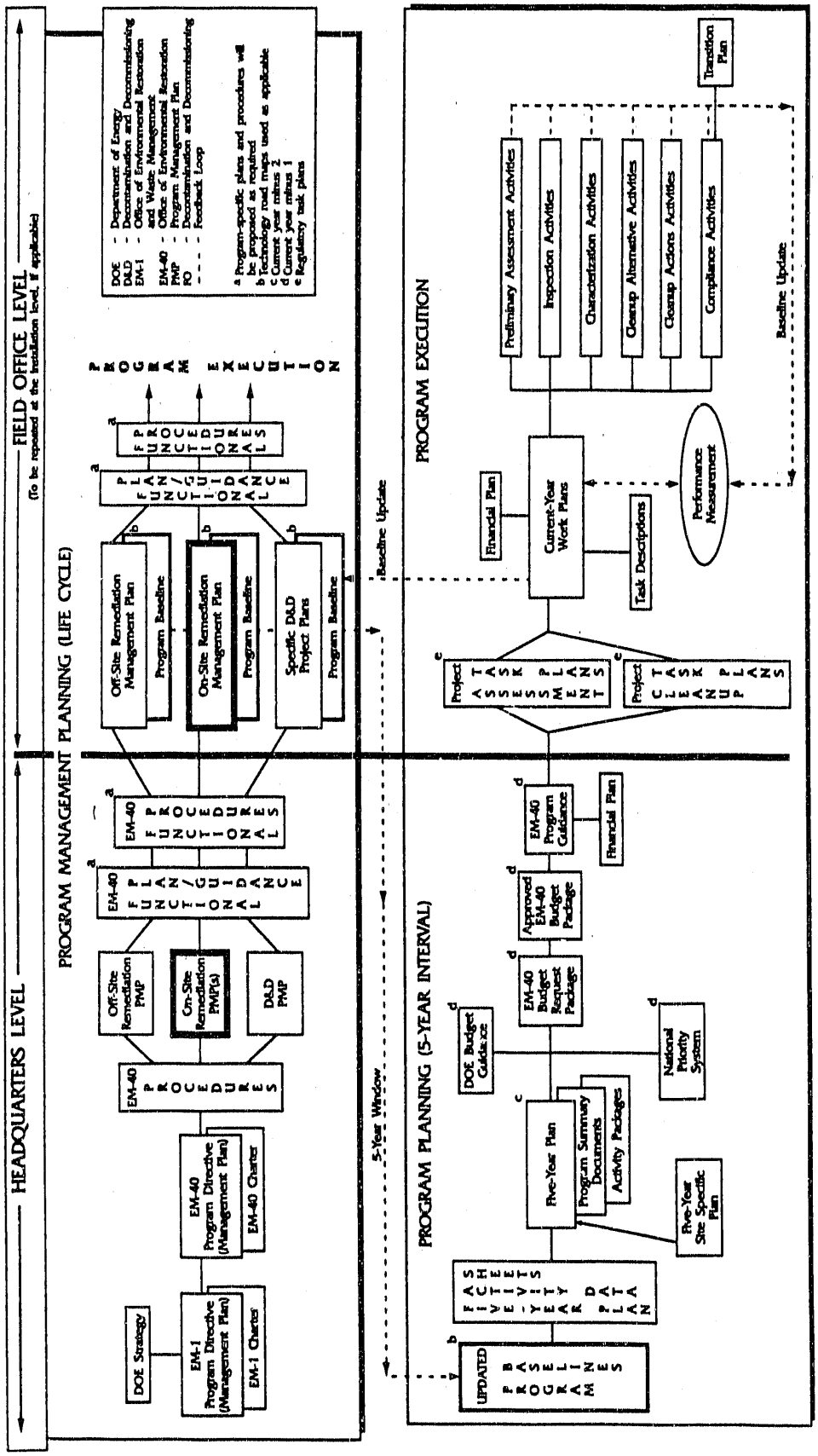


Fig. 7. Organization scheme of planned management documents for the Office of Environmental Restoration and Waste Management.

for the development and implementation of the National Prioritization System. This system, which will be used as a decision aide in DOE ER Program budget allocations and will support the five-year planning process, requires public and EPA acceptance. Because of the public concern for environmental issues and the technical nature of the system, a team was developed to address both programmatic/public and technical issues. HAZWRAP supported the publication of a conceptual design report (CDR) in May 1990 for a system capable of using risk (environmental, health, socioeconomic) to prioritize planned field office activities within the organization and defining the best allocation of planned funds to support the work. Various reviews by internal and external peer groups took place to critique the design. Trial application tests to the FY 1992 budget occurred.

In a continuing effort, the HAZWRAP ER Program supported the ongoing activity of the June 1990 Environmental Restoration and Waste Management Five-Year Plan preparation at HQ. Several HAZWRAP personnel, as a special liaison team, supported this effort. Of the people identified in the Introduction to the Plan, a HAZWRAP person was identified as one of nine key contributors to the ER section of the plan, and three of five persons identified in the Editorial and Policy Coordination Section were from HAZWRAP.

The following is a list of additional accomplishments for FY 1990.

- Supported ER Program Manager's meeting in Sacramento, California.
- Participated in HQ visits to Los Alamos National Laboratory (LANL), Savannah River Site (SRS), Feed Materials Production Center, Richland, and Rocky Flats Plant.
- Participated on task force for preparing draft Five-Year Environmental Restoration and Waste Management Site-Specific Plans.
- Reviewed 482 FY 1992 ADSs for HQ.
- Assisted in revising Site-Specific Plan HQ Guidance Outline.
- Traveled to installations to generate health risk index estimates for the Priority System.
- Supported Priority System CDR Internal and External Review Groups meeting.
- Hosted Stakeholders' Forum.
- Participated and evaluated three cost-estimating software demonstrations: the Air Force's Construction Cost Management Analysis System; Independent Project Analysis, Inc.'s HASRISK; and Camp Dresser and McKee Federal Programs Corporation's Superfund Cost-Estimating Expert System.
- Participated on a special team to evaluate remedial investigation (RI) sampling methodologies at LANL.
- Hosted DOE's Collection and Transfer (CAT) Cost-Estimating Handbook comment resolution meeting.
- Hosted two Corps of Engineers/EPA meetings on integration of cost-estimating systems.
- Supported workshop on Preliminary EIS at HQ.

3.4.6 Expected Near-Term Activities

The HAZWRAP ER Program will continue to support the planned activities as described in the previous sections. Depending on possible reorganization of assignments at HQ, these may be altered slightly. HAZWRAP intends to maintain the flexibility to support all HQ needs.

Continued growth is anticipated in the following areas: cost estimating, regulatory support, prioritization system support, Five-Year Plan support, technical support to regulatory document reviews, RDDT&E support, project tracking and reporting, data base and electronic reporting, and management planning.

3.4.7 Long-Term Expectations

HAZWRAP ER operates on a "level-of-effort" basis with activity defined by HQ on a yearly basis. Projections of longer-term expectations are not easily made. As the ER Program at HQ grows and matures, HAZWRAP anticipates expanding and flexing to keep HAZWRAP as a center of excellence that produces quality deliverables necessary to ensure that HQ meets its mission.

3.5 TECHNOLOGY PROGRAMS

3.5.1 Scope of Activities

Technology Programs continues to be the focus of waste management technology activity within HAZWRAP. The charter of Technology Programs, which was organized in 1986, originally focused on supporting the research, development, and demonstration (RD&D) of new and innovative waste management technologies in both the DOE and WFO programs. Activities under this original charter have grown rapidly in those 4 years, as shown in Fig. 8. In FY 1990 this charter was expanded significantly beyond this basic activity, particularly into the areas of waste operations planning, review, and evaluation.

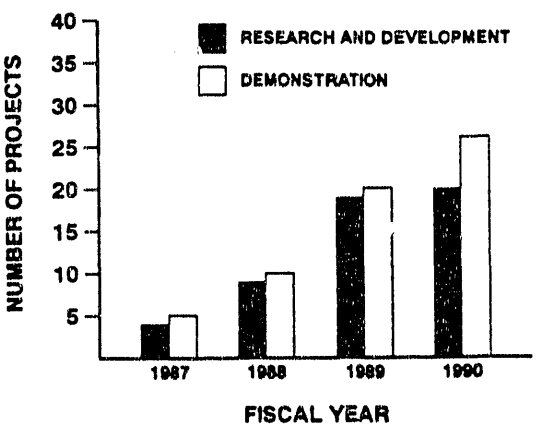


Fig. 8. Growth of Department of Energy Hazardous and Mixed Waste Research, Development, and Demonstration Program with HAZWRAP support.

The activities in support of RD&D within DOE changed dramatically as the Department placed increased emphasis on its environmental activities. The RD&D activities were greatly expanded and consolidated under HQ control, and Technology Programs efforts were more sharply focused on the demonstration program as the year progressed. Tasks included technical oversight of demonstration, testing, and evaluation (DT&E) projects; assistance in the development of program plans; coordination of IAGs; technical review and analysis of proposed new technologies from industry, DOE, and other federal agencies; promotion of technology exchange; and technical support to the DT&E procurement activities. Support to waste operations activities included technology reviews, evaluation of waste handling alternatives, regulatory analysis and impacts, and waste information data review and evaluations. Technology Programs continued to be a key technical resource, its staff working ever harder to maintain a national perspective of both technology needs and potential technological solutions.

RD&D project responsibilities were more direct in the WFO Program. Technology Programs is directly funded and accountable for schedule, cost, and quality of development activities performed by researchers under agreements with HAZWRAP.

Late in the year, a new initiative was undertaken in the area of technical support for the waste operations activities within Energy Systems. This area is expected to expand rapidly in the next year.

3.5.2 Sponsors/Clients

Technology Programs conducts projects on behalf of ORO for the following federal agencies. For simplicity, these discussions describe that work as if HAZWRAP were performing it directly for the agency involved.

Technology Programs provided support to four major sponsors in FY 1990. The primary DOE sponsor of Technology Programs was EM and, within EM, the three major offices of Waste Operations (EM-30),

ER (EM-40), and Technology Development (EM-50). From the WFO Program, the major sponsor was AFESC.

3.5.3 Funding Profile

DOE funding for Technology Programs in FY 1990 was provided through ADSs 451, 452, 453, and 454. The total level of funding by the four major sponsors is shown below:

Sponsor	Funding
EM-30	$ 441,000
EM-40	$ 271,000
EM-50	$2,037,000
WFO	$1,300,000
Total	$4,049,000

3.5.4 Personnel

Sponsors received support from a Technology Programs staff totaling 14 professionals. Five staff members were added to the organization in FY 1990. Supplementing this staff directly were approximately two FTEs of other HAZWRAP staff, supporting needs such as hydrogeology, regulatory analysis, technical editing, and QA. Support for budgeting, employment, and general administrative activities totalled another 1.5 FTEs.

3.5.5 Significant Accomplishments During FY 1990

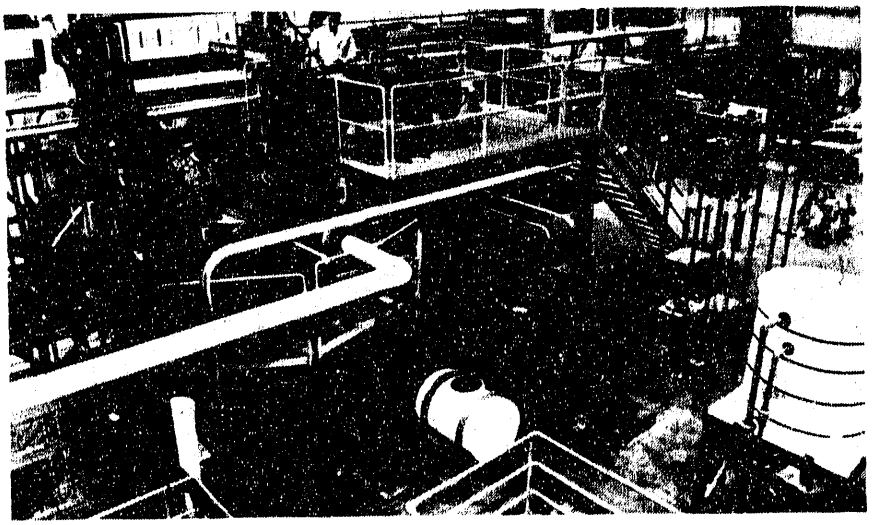
Technology Programs provided important support for producing the mandated "National Report on Prohibited Wastes and Treatment Options." This document was a requirement of the Rocky Flats Federal Facilities Compliance Agreement and was developed in the 120-day schedule requirement. The report documented the initial evaluation of DOE's types and locations of solvent, dioxin, and California list mixed wastes that were out of compliance and provided an initial set of existing and planned facilities available to treat these wastes.

A significant contribution was made by Technology Programs in the Land Disposal Restrictions (LDR) regulations on the final group of hazardous wastes. The "Thirds" report was issued in May 1990. The regulations provided an additional 2-year exemption from the treatment standards for "Thirds" mixed waste. The Case-by-Case Extension will request additional time from EPA to develop the facilities needed to treat these wastes and therefore avoid storing additional wastes in noncompliance status. Specific Technology Programs contributions are listed below.

- Collected baseline capabilities data on all mixed waste treatment, storage, and disposal (T/S/D) units in the DOE complex,
- Collected data on "Thirds" mixed waste for the DOE Complex, and
- Served as a member of the working group on development of case-by-case submission to EPA.

The EM Modernization Study directly supports the EM Programmatic Environmental Impact Statement (PEIS) process by providing the PEIS Team with information on waste streams and T/S/D units throughout the DOE Complex and the factors to be considered in developing system configuration alternatives. Technology Programs activities are listed below.

- developed the chapter on institutional and regulatory constraints,
- provided waste stream data for Quick Look Study,
- developed low-level mixed and hazardous waste chapters for the Quick Look Study, and
- collected data on all T/S/D units and waste streams in DOE complex to support next level of system configuration development.



The Plasma Arc Centrifugal Reactor at Butte, Montana, is a cooperative Department of Energy/Environmental Protection Agency project.

An extremely important contribution of Technology Programs to the DT&E program was in the development of the integrated demonstration concept, the basic building block of the "new culture" in DT&E. At HQ's and ORO's request, Technology Programs played the role of coordinator and facilitator in bringing together the technical resources from around the DOE complex to concentrate on an environmental restoration issue of general interest. The credibility resulting from a reputation of impartiality allowed Technology Programs to play the key role in developing the teamwork and project structure that resulted in the success of the first integrated demonstration experiment at SRS. In promoting the success of the SRS project, Technology Programs also provided important technical assistance to the project manager at SRS and leadership for two of the technical teams.

Technical support was provided to EM-50 in the planning and development of the new technology development program. Important experience and knowledge gained by Technology Programs staff in the past 4 years were valuable resources. Staff assisted DOE in organizing the many individual site RD&D efforts into a coordinated national program and were key in the selection of ORO as the DT&E Program Coordination Office.

Technical oversight of Research and Development and DT&E projects was provided to EM-50, including project evaluation and review. Under the new program, significant increases in the number and complexity of projects required increases in the level of effort required to maintain the important national overview provided by Technology Programs.

Technical support was provided to the DT&E procurement activity, the key element of which is a Program Research and Development Announcement (PRDA) being issued by ORO. Technology Programs supported the development of statements of work for each of the 15 to 20 sites being considered for inclusion in the PRDA. Important contributions in the development of the process, including draft evaluation criteria, were made based on the extensive experience gained in similar procurement activities.

Technology Programs provided technical support in the evaluation of the Oak Ridge K-25 Site drum storage issue with regulatory analysis, technology review, and technology exchange.

Technical support was also provided to the ORO Central Waste Management Division through assistance in the strategic planning for hazardous and radioactive wastes, LDR compliance, evaluation of alternative waste treatment systems for radioactive mixed waste solids, development

of a feasibility study for a radioactive waste disposal facility, and delisting activities.

An important activity in support of EM-40 and EM-50 was the promotion of technical communication within the DOE community, other federal agencies, academia, and industry. To help accomplish this objective, Technology Programs sponsored the following technology exchange workshops.

- DOE/Air Force Joint Technology Review, February 6-8, Atlanta, Georgia;
- DOE Biotechnology Review, April 10-11, Idaho Falls, Idaho;
- Real-Time Subsurface Monitoring of Groundwater, April 17-18, Dallas, Texas;
- Thermal Treatment of Soil/In Situ Vitrification, August 8-9, Richland, Washington; and
- Tenth Oak Ridge National Laboratory Life Sciences Symposium, May 21-24, Gatlinburg, Tennessee (cosponsor).

Other technology exchange activities included

- organizing and chairing a session at the Environmental Waste Management Meeting of the American Society of Quality Control, September 1990;
- organizing a session on Waste Minimization for Spectrum '90;
- serving on the Program Committee of the 1990 DOE Model Conference; and
- presenting an invited paper on DOE RD&D at the 14th Annual Army Environmental R&D Symposium, November 14-16, Williamsburg, Virginia.

Staff provided oversight to the WFO technology development projects. Review and evaluation of progress and technical merit of RD&D performed for DOD sponsors were provided and coordinated with similar projects in the DOE program.

In support of EM-50, Technology Programs led the development of seven new IAGs among DOE, DOD, and EPA for cooperative waste management technology development activities.

Technology Programs presented technical overviews of the DOE DT&E activities at the DOD Installation Restoration Technology Coordination Group Meeting on June 21 in Annapolis, Maryland. Attendees included key staffers from DOE, DOD, and EPA.

Staff provided technical review and evaluation of proposals received by EPA for that agency's Emerging Technology Program.

At HQ's and ORO's request, Technology Programs entertained Paul Dejonghe of the Centre d'Etude de l Energie Nucleaire/ Studiecentrum voor Kernenergie Laboratory to discuss the technologies being developed and demonstrated in the EM-50 programs.

3.5.6 Expected Near-Term Activities

Technology Programs anticipates a significant increase in the support provided to the Waste Operations organizations at HQ, ORO, and Energy Systems. Activities described previously are expected to expand to include additional work and similar work at additional sites.

Support to the DT&E program of EM-50 is also expected to increase as the program continues to become more focused on the specific needs of the DOE community and improves the cost analysis methodology for assessing return on investment. The ability of DOE to accurately establish costs of remediation and development investment will become increasingly important.

It is anticipated that Technology Programs will contribute significantly to the efforts of EM-30 and EM-40 to assess the RD&D needs of their programs with the important objective of producing better, cheaper, faster, and safer solutions to meet the 30-year goals described in the Environmental Restoration and Waste Management Five-Year Plan.

3.5.7 Long-Term Expectations

It is planned that Technology Programs will continue to maintain and further develop the strong technical base that has proven so important to the nation's waste management activities. As the nation continues to assess and understand the true magnitude of the waste management issues it faces, there will be an even greater need for strong technical knowledge tempered with an understanding of the human and political nature of the "real world." The true strength of Technology Programs is in its knowledge of waste management issues and in its credibility for taking the objective, national view in recommendations to national leadership.

Technology Programs staff use the team approach to address important programmatic issues.

3.6 INFORMATION AND DATA SYSTEMS PROGRAM

3.6.1 Scope of Activities

The Information and Data Systems Program supports ORO by performing a variety of computer systems development and implementation functions covering DOE and WFO activities. The major activity area is the management of the DOE WIN. Other areas of support include a local area network (LAN), which is managed to provide administrative support in the financial and programmatic areas. Technical information services are also provided to assist in conducting literature searches and document acquisition and preparation. Computer systems planning and support are provided to ensure that all staff are equipped with state-of-the-art hardware and software, computer security procedures are implemented as directed by DOE Orders, and training is provided where needed.

Department of Energy Waste Information Network

The DOE WIN was developed to meet the programmatic information needs of EM and was designated as EM's internal management information system to support the DOE Five-Year Plan. WIN's key objective is to provide DOE HQ, DOE Operations Offices, and their contractors with an information management tool to support environmental restoration and waste management activities and to promote technology transfer across the DOE complex. WIN evolved in various stages of growth driven by continued identification and expansion of user needs. The current system provides seven key features: technical information systems (data bases), bulletin boards, data transfer, on-line conferencing, formal concurrence system, electronic messaging, and integrated spreadsheet/graphics. WIN is implemented on a Digital Equipment Corporation's (DEC) VAX cluster platform and supported more than 1300 users nationwide at the close of FY 1990. An interactive menu system, DEC's ALL-IN-1, provides easy access to all applications.

WIN's features are designed to provide the DOE environmental management community with information management tools that are accessible, functional, and efficient (Fig. 9). The type of tool required depends on the task to be performed, and WIN is equipped to serve many different needs. Each component of the system is evaluated for effectiveness for a particular purpose, ease of use, and quality of operation. The system is fully supported by project managers, systems analysts, and user assistance technicians to ensure continued, uninterrupted service to subscribers. As WIN continues to expand in scope and capabilities, upgrades will be made to streamline system access and to simplify data updating and retrieval. Constant attention to quality by system developers and operators and to user feedback keeps WIN in the forefront of environmental restoration and waste management information technology. During FY 1990, three major information systems were implemented [PB&C, Environmental Restoration Information System (ERIS), and Waste Management Information System (WMIS)], and a series of enhancements was made to WIN's information transfer features (i.e., bulletin boards, data file transfer, and electronic messaging).

Waste Information Network Key Feature Descriptions

Technical Information Systems

Technical information systems were developed during FY 1990 to support DOE and WFO activities. With respect to the DOE support areas, a structured analysis

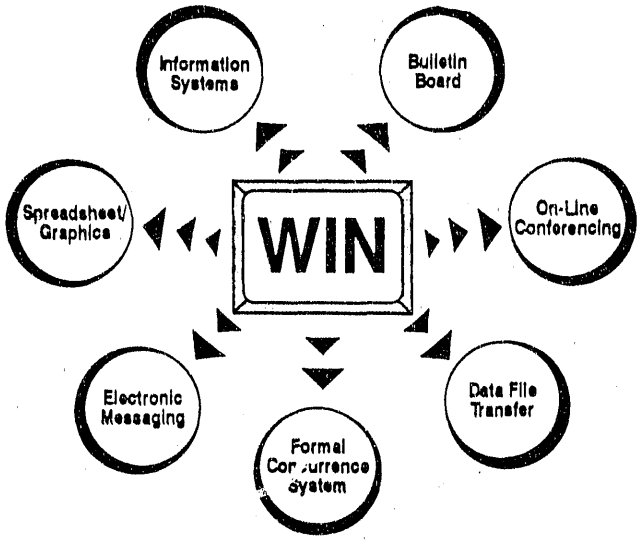


Fig. 9. Department of Energy Waste Information Network key features.

study conducted during FY 1988 evolved into an effort to define a flexible data model that would support current environmental restoration and waste management information requirements and could be readily adjusted to meet future information needs. Data models have been developed that cover requirements for PB&C, ERIS, and WMIS activities. The data requirements for these models were defined and reviewed by representatives from DOE HQ, field offices, and contractor installations. Collectively, these three models function as an overall "corporate" model that will be expanded to include other key topics of significance to DOE's environmental restoration and waste management programs.

DOE Planning, Budget, and Control Information System

The PB&C system was initiated through the development of a central data base on WIN that encompassed the ADSs as required by the DOE Five-Year Plan. As new requirements for the FY 1993-FY 1997 Five-Year Plan were defined, an effort began during September 1990 to expand the data base into a major information system that supports EM's planning, budget, and control needs during Five-Year Plan implementation.

Environmental Restoration Information System

ERIS is designed to provide DOE HQ with a mechanism for tracking and reporting the overall status of environmental restoration and remedial action activities by providing cost, task, and release site data in a timely manner. DOE HQ is able to examine budget allotments and actual vs projected costs to assist in financial decision making. Task descriptions and milestone data are available in scheduling and reporting activities. Potential release sites and known or suspected contaminant information aids in the prioritization of preventive and remedial efforts. For the field, improved reporting of current, accurate, and consistent data on environmental restoration activities is made possible with generation of standard or ad hoc reports to aid in status tracking and decision-making functions.

Waste Management Information System

The primary objective of WMIS is to serve as a central resource for data on waste T/S/D activities in the DOE complex. The data model developed to date classifies the requirements into three major areas: T/S/D capabilities, waste profiles, and waste generation/process data. These requirements represent an expansion to the existing data collected during FY 1990 on land disposal restricted mixed wastes, including storage capabilities and capacities and treatment options. Waste minimization efforts are also supported by this information system, as attempts are made to identify processes that could generate fewer wastes by improving technology, equipment, procedures, or components.

Argonne National Laboratory-East, Waste Tracking System

A personal computer (PC)-based Waste Tracking System was installed at Argonne National Laboratory-East (ANL-E) on October 1, 1990. The system satisfies two major requirements: (1) on-site management system for tracking radioactive and hazardous wastes and (2) an electronic data submission system for the central WMIS on WIN. Funding was provided to HAZWRAP to collect the requirements and develop a system that would meet ANL-E's needs for tracking and reporting waste operations.

Air Force Logistics Command Pacer Reduce Information System

Significant progress was made in the development and implementation of the AFLC Pacer Reduce Information System. Specifications for the system were collected from all seven AFLC bases, and a prototype was established at Tinker AFB to demonstrate the functionalities of the system. The system provides an electronic method for tracking hazardous waste generation and serves as a central means for reporting to the states and HQ AFLC.

Bulletin Boards

The key objective of the bulletin boards is to support DOE's environmental restoration and waste management programs in highlighting and tracking major program initiatives and to promote information exchange within the DOE community. WIN's electronic bulletin board feature is designed to organize an immense volume of timely information into categories that may be searched and viewed according to specific areas of interest. The bulletin boards provide a quick means of scanning timely information on environmental compliance issues, upcoming conferences and workshops, and DOE policies. Significant enhancements were made during FY 1990 to the bulletin boards.

Data Transfer

One of the most innovative information and technology transfer features of WIN is the data transfer capability. Specialized software on WIN allows PC users to exchange data or program files in a matter of minutes, no matter what type of file or information is transferred. Using industry standard communication protocol, users can easily upload data files to WIN and send them to other users, who may then download the files back to their local PC. Data file transfer is an excellent mechanism for electronic transmission, review, and concurrence of program-related documents in a timely and cost-effective manner.

On-Line Conferencing

The on-line conferencing feature of WIN, which was added during FY 1990, provides users with a means of participating in electronic meetings and conferences regardless of geographic location. It may also be used as an interactive bulletin board allowing notice posting and response without the need for all parties to be on-line at once. The software is being customized for WIN users.

Formal Concurrence System

The automated reporting and concurrence feature designed to support EM provides a cost-effective method for issuing and obtaining field review and concurrence of major program documentation. The system routes documents to a sequence of authorities who may approve, annotate, or reject the electronic document according to predetermined permits. The system uses a person's password as the "signature," thereby securing against unauthorized access to formal documents. The system was

developed through a joint effort between the DOE Albuquerque Operations Office and DEC and was tested during FY 1990 using the ADSs.

Electronic Messaging

Electronic messaging continues to be an excellent program management tool, as well as an efficient and effective communications medium. This feature has been the central mechanism for sending and receiving memorandums, reports, data files, and other information to and from hundreds of users nationwide within seconds. During FY 1990, enhancements to this feature were implemented and tested, with release to all users planned during early FY 1991.

Integrated Spreadsheet/Graphics

WIN supports user numerical analysis needs by offering a spreadsheet/graphics capability from within the ALL-IN-1 menu system. The capability, which is being customized, provides features expected in a quality electronic spreadsheet program and permits users to operate in various menu styles that are similar to popular PC programs. Work was initiated during FY 1990 on customizing this feature to support specialized summary budget reporting from data received on ADSs.

3.6.2 Sponsors/Clients

The Information and Data Systems Program conducts projects on behalf of ORO. For simplicity, the work is described as if HAZWRAP were performing it directly for the agency involved.

There is a recognized need for the WIN system, which is reflected by the number of sponsors and clients (subscribers) supporting and using the system. The sponsors of WIN are depicted in Fig. 10. The users of WIN are viewed as clients because they help establish what the system needs to provide in fulfilling their requirements. These users reside throughout the DOE system and include DOE personnel in Washington, D.C., and the various field offices; DOE contractors; and subcontractors and consultants. Users representing WFO organizations include the AFLC, Army, ANG, and EPA. A map indicating the locations of the users is included in Fig. 11.

3.6.3 Funding Profile

Total FY 1990 funding provided by the various sponsors for the major activities is given in Table 3.

3.6.4 Personnel

The Information and Data Systems Program staff consists of a program manager, four project managers (two are on loan from peer organizations within HAZWRAP), an information services coordinator, a University of Tennessee mixed waste intern, and a secretary. Two additional staff are on loan from Energy Systems' Instrumentation and Controls Division. The on-site staff have skills in the areas of administrative management, engineering, and computer systems. Additional personnel necessary to develop and maintain the various features of WIN include 3 FTEs in the Data Systems Research and Development Division, 2 FTEs in the Computing and Telecommunications Division, and 26 FTEs from support contractors.

3.6.5 Significant Accomplishments During FY 1990

The major accomplishments for the Information and Data Systems Program during FY 1990 are described in the following paragraphs:

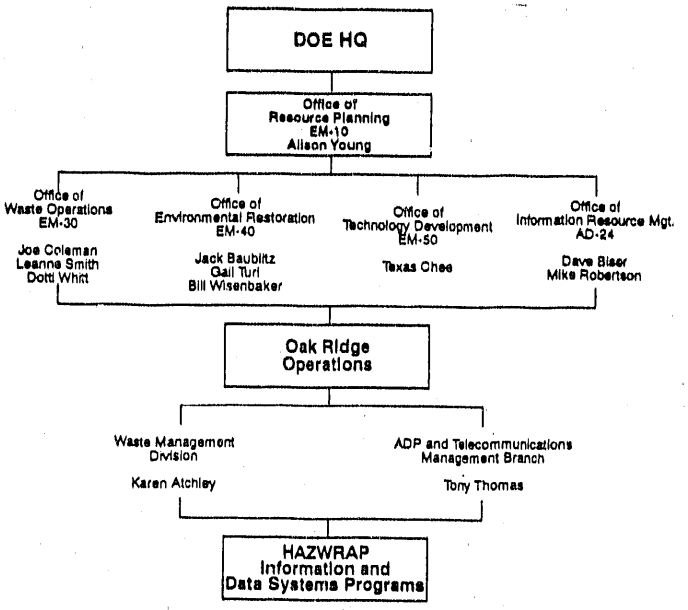


Fig. 10. Department of Energy Waste Information Network sponsors.

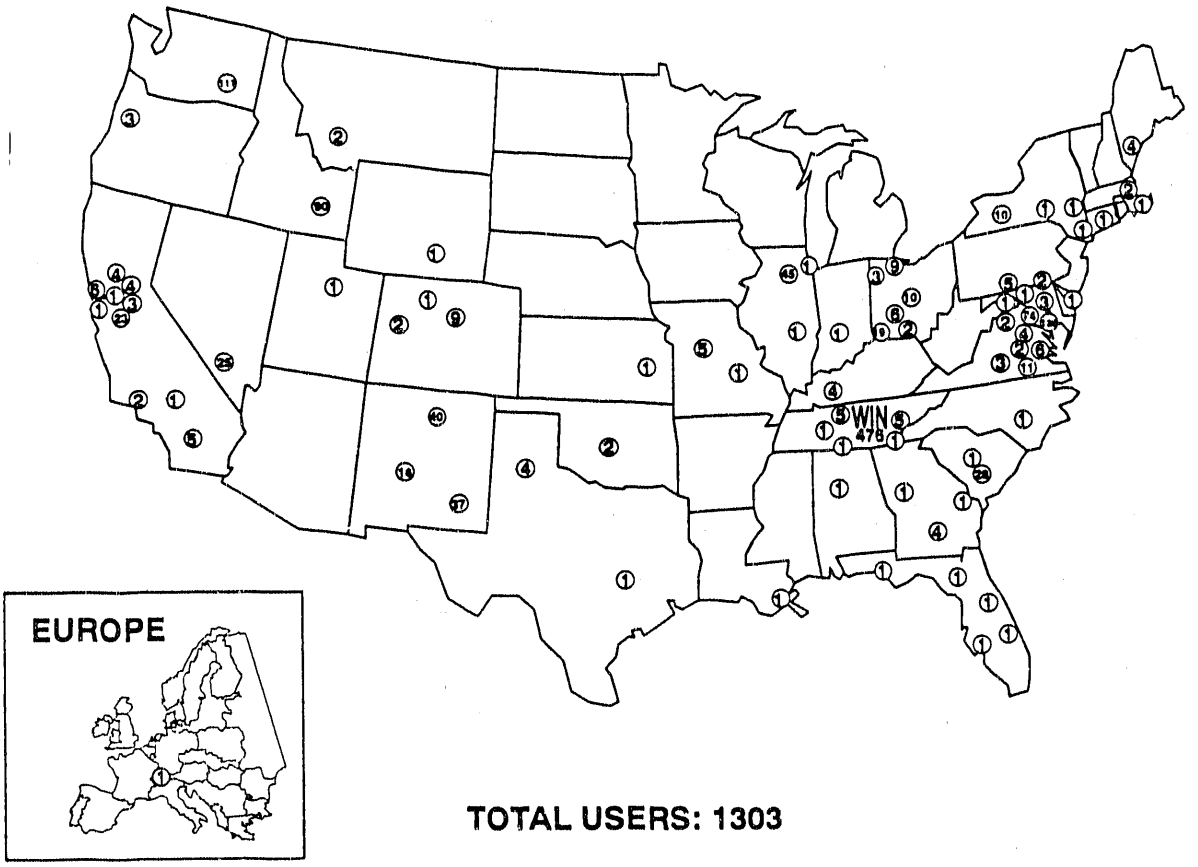


Fig. 11. Distribution of Waste Information Network users as of October 1, 1990.

Table 3. Total FY 1990 funding by major activity

Sponsor	Funding ($ thousands)
Department of Energy (DOE) Information Systems	
Planning, Budget, and Control Information System	326
Waste Management Information System	1632
Environmental Restoration Information System	2161
Information Transfer Applications	176
Telecommunications Upgrade	117
Program Management and User Support	886
System Upgrade	
Operating	1201
Capital	273
System Operation	263
Argonne National Laboratory-East	80
Air Force Logistics Command Pacer Reduce Information System	165
Headquarters Air Force Defense Environmental Restoration Account Management Information System	15
Total DOE funding	7295

Planning, Budget, and Control Information System

- Structured a central ADS data base on WIN containing all ADS submissions from the DOE field offices.
- Developed an on-line retrieval method for browsing the ADSs.
- Implemented a summary reporting feature to search ADSs and sort output by operations office, installation, program category, and priority.
- Developed a Natural Language Interface application.

Waste Management Information System

- Collected Mixed Waste T/S/D Capabilities and Waste Profiles data covering 26 DOE installations and implemented a data base on WIN.
- Developed ANL-E Waste Management Tracking System.

Environmental Restoration Remedial Action Information System

- Prototyped and tested Natural Language Interface capability for release site data.

- Completed Field QA of release site data.
- Completed ER On-Site Remediation Data Base Security Implementation Plan and System Definition.
- Incorporated ER program management information (task and budget) into the data base.
- Provided customized Natural Language Interface capability to users.
- Completed On-Site Remediation Data Base (release site, task, and budget data).

Waste Information Network Telecommunications Milestones

- Procured hardware to upgrade telecommunications and system performance.
- Implemented ALL-IN-1 to Profs interface for electronic messaging.

Waste Information Network User Support

- Developed bulletin board enhancements relating to regulatory and compliance tracking issues.
- Compiled WIN User Reference Guide.
- Provided on-site and off-site training at HQ and all field offices.
- Developed a data entry, retrieval, and reporting system to support the AFLC Bases.
- Provided environmental management data support to the Defense Environmental Restoration Account Management Information System (DERAMIS).

3.6.6 Expected Near-Term Activities

The planned near-term activities relate primarily to defining and documenting requirements for FY 1991 support to EM. A Requirements Definition Document will be prepared during December 1990 for approval by EM-2. Continued development of the PB&C, ERIS, and WMIS will be a focal point for near-term activities. Improvements in WIN's telecommunications capabilities will be made to enhance users' access. The AFLC Pacer Reduce Information System will be implemented at all AFLC bases by December 1990.

3.6.7 Long-Term Expectations

Long-term plans for the Information and Data Systems Program are expected to be primarily related to a significant expansion of the WIN system and its support role as a "major information technology initiative" for DOE. Expansion into new areas of support are also expected with other federal agencies. As new requirements are defined, WIN will be able to meet the needs of its users because of the system's flexibility. During FY 1991, hardware and software upgrades are expected to be required, based on WIN's significant growth in its user base.

3.7 NAVY PROGRAMS COORDINATION

3.7.1 Scope of Activities

HAZWRAP's Navy Coordinator (NAVCO) is responsible for providing technical management and coordination support to HAZWRAP. Since 1988 this position provided an integrated overview by HAZWRAP of all work efforts under way for the Navy. The HAZWRAP NAVCO provides coordination on all HAZWRAP efforts associated with the Navy's Installation Restoration Program; the Navy's Hazardous Materials/Hazardous Waste Programs; the Navy's Environmental Data Management Development; the Navy's Oil Spill Prevention, Response, and Contingency Planning Program; the Navy's Occupational Safety and Health Deficiency Abatement Program; and other environmental projects. The NAVCO is responsible for initiation and coordination of new projects and coordination of current ongoing efforts that support the sponsor.

3.7.2 Sponsors/Clients

The NAVCO conducts projects on behalf of ORO. For simplicity, these discussions describe that work as if HAZWRAP were performing it directly for the agency involved.

The NAVCO position is sponsored by HQ, NAVFAC's Environmental Quality Program. Clients include NEESA, NAVSEA, the Chief of Naval Operations Office, Engineering Field Divisions, as well as HQ NAVFAC.

3.7.3 Funding Profile

HQ NAVFAC funded this support task in the past as follows: $50,000 - FY 1988; $50,000 - FY 1989; and $27,700 - FY 1990. The projected funding for FY 1991 is $54,675. The proportionately reduced level of funding in FY 1990 was not provided until early May 1990 because of funding limitations incurred at HQ NAVFAC. The funds limitation held NAVCO support in abeyance until the third quarter of FY 1990.

3.7.4 Personnel

The NAVCO position is a part-time tasking requiring approximately 40 to 50 hours per month. The position is currently filled by a staff member from HAZWRAP's Pollution Prevention Program.

3.7.5 Significant Accomplishments During FY 1990

Funds limitations during FY 1990 caused a much reduced scope of support to NAVFAC. However, the following efforts have been accomplished since May 1990. In May the NAVCO, in conjunction with other HAZWRAP project managers, initiated a new project cost summary reporting format at the request of HQ NAVFAC that depicts task-by-task cost breakdown for specified Navy projects. The NAVCO provided HAZWRAP mission statements and projects data from each program area within HAZWRAP that supports Navy efforts to the Space and Defense Technology Program for its presentation to the president of Martin Aero & Naval Systems in late June 1990. The following table indicates the funding level for Navy projects via HAZWRAP:

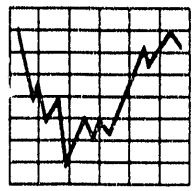
Sponsor	Funding
NAVFAC	$51,105,004 (87.39%)
NEESA	7,351,617 (12.57%)
NAVSEA	25,000 (0.04%)
Total Funding	$58,481,621

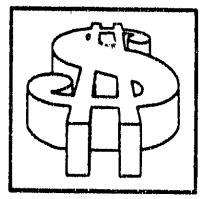
Also during the month of July, a draft charter for the NAVCO position was developed. The charter outlines the scope, authority, and responsibilities of the NAVCO. The charter will be coordinated with and approved by the sponsor once the new Director of the Environmental Engineering Division at HQ NAVFAC is selected. In August, the proposed cost summary format was submitted to the sponsor and subsequently adopted in early September. The new format provides the sponsor's project managers with tools to track individual task assignments and funding levels.

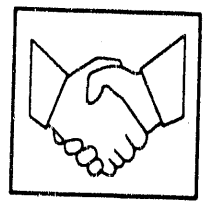
3.7.6 Expected Near-Term Activities

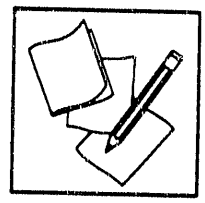
The most pressing matter is to obtain the sponsor's approval on the proposed NAVCO charter. The coordination of the position's scope and responsibilities with the new Sponsor's Program Manager is critical to successful task support. A clear understanding as to what the sponsor requires from the HAZWRAP NAVCO early in the fiscal year is essential. It is of primary concern to HAZWRAP that the NAVCO position function in a manner that will best serve both the sponsor and HAZWRAP, now and in the future.

4. ADMINISTRATIVE OPERATIONS DEPARTMENT









4.1 COST TRACKING AND SCHEDULE CONTROL

4.1.1 Scope of Activities

The Cost Tracking and Schedule Control (CTSC) group is responsible for developing and operating major components of the Program Management System (PMS), which provides managers and staff members of all HAZWRAP organizations with information to effectively operate their programs. Development activities support Division senior managers and program managers in assessing programmatic needs, establishing goals, and developing technical and administrative plans for meeting them. Operational responsibilities include cost and milestone tracking, reporting, and system maintenance and information resource management for the PMS.

The cost and milestone tracking function includes maintenance of the Financial Management Data System, subcontractor invoice control, baseline control of project and program data, and tracking cost and billable hours of 8(a) contract technical support staff.

The **Financial Management Data System** tracks account data not stored by the Energy Systems accounting system and generates reports by combining these internal data with mainframe computer data in custom formats. This system also supports a centralized invoice processing function and provides invoice cost status reports for each subcontract. The system is used to coordinate approval and payment status of subcontractor invoices among vendors, project managers, finance officers, and Accounts Payable. The Project Cost and Funding Tracking and Reporting System defines, controls, and provides status reports on HAZWRAP WFO projects. The system tracks incremental funding and cost status, and these data are used to produce monthly status reports at the project, program, and sponsor levels.

The **Program Control System** (PCS) provides control of baseline data (project scope, milestones, and team members) on projects in the HAZWRAP programs for RAP, AIRHAS, and Pollution Prevention. The PCS provides for (1) data collection and program monthly reports on milestone status and project manager technical and administrative work load and (2) an assessment by the project manager of potential problems and sponsor satisfaction with project progress.

CTSC maintains a cost tracking system to distribute the cost of 8(a) support personnel performing a variety of services on HAZWRAP projects. CTSC also assists with the development and maintenance of HAZWRAP administrative procedures and with the preparation of associated training materials. The customer body for these services includes managers and staff members of all HAZWRAP organizations and DOE and HAZWRAP sponsors.

4.1.2 FY 1990 Budget

CTSC accounted for 8% of the HAZWRAP internal operating expenditures in FY 1990. The following table indicates how the CTSC budget was used.

Labor	$156,000
Subcontracts	448,000
Other materials	51,000
Services	1,000
Total	$656,000

(Note: The CTSC budget for FY 1990 included some labor and subcontracted support for the finance and 8(a) program support staff.)

4.1.3 Personnel

CTSC includes two Energy Systems' employees and seven 8(a) contractors in technical and administrative staff roles.

4.1.4 Significant Accomplishments During FY 1990

- **Implemented Token Ring Local Area Network.** CTSC staff planned and executed the installation of the computer network used to support the Administrative Operations Department coincident with HAZWRAP's move into the Tri-County building. The architecture for this system grew from two separate four-user Ethernet LANs to a Token Ring LAN with 16 financial and cost-tracking users and four editor users. The move necessitated many adjustments to equipment, software, and procedures, yet it was accomplished with no major interruptions to operations at one of the busiest times of the fiscal year. Reports and data processing continued to meet schedule requirements. Following the initial installation, the CTSC group continued to define the LAN with improvements to existing features and the addition of new functions. These improvements allowed much more complex computer operations to be performed. The development of the rationale, requirements, and a detailed schedule for documenting existing data systems on the LAN began. CTSC sponsored an evaluation of Computer-Aided Software Engineering software products suitable for PC data base systems used by HAZWRAP. The recommended product was purchased and installed to begin modeling and documenting internal data systems.
- **Participated in a Performance Improvement Process (PIP) team that developed a method for identifying inconsistencies between Energy Systems billings and the HAZWRAP WFO monthly cost reports.** Such inconsistencies had become a major concern of WFO sponsors and had delayed certification of billings for payment. CTSC developed a report for the Finance Section to review these data for inconsistencies each month. The reviews also revealed that changes in the use of accounting numbers by other Energy Systems organizations had created a unique reporting problem for HAZWRAP because of its commitment to reporting prior-year cost on long-running projects. CTSC identified the problem and modified the data keys in the Financial Management System to accommodate both requirements.
- **As part of the CTSC group's continuing efforts to improve recurring operations, completely internalized and integrated the financial cost reporting process to facilitate report generation and distribution.** All of the compilation, collation, and sorting of cost reports previously performed manually is now done by computer. The collective improvements from this programming effort now save Administrative Operations 3 to 4 person-days each month. CTSC also developed a schedule of the activities required to prepare standard cost reports, which was then optimized to improve and further automate the computer procedures associated with obtaining cost data. Reports are now often delivered 2 days ahead of the original schedule.
- **Added the Pollution Prevention Program to the PCS; Baseline, Profile, and Status Reports have been generated each month since February.** This achievement demonstrated the new capability of the PCS to track project-specific milestone data.
- **Initiated and directed the design, development, and implementation of a LAN-based Personnel Information Management System (PIMS) as a more effective PMS data system.** When fully operational, the system will support staff planning, personnel requisition, employee tracking, and space utilization functions from a central data base. Available reports will include program staff lists, organization charts, and a telephone

directory. Training requirements will be listed by position, and training accomplishments will be listed by employee. A structured software design method was used to develop and implement the design. Initial installation of the system prototype for testing by the administrative staff was completed.

- **Initiated and directed a contractor study of all functions performed by HAZWRAP staff pertaining to placement of 8(a) task orders and certification of invoices.** Results of the analysis will be used to develop procedures for conducting 8(a) business and for improvements to the data systems used to support them.

4.1.5 Expected Near-Term Activities

- **Enhance PMS LAN applications. Improve LAN operations.** CTSC staff will continue to evaluate potential solutions to two problem areas affecting the PMS. One concerns the need for a more effective and efficient method of providing data and system backups to a growing data system. Several options for automating existing backup procedures are being reviewed. The other problem area involves the amount of computing memory available for applications and files on PCs working in the LAN environment. Inadequate memory can make operation of some applications impossible. CTSC proposes to evaluate some of the recent technological advances in computer operating systems, such as IBM OS/2, to determine whether these problems can be alleviated with a minimal investment.
- **Enhance PMS LAN applications.** CTSC identified the following opportunities to improve the effectiveness of existing PMS subsystems:
  Financial Management System. Much of the data processing in this system is performed to track subcontracts and the accounting system work orders used for subcontract cost. CTSC intends to develop models of work order processing and data requirements and analyze them for deficiencies. This is an important prerequisite to further system enhancements designed to track and report all program commitments, including those for 8(a) task orders. CTSC also plans to develop a Budget and Accounting Change data system to decentralize the preparation of these documents and increase control of their contents. Another major activity will be to define, design, and implement a LAN Report Access Application that will allow broader access to data and reports stored in the system.
  8(a) Program Support System. The results of the business analysis conducted on this system will be evaluated and incorporated into a revised procedure for conducting 8(a) business and for improvements to the data systems used to support them. The CTSC group also plans to integrate the various financial functions associated with 8(a) tasks with relevant Financial Management System components.
  PIMS. Upon completion of the testing phase for the PIMS prototype, the system will be installed for use by the HAZWRAP administrative staff and cost center managers. As training and final testing proceed, the next phase of requirements for supporting Division training requirements with the system will be defined for later incorporation. In addition, a request will be made to Computing and Telecommunications to begin using the Technical Directory for recording experience records of Division personnel for use by the Director and his administrative staff.
- **Integrate PMS.** CTSC will proceed with documenting a cost-benefit analysis for implementation of the Integrated Management Planning And Control (IMPAC) system at the K-25 Site by

HAZWRAP. This analysis will identify all of the project and program management functions that could be performed in the IMPAC system and the PMS components currently used to perform that work. The analysis will be further developed into an implementation plan to propose transferring specific functions to the IMPAC system.

4.1.6 Long-Term Expectations

CTSC will to continue to develop the requirements and standards for documenting existing data systems in the PMS. The resulting standards and methodology will be used to standardize the control of the computer system elements of the PMS.

4.2 FINANCE

4.2.1 Scope of Activities

Responsibility for the financial management of HAZWRAP is assigned from and administratively reports to the Office of the Controller. The Finance Section of HAZWRAP is a functional part of the Administrative Operations Department and functions as a part of the Division's team effort.

The section is responsible for

- providing financial management support for all aspects of the organization, including budget preparation, cost projections, and variance analysis;
- maintaining a current and accurate record of funds received from sponsors;
- providing individual and group consultation and training to program and project management;
- providing meaningful and appropriate accounting and cost control;
- serving as the primary interface for financial issues between HAZWRAP and other organizations; and
- providing senior management with financial information useful for making informed decisions.

In an effort to maintain an open line of communication on financial issues between HAZWRAP's top managers and the support structure, the Division established the Financial Review Group (FRG). The group is composed of the business/finance manager, Division finance officers, Division Director, Deputy Division Director, and cost center/program managers. The group meets once a month and at other times as deemed appropriate to remain current on the Division's financial status. Special emphasis is placed on the management of the Division's cost center budgets/costs. It is within this group that the Division's cost center budgets and standard charge-out rates are defined and revised.

4.2.2 Funding Sources, Budgets, and Cost

HAZWRAP has two major funding sources: DOE and WFO. Figures 12-16 reflect the funding and costing trends of each source. The finance section is responsible for assisting the project management organization in controlling its budget and maintaining the integrity of the costs incurred for tasks funded by each of the individual sources. For the DOE tasks, a budget is requested and provided based on congressionally approved budget and reporting classifications with a further breakdown by ADS number. Budgets are requested 2 years into the future using the ADS document format. For the WFO tasks, a budget is requested at the onset of a project and is provided incrementally over the duration of the project, with revisions in scope and/or budget requirements as appropriate. However, for management purposes an official budget call for WFO projections is made by DOE and input is supplied in conjunction with the DOE funded projects budget call.

4.2.3 Personnel

The Division's Finance Section is composed of the finance manager, three finance officers, and four accounting assistants, two of which are 8(a) contract support.

The finance manager is responsible for providing assistance and leadership to the finance officers and accounting assistants to ascertain that the overall needs of the Division are satisfied. The manager is also responsible for applying cost accounting standards, DOE policies, Energy Systems procedures, and other procedures, as appropriate.

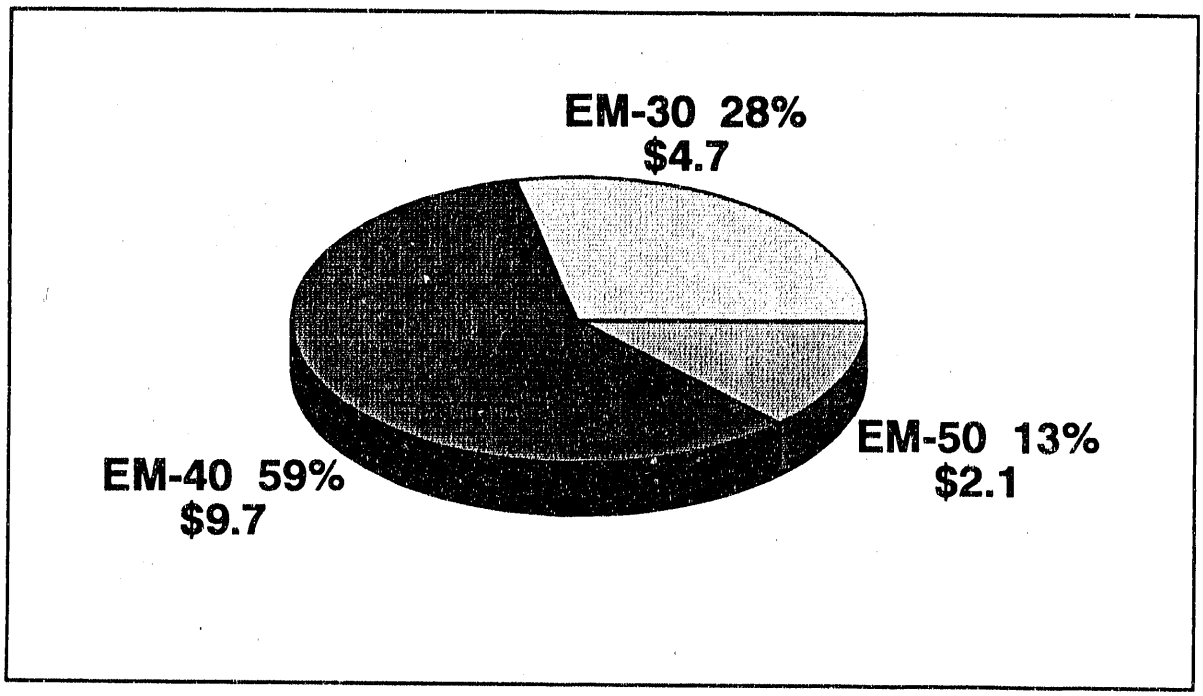


Fig. 12. HAZWRAP Department of Energy programs FY 1990 funding.

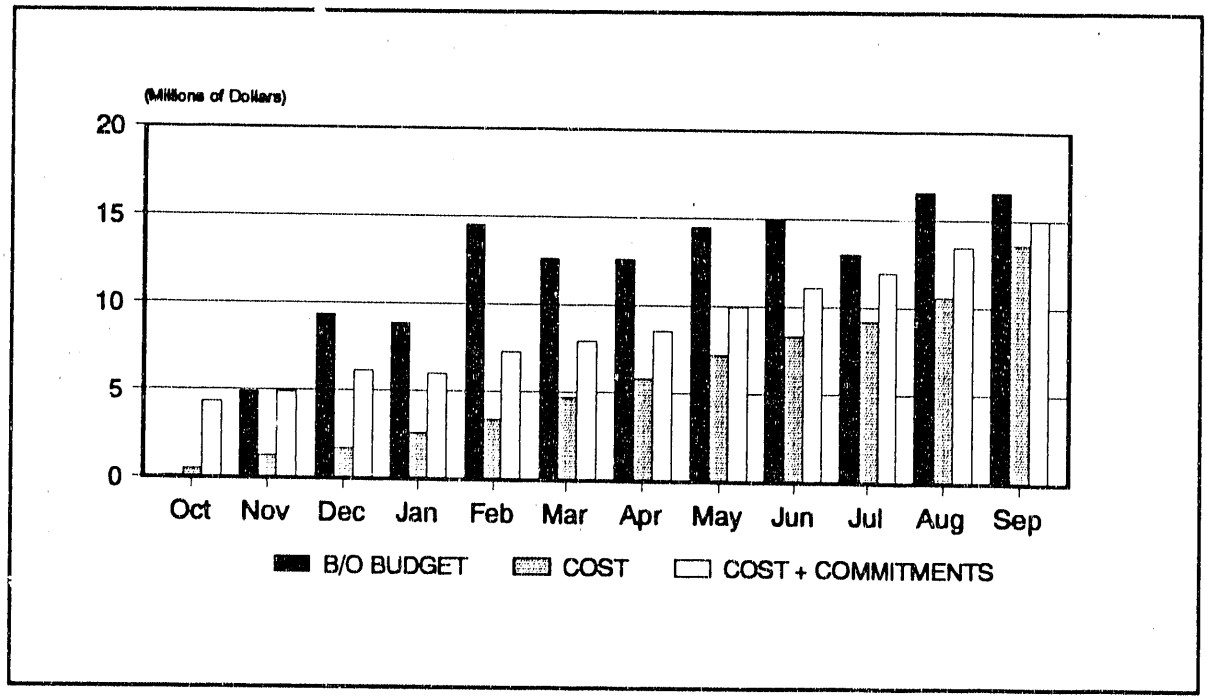


Fig. 13. HAZWRAP Department of Energy budget obligation/cost status (FY 1990).

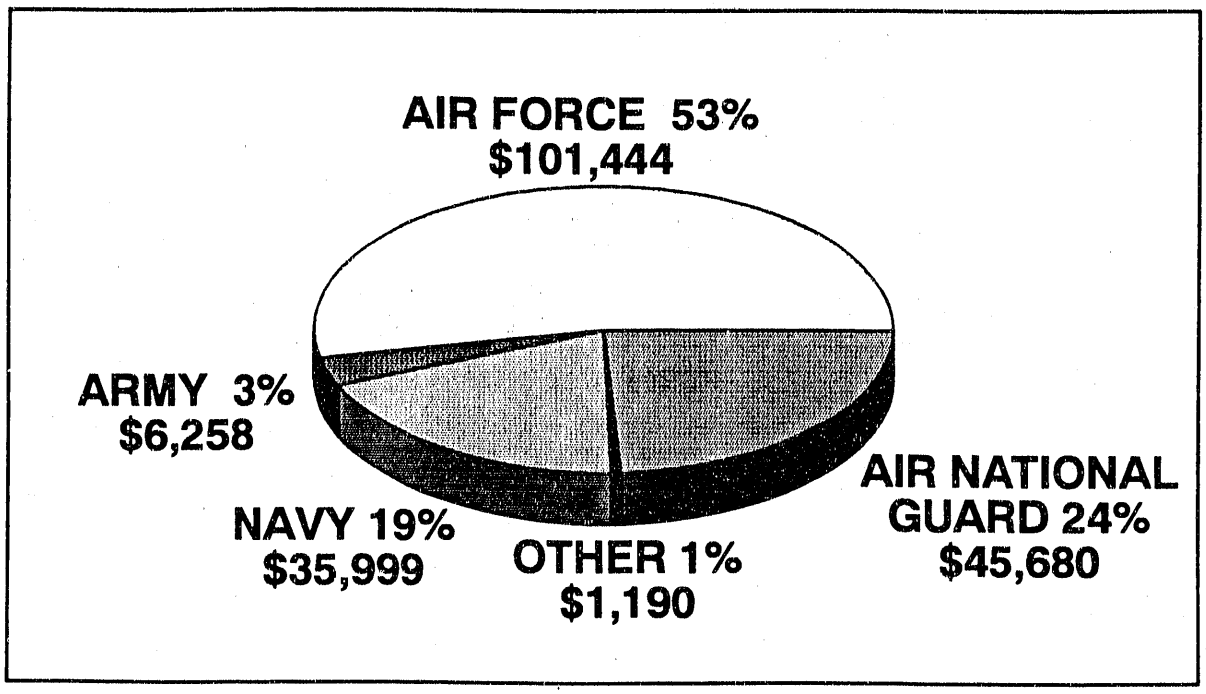


Fig. 14. HAZWRAP Work for Others FY 1990 budget (budget/authority) by funding source.

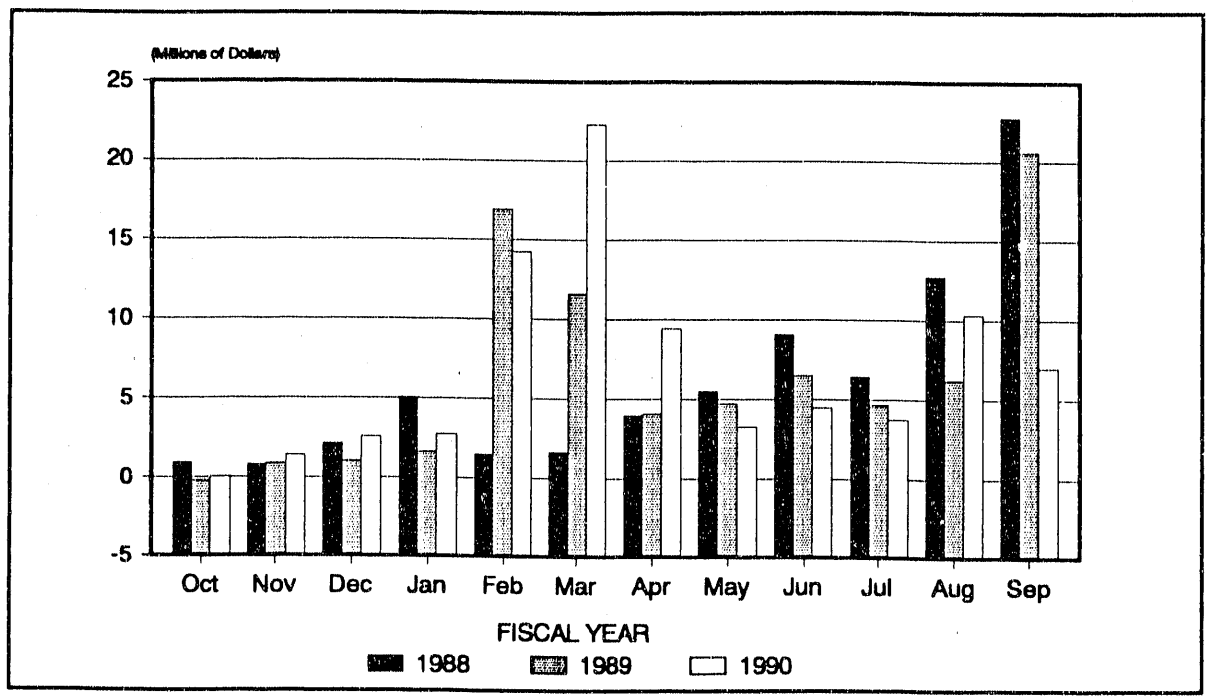


Fig. 15. HAZWRAP Work for Others funding received monthly by fiscal year (FY 1988-FY 1990).

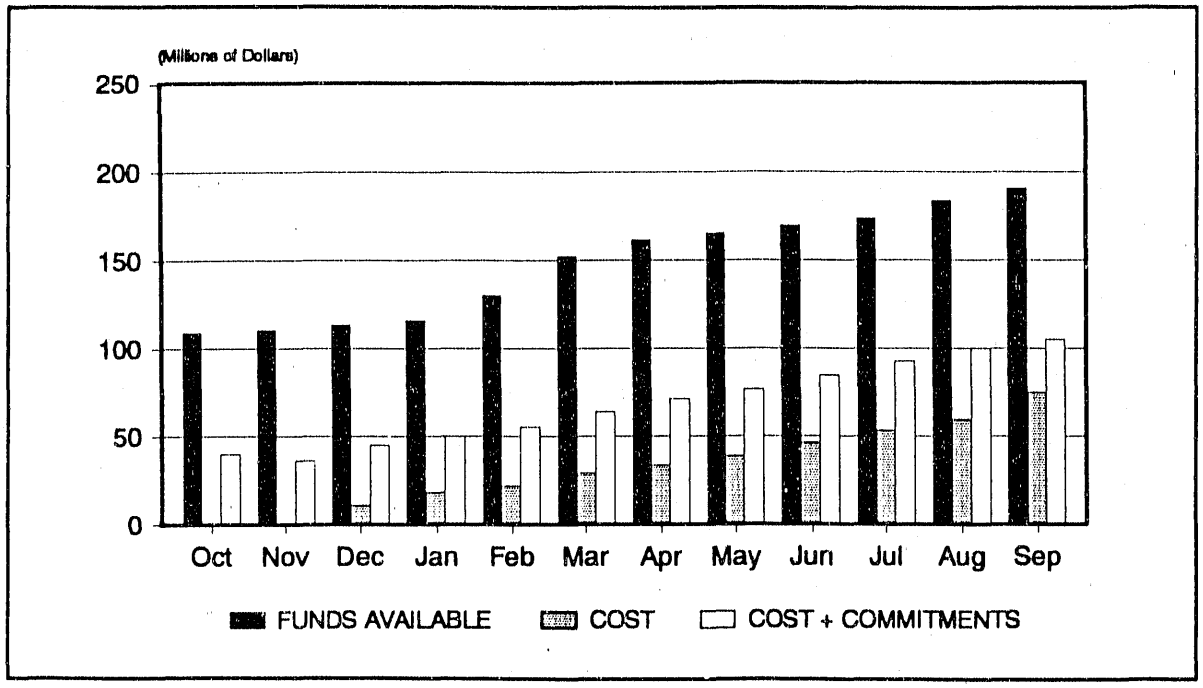


Fig. 16. HAZWRAP Work for Others Programs FY 1990 budget/cost status.

The finance officers are assigned to assist Division personnel based on a cost center/ program manager designation and are held accountable for actions taken in accordance with and in support of the finance manager's responsibilities. In effect, the finance manager is responsible for the overall financial management of the assigned program area(s). One finance officer is responsible for the DOE cost centers and the other two are responsible for the WFO effort.

The accounting assistants provide support in a variety of ways:

- Supporting the DOE and WFO programs finance officers.
- Coordinating and accumulating information received from individual finance officers.
- Preparing monthly reports.
- Maintaining the procurement authorization (Form 1127) and subcontracts data bases and filing system.
- Providing other services as appropriate.

4.2.4 Significant Accomplishments During FY 1990

In meeting its objective, the finance section initiated a variety of efforts during FY 1990. Accomplishments during FY 1990 include the following:

- Initiated the "Financial Applications in the HAZWRAP Environment" training series as a means of communicating to program managers, project managers, project administrators, and others varying means of becoming more effective in their financial responsibilities. A total of 26 people received 350 person-hours of training in this effort.
- Brought the Division's WFO monthly report (Blue Book) more in line with Energy Systems invoicing through the

implementation of the recommendations of a PIP team. A report that identifies differences between the monthly report values and the Billing Work Order values (typically is synonymous to the invoice) grew out of this overall effort. The finance section reviewed this report each month to understand the nature of discrepancies.

- Updated the account master to include account budgets and the consequential development of a report with data grouped by project manager that reflect the current budgets, cost, and open/close status associated with each of their accounts.
- Brought more formality and structure to the FRG. This resulted in members of the FRG becoming more knowledgeable about and sensitive to the implication of cost incurred to the cost centers on the Division's standard labor rate. Efforts on the part of this group resulted in ending the fiscal year with an actual labor rate that was basically in line with the standard rate applied during the year.
- Developed a process to monitor funding expiration dates and to ensure extensions are obtained as appropriate. Through this process, over 200 documents scheduled to expire September 30, 1990, were successfully handled.
- Developed a report that lists all accounts that remain open against closed billing work orders. This situation contributed to the discrepancies between the monthly report and invoices.
- Made a conscious effort to spend the oldest increments of uncosted funds associated with ongoing projects. Practices are being put in place that will take a preventive rather than an exceptions approach.
- Initiated group meetings within the finance section to serve as a forum for two-way communication on current issues and for open discussions of financial issues that need attention.
- Improved HAZWRAP's commitment records through an effort to bring the Division's subcontracts data base in line with the actual subcontract or supplemental agreement used.
- Used work teams to review areas needing attention. These teams are expected to make recommendations as to the most effective means of dealing with the issues being addressed.
- Employed advanced planning to bring about a smooth year-end closeout process.
- Focused more attention on communicating to sponsors the desire to have amendments or references on follow-on funding documents for incrementally funded projects. Eighty-five percent of the funding documents received in September for incrementally funded projects used the amendment or reference approach. Continued effort in this area could result in 50 to 75% reduction in the Division's control points and accounts.
- Reduced erroneous charges and account overruns by approximately 30%.

4.2.5 Expected Near-Term Activities

The finance section expects to continually improve its mode of operations. During FY 1991, emphasis will be placed in the following areas:

- The Division uses a significant amount of 8(a) contract support that must be distributed to final cost objectives based on labor. One of the finance officers will be charged with the responsibility to consider all possible options and to recommend a more effective means of making this distribution.
- The section will initiate communication with both the procurement and accounts payable organizations that is intended to bring the Materials Management System records in line with the official work order data base system and HAZWRAP's records.

- Up until now budget and accounting (B&A) change documents have been centrally prepared. The section agrees that greater accuracy can be achieved and time saved if the B&A changes are prepared by the finance officer. A request for the Division's programmer to develop a program on the LAN for this purpose was requested by the finance section last fiscal year and is expected to be completed in the first quarter of FY 1991. Properly designed, this data base could serve as a means of communicating to project managers a summary of all requests for cost transfers made during a specific month.

- Currently, DOE does not allow the deobligation of uncosted funding associated with completed projects until a closeout audit has been done. These audits are running 4 to 6 years in arrears. HAZWRAP should expect to begin receiving a significant quantity of invoices for audited overhead rate adjustments applicable to subcontract costs incurred over the past 4 to 6 years. Particular attention will be directed toward obtaining an understanding from upper management and developing an acceptable means of managing this problem.

Training sessions on financial applications in the HAZWRAP environment helped project managers become more effective in their financial responsibilities.

4.3 SMALL, DISADVANTAGED BUSINESS PROGRAM

4.3.1 Scope of Activities

DOE awarded seven contracts to small disadvantaged businesses (SDBs), as defined by Sect. 8(a) of the Small Business Act, in the area of waste R&D primarily to support HAZWRAP. These 8(a) contracts may be accessed by other Energy Systems divisions and/or DOE to support their particular programs in the area of waste R&D. These contracts were not competitively bid and were awarded on a cost-plus-fixed-fee basis. New regulations were set forth by DOE effective October 1, 1989, which state that any 8(a) contract over $3 million must be competed. HAZWRAP's 8(a) contractors are listed in Table 4.

HAZWRAP was designated by DOE to administratively monitor all task orders for each of the seven 8(a) contractors from initiation to completion. This involves interfacing with both Energy Systems and DOE requestors, Energy Systems and DOE finance officers, DOE Contracting Specialist and Contracting Officers, DOE Contracting Officer's Representatives, Energy System's Site Coordinators, Energy Systems' Central Accounting, and the contractor's local Oak Ridge office managers.

HAZWRAP is responsible for ensuring that the task order process is being handled in an effective and efficient manner and that all reporting requirements have been met. HAZWRAP has designated an 8(a) Coordinator to (1) assist in the preparation and placement of task orders and task order revisions, (2) process and track contractor invoices, (3) maintain an accurate Energy Systems' work order and accounting data base, (4) monitor 8(a) contract modifications, and (5) prepare status reports.

The 8(a) reports are generated on a monthly basis to allow feedback on the validity of task order information, and a quarterly report is generated for all HAZWRAP senior managers and finance officers, Energy Systems' Central Accounting, Site Coordinators, and DOE Contracting Officers.

Figures 17-21 detail the growth of the 8(a) Program since its initiation in 1986 and depict the activity among the contractors for FY 1990.

4.3.2 Personnel

HAZWRAP has one full-time Energy Systems person monitoring the 8(a) task order process. A temporary person was recently added to facilitate the 8(a) task order process until a full-time Energy Systems person can be identified.

Table 4. HAZWRAP's 8(a) contractors

DOE waste management contractor	Contract No.
Advanced Sciences, Inc. (ASI)	DE-AC05-87OR21706
Automated Sciences Group, Inc. (ASG)	DE-AC05-86OR21642
Lee Wan & Associates, Inc. (LEEWAN)	DE-AC05-87OR21692
PAI Corporation (PAI)	DE-AC05-88OR21794
PEER Consultants, P.C. (PEER)	DE-AC05-87OR21705
Oak Ridge Research Institute, Inc. (ORRI)	DE-AC05-90OR21903
Science and Technology, Inc. (SCITEK)	DE-AC05-87OR21704

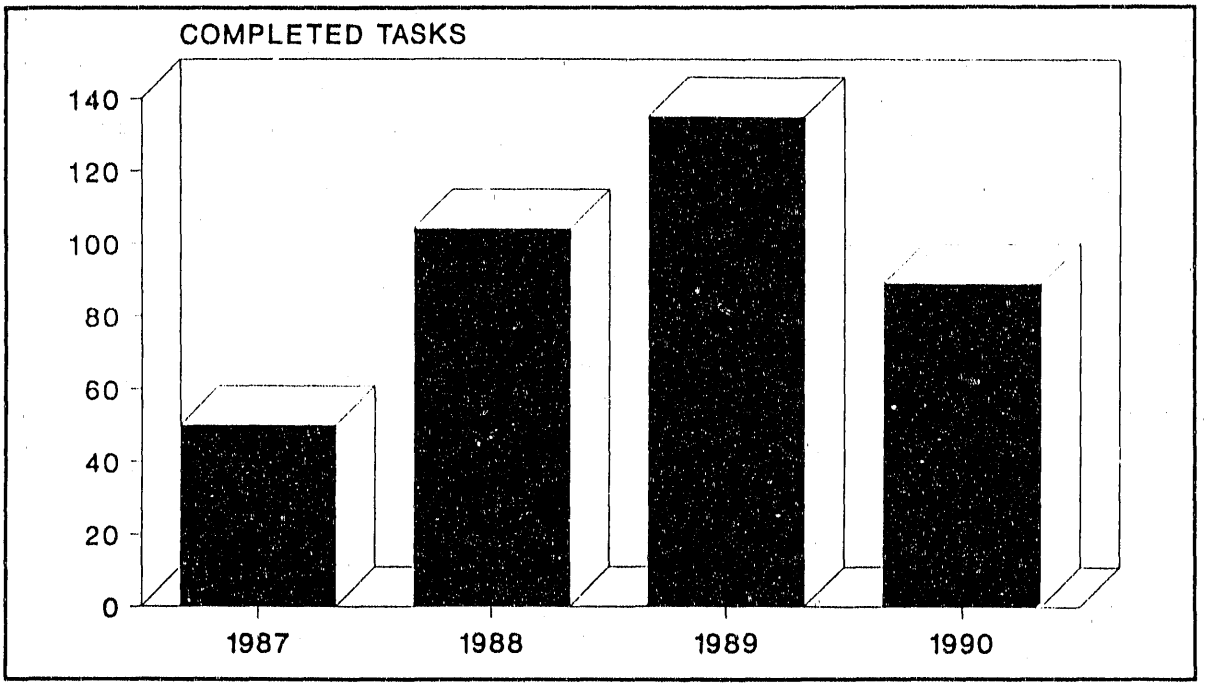


Fig. 17. HAZWRAP 8(a) contractor tasks completed by fiscal year.

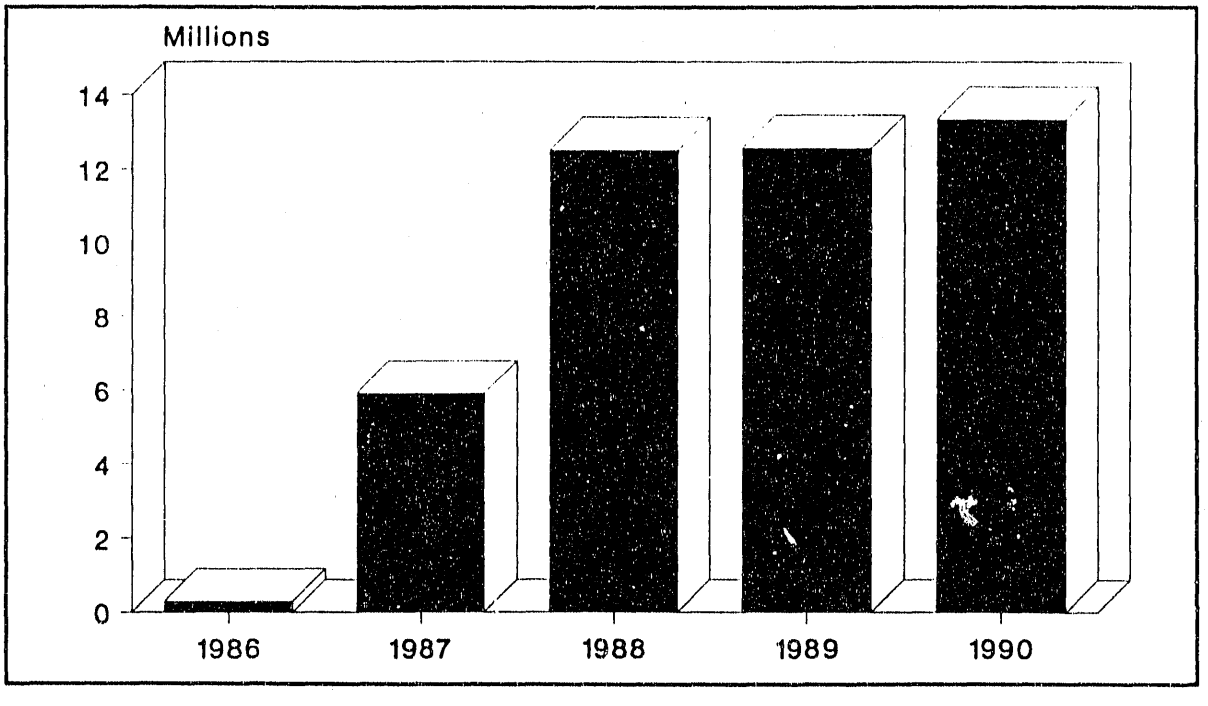


Fig. 18. HAZWRAP 8(a) contractor invoice cost by fiscal year.

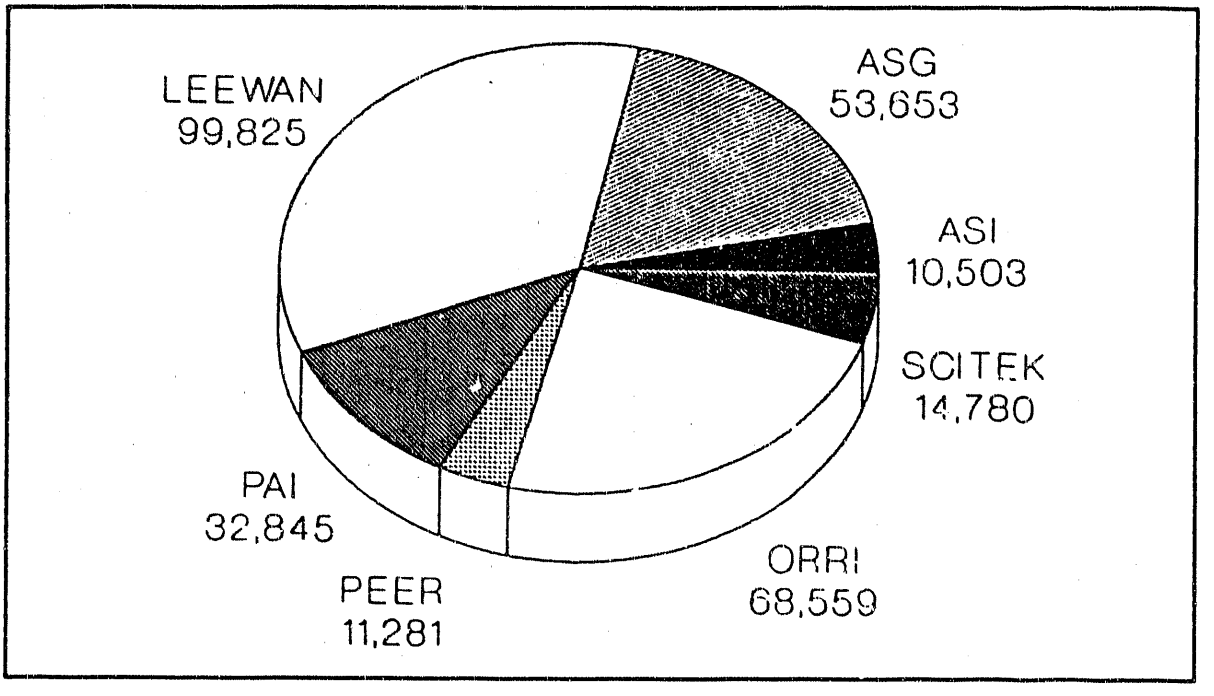


Fig. 19. HAZWRAP 8(a) contractor tasks initiated in FY 1990 (by hours).

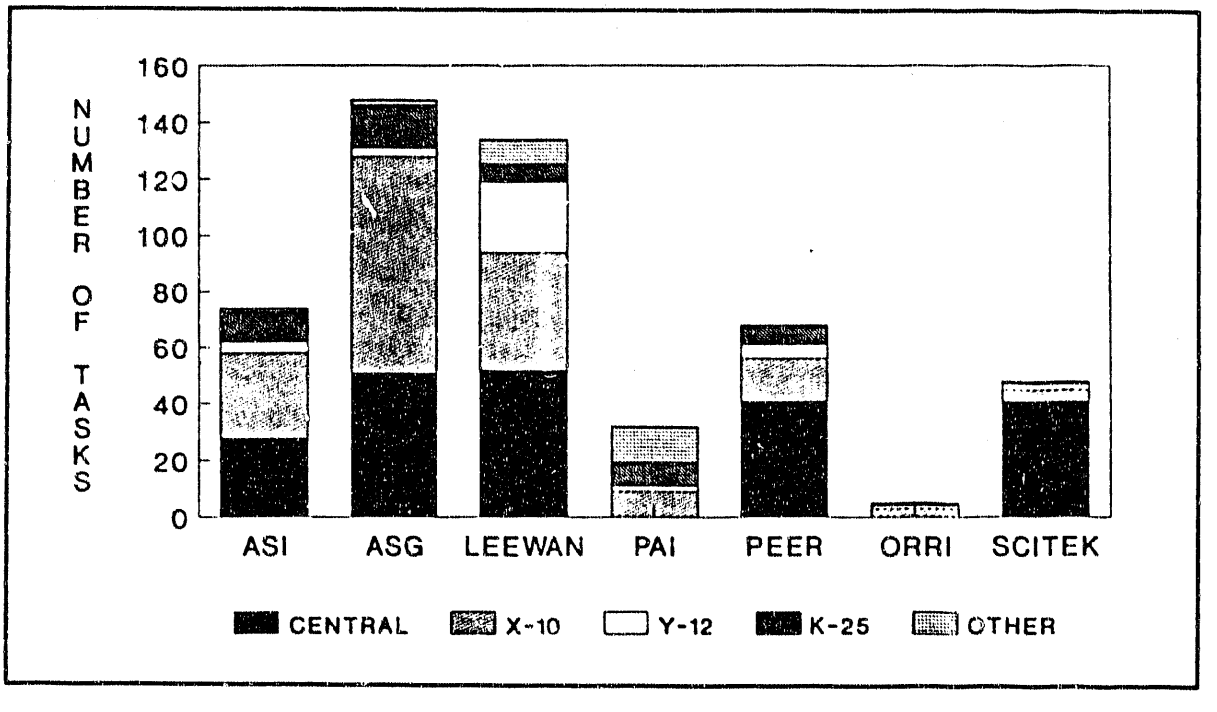


Fig. 20. HAZWRAP 8(a) contractors by site FY 1986-FY 1990.

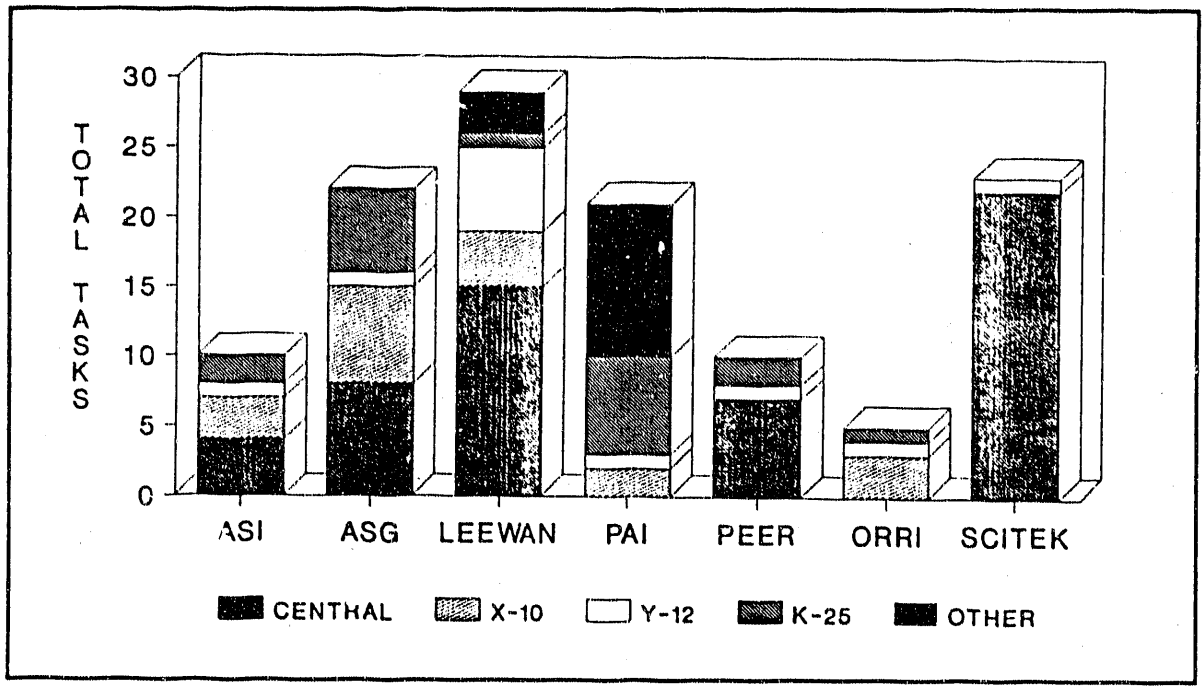


Fig. 21. HAZWRAP 8(a) contractor tasks initiated in FY 1990 (by site).

4.3.3 Significant Accomplishments During FY 1990

During FY 1990, the HAZWRAP 8(a) Program had considerable growth. The two most significant accomplishments were (1) the preparation of draft procedures for the tasking process and (2) the consolidation of the DOE and HAZWRAP 8(a) offices. These two accomplishments proved to be beneficial to the overall 8(a) task order process by increasing its accuracy and efficiency.

Other accomplishments also increased the effectiveness of the HAZWRAP 8(a) Program, including:

- continuously updated data base structures and task information,
- reorganized 8(a) contract filing system,
- consolidated DOE and Energy Systems's Contractor monthly reports,
- revised invoice procedures to ensure more effective payment to the contractor,
- revised 8(a) commitment procedures to contribute more effectively to Energy Systems' Central Accounting Commitment System,
- worked with contractors to reconcile task order records,
- initiated paperwork, with DOE and Energy Systems' finance officers' concurrence, to reduce overall 8(a) commitment and correct fiscal year financial plan funding allocations,
- monitored three contracts in support of ORAU, and
- computerized DOE Invoice Annex D attachment to ensure accuracy for invoice payment.

4.4 SAFETY

4.4.1 Scope of Activities

The Division safety officer is responsible for organizing the HAZWRAP Division Safety Committee; preparing the Division Safety Action Plan; preparing the Tri-County Building Emergency Plan and conducting emergency evacuation drills; conducting safety inspections, both OSHA-type and housekeeping; conducting Division Safety meetings; investigating off-the-job injuries; and conducting monthly motor vehicle inspections.

4.4.2 Personnel

The Division Safety Committee members are P. J. Franco (chair), H. F. Bauman, J. M. Johnson, H. D. Osucha, and J. L. Petty. The Division Health and Safety Officer is H. F. Bauman. The personnel assignments for the Division emergency organization are outlined in the Division Emergency Plan.

4.4.3 Significant Accomplishments During FY 1990

Safety Record. The Division completed FY 1990 with no lost day injuries or accidents requiring first aid. One off-the-job injury occurred in which an employee suffered a broken ankle while moving a picnic table. The results of the subsequent accident investigation were publicized at a Division safety meeting. No motor vehicle accidents involving the government vehicles assigned to the Division occurred. During FY 1990, 26,000 miles were driven while conducting business. The Division scored 97 (Outstanding) on the Safety Department review.

Safety Meetings. The Division conducted five formal safety meetings, which were held at the American Museum of Science and Energy. Individual departments assumed responsibility for organizing the safety programs, which included both on-the-job safety topics and off-the-job safety information. Division managers used these meetings to outline the various safety and award programs in place at Energy Systems.

Emergency Evacuation. As outlined in the Division Safety Action Plan, building evacuation drills were planned and conducted under the direction of the Division Safety Committee. The Oliver Springs Fire Department, as well as the K-25 Safety Department, participated in planning the drill. An accountability system was implemented to ensure that all building occupants were assembled following the drill. A critique was held to assess areas for improvement. Deficiencies noted in the audible alarm system were corrected. The fire alarm system was also upgraded, and additional smoke detectors and fire alarm horns were installed at the end of each major corridor in the building. Hand rails were installed on stairways at the outside emergency exits.

4.4.4 Expected Near-Term Activities

The Division will sponsor Red Cross Cardiopulmonary Resuscitation (CPR) classes to be held in the Division conference room. About 45 Division members have expressed interest in obtaining CPR certification.

The Safety Committee requested that the building fire alarm be provided with an automatic link to the local fire department. Plans are to install this link before the next emergency evacuation drill is conducted.

4.5 AFFIRMATIVE ACTION PROGRAM

HAZWRAP has been a strong proponent of the Affirmative Action/Equal Employment Opportunity (AA/EEO) program and, through its existence, has benefitted from the contributions of employees with diverse cultural, racial, and ethnic backgrounds, as well as those with physical handicaps.

HAZWRAP AA representatives were appointed by the Division Director to assist him and managers in developing, implementing, monitoring, and reporting AA/EEO program objectives.

4.5.1 Scope of Activities

Monthly meetings are held with the Division Director and Division AA representatives to address any AA concerns.

HAZWRAP conducts business with several 8(a) firms, including ORRI, ASG, PEER, Analysas, COR, Authorization Systems, LEEWAN, and ASI.

HAZWRAP has an existing intern program managed by The University of Tennessee and with HBCU/MEI. HAZWRAP targeted HBCU as a primary source of minority employees and sought to develop long-term relationships with these institutions that will facilitate recruiting. HAZWRAP is working with the ORO EEO Program Manager to set goals, identify opportunities, and develop strategies for implementing its EEO Program.

HAZWRAP employees are involved in several EEO Programs such as the Students Promoting Awareness of Races and Cultures (SPARC) Program, Focusing on Corporate Utilization Strategy, National Association for the Advancement of Colored People, and National Organization of Black Chemists Chemical Engineers and some hold civic offices in the community. Employees are encouraged to participate in Energy Systems' educational assistance program. HAZWRAP women and minorities continue to travel off-site, including foreign travel, to attend training courses and conferences and to interact with sponsors.

The change in status of female and minority employees from the end of FY 1989 to the end of FY 1990 is presented in the following table.

Personnel	1989	1990
Total Division	91	110
Female	27 (29.7%)	32 (29.1%)
Minority	6 (6.6%)	5 (4.5%)

4.5.2 Significant Accomplishments During FY 1990

The HAZWRAP AA/EEO Program was instrumental in providing input into the draft K-25 Development/Upward Mobility Plans Guidelines. HAZWRAP was the first division to complete plans for all minority employees; the plans were assessed during the FY 1990 Performance Planning Review process. The HAZWRAP AA/EEO Program had several positive accomplishments during the fiscal year, some of which follow:

- HAZWRAP Managers met with Energy Systems EEO Manager and K-25 AA/EEO Site Manager to discuss the Upward/Mobility Plans and other EEO issues.
- HAZWRAP has its first Goal Setting Program for FY 1991. This program sites underutilizations in certain areas in the Division.
- HAZWRAP is targeting HBCU as a primary hiring source of minority employees with capabilities to support waste management activities.
- HAZWRAP employees became more knowledgeable about the AA/EEO Program.
- HAZWRAP promoted 15 of 32 women employees.

4.5.3 Expected Near-Term Activities

With HAZWRAP implementing the HBCU/MEI Program, improvements in the Division's hiring of minorities should occur. This program involves publicity, lectures, visits, summer interns, and one-on-one interaction with qualified minorities who are capable of supporting waste management activities.

HAZWRAP has the Upward Mobility Plan in action. This plan includes employees taking courses, lectures, and seminars to improve their abilities and their chances for promotions. These plans enable the supervisor to be more knowledgeable of their employees' qualifications. There will be a 6-month review of the implementation of this plan.

4.6 HAZWRAP PUBLICATIONS OFFICE

4.6.1 Scope of Activities

The HAZWRAP Publications Office is responsible for ensuring the timely and cost-effective production of high-quality documents for HAZWRAP staff. The editors work closely with the technical staff and secretaries to determine editing needs and individual and group editing preferences. The editors are responsible for document production from initial editing to camera-ready copy and also oversee getting documents cleared and reproduced.

4.6.2 Personnel

Four full-time Publications Division editors, a part-time subcontract editor, and a HAZWRAP reports and data assistant support the HAZWRAP Publications Office. The Publications Division supplies temporary additional editorial support during peak production periods.

4.6.3 Significant Accomplishments During FY 1990

- With the support of HAZWRAP management, an editorial liaison program was initiated to ensure the continued timely and cost-effective production of high-quality documents. Because a specific editor is assigned to each Program, communication increased between the editors and the technical staff, and editorial consistency improved.
- The HAZWRAP Publications Office accepted an editorial intern from Tennessee Technological University for a 12-week assignment.
- HAZWRAP supported the Publications Division initiative involving two Oak Ridge High School students who were members of the SPARC Program. The students spent their 11-week internship in the Publications Office and the RAP Program.
- The HAZWRAP editors were responsible for editing the *DOE Research, Development, Demonstration, Testing, and Evaluation Plan* and the *DOE Environmental Restoration and Waste Management Five-Year Plan, FY 1992-1996* for DOE HQ. Each of the editors travelled to Gaithersburg, Maryland, to support this 8-month effort.
- The HAZWRAP editors received an award of "Distinguished" in the Society for Technical Communication's Annual Publications Competition for editing the first *DOE Environmental Restoration and Waste Management Five-Year Plan.*

5. TECHNICAL OPERATIONS AND QUALITY MANAGEMENT DEPARTMENT

5. TECHNICAL OPERATIONS AND QUALITY MANAGEMENT DEPARTMENT

The Technical Operations Department provides technical support to all HAZWRAP program areas. Five groups comprise the Department: engineering, hydrogeology, risk analysis, regulatory analysis, and QA. Each group has a chief, supporting staff, and supporting subcontractors. The functions of each group are described in this section.

In addition to direct project support, three major divisional initiatives are under way: total quality management, 8(a) contractor transition, and federal facility environmental restoration cost estimate modernization and standardization.

5.1 ENGINEERING

The engineering group is responsible for

- reviewing all design work accomplished within projects;
- developing or reviewing engineering cost estimates for all subcontracted efforts;
- providing project engineering support to projects in planning, scheduling, and cost and schedule control systems;
- providing Title III support during construction; and
- providing engineering support to the Administration Department in the form of office space specifications, floor plans, and maintenance.

The chief engineer is supported by three staff members, two of whom are subcontracted. Additional project-specific support is provided on an ad hoc basis through subcontracts with local firms and Energy Systems Central Engineering. Staffing plans for FY 1991 will add four environmental engineers to this staff as part of HAZWRAP's effort to reduce total costs to its customers by subcontracting a smaller portion of its support staff.

5.2 HYDROGEOLOGY

The hydrogeology group is responsible for

- reviewing all subcontractor proposals to do inspections, investigations, or studies;
- developing level of effort estimates for specific tasks in proposals;
- acting as technical liaison for the project manager in relations with sponsors and regulators;
- reviewing all preinvestigation deliverable documents from subcontractors;
- reviewing all investigation work in progress on sites;
- reviewing all postinvestigation deliverables; and
- providing support to DOE and Energy Systems sites on an ad hoc basis.

The chief hydrogeologist is supported by 24 staff members, 20 of whom are subcontracted. Additional support is provided as needed through manpower contracts with local firms. The four Energy Systems employees function as group leaders, supervising the work of subcontracted support in addition to completing specific technical assignments. Staffing plans for FY 1991 will add four hydrogeologists to provide adequate technical coverage for work in progress.

5.3 RISK ASSESSMENT

The risk assessment group is responsible for

- reviewing all subcontractor proposals to do inspections, investigations, or studies;
- supporting DOE efforts to develop a national risk assessment system;
- reviewing all preinvestigation deliverables from subcontractors;

- reviewing work in progress on sites;
- ensuring the quality, validity, and appropriateness of risk-based decisions; and
- supporting Energy Systems' efforts to develop a risk-based decision matrix.

The risk assessment group leader is supported by one subcontracted staff member. Staffing plans for FY 1991 will add two risk analysts to the staff. Additional support for specific risk analysis activities will be provided through competitively awarded task order contracts.

5.4 REGULATORY ANALYSIS

The regulatory analysis group is responsible for

- ensuring that all Division program activities are conducted in accordance with applicable regulations,
- providing analysis and interpretation of regulations to DOE and Energy Systems offices involved in environmental work,
- monitoring trends and directions in environmental law and providing Division management with timely updates, and
- maintaining a liaison with Energy Systems.

5.5 QUALITY ASSURANCE

The QA group is responsible for

- developing quality as the top priority item for everyone in the Division;
- working with the all departments and programs to implement the procedural infrastructure necessary to satisfy Energy Systems and DOE requirements;
- performing audits of projects, programs, subcontractors, and line functions; and
- developing, coordinating, and facilitating Total Quality Management (TQM) training, benchmarking, and rewards.

The QA functions are accomplished by personnel assigned to the Division from Central QA. The group leader and one support staff member provide Division-level support. Four additional Central QA personnel work within the programs to provide program-level support. Quality coordination at the program level and between programs and divisional quality requirements is accomplished through program-level meetings attended by the group leader.

5.6 NEW INITIATIVES

The Technical Operations and Quality Management Department developed several major initiatives during FY 1990.

Cost-Estimating Initiative. The engineering group provided support to DOE HQ in its development of a cost-estimating system for federal facility environmental restoration activities. Work to date includes participation in the development of the Cost Assessment Team Manual for HQ and a comprehensive survey of all government-funded, cost-estimating systems to determine their applicability to DOE needs. This work is being managed through the HAZWRAP ER Program. The engineering group is able to transfer cost experience and data gained through the WFO programs to related activities in DOE programs. Continued efforts in this area are expected to yield a DOE cost-estimating system that includes all of the strengths of other developing government systems and captures all relevant cost data from other government programs.

8(a) Contractor Transition Initiative. Some firms now covered by the 8(a) contracting provisions that were implemented to help SDBs grow are preparing to "graduate" from that program into the fully competitive contracting marketplace. To help bridge the gap between the old contracting mechanism and the new unprotected, competitive

mechanism, Technical Operations developed tasks in each of its technical areas that will be competitively awarded through an SDB set-aside procurement. The effect will be to provide continued technical support to HAZWRAP while continuing to support the larger objective of nurturing SDB growth into fully independent contractors.

Total Quality Management Initiative. Technical Operations stayed abreast of quality developments on a national scale. The Department believes that management to quality requirements will always result in lower costs and shorter schedules than any other management standard can deliver. Further, Department staff believe three ingredients are essential in any quality program: people involvement, a prevailing attitude of trust, and clearly communicated needs throughout the organization. Accordingly, staff initiated HAZWRAP's TQM program in a way that will develop each of the three key ingredients.

Staff visited other companies to learn "people involvement" techniques in white-collar applications. The Department will establish its first formal employee involvement team in January 1991. The team structure will be modeled after a hybrid combination of the best ideas seen in practice at the Harris Corporation and Martin Marietta Missile Systems. HAZWRAP will continue to measure its performance in customer satisfaction against the best service industries identified. Approximately 30% of the staff will be trained in the coming year in team activities, statistics, team problem solving, and other TQM tools.

HAZWRAP management will continue to improve its current effort to develop trust and employee empowerment in the coming year. HAZWRAP currently has an open meeting each Tuesday that serves as a forum for discussion of any facet of TQM. Videotapes on specific topics such as team building, values, and ethics are dispersed throughout the sessions to stimulate thought and conversation. Attendance varies but typically includes secretaries, project and program managers, the Division Director, the Deputy Director, and subcontractors. Two rules bound the discussions: every idea is important and, in this meeting, all are equal.

The Division continues to move toward more clearly communicated requirements by developing a hierarchy of policies and procedures. The "Procedure on Procedures" was issued, and staff are now generating an upper tier of procedures that will essentially

HAZWRAP staff discussed Total Quality Management with experts such as Ed Hubbard (Colonel, U.S. Air Force retired).

reflect Division strategies. Division members will develop lower tiers of procedures and operating instructions through employee involvement teams, relying on those who do the work to tell how to do the work best. Many pieces of this tier of procedures and instructions are now in place in the RAP Program in the form of its "Office Instructions." These office instructions will be expanded to divisional instructions where appropriate, and new instructions will be added as the need becomes apparent. The complete infrastructure of required procedures and instructions will be in place at the end of FY 1991. HAZWRAP's continuous improvement activities and employee involvement teams will then continue to work on details of the procedure infrastructure to develop a better fit with what the Division does.

A unique feature of the HAZWRAP TQM model is the methodology for integration of QA requirements. Most QA program requirements specify the need for management system controls that are not related to the QA staff function, but instead are part of good management practices. Therefore, HAZWRAP will have very few "QA" procedures, only those specifically related to the functional QA organization, for example, auditing, nonconformance reporting, corrective action tracking, and trending. The remaining QA requirements will be fulfilled through the HAZWRAP project management and administrative procedures, thus maintaining the responsibility for quality in line management.

The HAZWRAP TQM Policy (Fig. 22) was developed at the working level and then approved by Division program management and, thus, had input from all levels.

HAZWRAP

HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM

TQM POLICY

Total Quality Management (TQM) is an approach that assimilates quality objectives, corporate values, performance goals, and continuous improvement projects into systematic business practices.

The Hazardous Waste Remedial Actions Program (HAZWRAP) is committed to TQM as a philosophy and as a system for achieving excellence in its activities, with the ultimate goal being complete customer satisfaction.

Elements of the HAZWRAP TQM Program are defined as follows:

- **Quality Objectives:** To implement a HAZWRAP Quality Assurance (QA) Program responsive to the needs of Martin Marietta Energy Systems, Inc. (Energy Systems), its sponsors, clients, and regulatory agencies;

- **Corporate Values:** To integrate Energy Systems values and the Martin Marietta Corporation Code of Ethics and Standards of Conduct into HAZWRAP policies and procedures;

- **Performance Goals:** To develop and implement a structured and disciplined program management system by which HAZWRAP conducts and controls its activities and measures its achievement of organizational objectives;

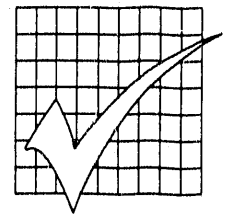
- **Continuous Improvement:** To implement the Performance Improvement Process (PIP) on a continuing basis which promotes teamwork and maximizes people involvement and empowerment in decision making. Continuous improvement also includes employee education and training to keep staff current with new or modified systems and procedures; and

- **Lessons Learned:** To implement a system to serve as a centralized resource for the exchange of experience across all programs to promote technology transfer. The system will provide a means of collecting, storing, and sharing knowledge and experience gained in the course of conducting projects.

Robert B. Craig
Director, HAZWRAP

Fig. 22. HAZWRAP Total Quality Management Policy.

6. TECHNICAL REVIEW GROUP



6. TECHNICAL REVIEW GROUP

The TRG was formed to provide independent and objective review of HAZWRAP's technical activities. The TRG is made up of recognized experts in areas relating to HAZWRAP's mission. Members have come from academia, industry, public interest groups, state government, and federal agencies other than DOE. Members are selected on the basis of personal qualification, appointed by the HAZWRAP Director and approved by ORO. The TRG provides a forum for technology exchange and program consultation between HAZWRAP and targeted governmental agencies, academia, industrial forums, not-for-profit organizations, professional communities, and other appropriate organizations. To this end, the TRG brings a broad interdisciplinary perspective to the review of HAZWRAP activities. The TRG provides objective independent reviews and evaluations of HAZWRAP's current technical plans, projects, and activities related to DOE's policies and actions to meet national goals and regulatory requirements and review and analysis of technology RDDT&E projects supporting hazardous waste management. On an ad hoc basis, the TRG may establish special working groups to address specific issues and may appoint specialists in disciplines not represented on the TRG to the working groups on a short-term basis. TRG membership is listed in Table 5.

Table 5. Membership of the Technical Review Group

Michael J. Carricato
Lockheed Engineering & Sciences Company
Washington, D.C.

Capt. Guy Everhart, USN
Defense Department ODASD(E)
Alexandria, Virginia

Dr. Michael Kavanaugh
James M. Montgomery Engineers
Walnut Creek, California

Dr. Joseph T. Ling
3-M Corporation (ret.)
St. Paul, Minnesota

Dr. Nicholas Matalas
U. S. Geological Survey
Reston, Virginia

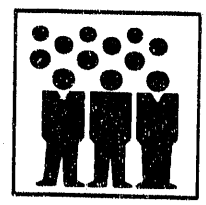
Dr. Philip A. Palmer
E. I. duPont and Company
Newark, Delaware

Dr. Frank Parker (Chairman)
Vanderbilt University
Nashville, Tennessee

Dr. Glenn Paulson
Illinois Institute of Technology
Chicago, Illinois

Dr. Donald Sanning
U. S. Environmental Protection Agency
Cincinnati, Ohio

7. HAZWRAP PERSONNEL



7. HAZWRAP PERSONNEL

As a management organization, HAZWRAP's greatest resource is its people. As of September 30, 1990, 110 people were employed at HAZWRAP, which is three times the number in the organization in 1987 (Fig. 23). This pattern of growth is reflected in the large number of Division employees with fewer than 10 years of company service (Table 6). An additional 30 persons from other Energy Systems organizations provide direct support to HAZWRAP (Table 7). These organizations include Procurement, Finance and Materials, Information Resources and Administration, and Instrumentation and Controls. The distribution of HAZWRAP personnel among the organizational units and programmatic areas is shown in Tables 8 and 9.

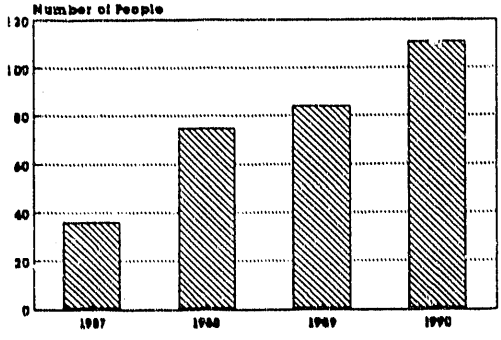


Fig. 23. Number of HAZWRAP personnel by fiscal year.

Eighty percent of HAZWRAP employees have college degrees, with one-half of these also having advanced degrees. As with any technical organization, these degrees are concentrated in engineering and the sciences (Table 10).

Table 6. HAZWRAP Division personnel by years of company service

Length of service	Number of employees	Percentage of Division personnel
More than 20 years	14	13
10 to 20 years	19	17
Less than 10 years	77	70

Table 7. HAZWRAP personnel by payroll

Personnel	Monthly	Weekly	Hourly	Total
HAZWRAP Division	88	22	0	110
Other Divisions	23	6	1	30
Total	111	28	1	140

Table 8. HAZWRAP personnel by function

Personnel	Monthly	Weekly	Total
Management	4	3	7
Program Staff	72	13	85
Administrative Operations	3	5	8
Technical Operations	9	1	10
Total	88	22	110

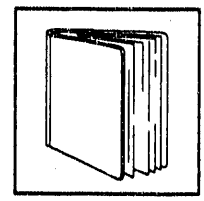
Table 9. HAZWRAP staff by program

Program	Monthly	Weekly	Total
Environmental Restoration	39	8	47
Waste Technology	14	1	15
Waste Information	3	2	5
Pollution Prevention	7	1	8
Environmental Hazards	9	1	10
Total	72	13	85

Table 10. HAZWRAP personnel by education level

Degree	Field of Study			
	Engineering	Science	Other	Total
PhD	0	7	0	7
MA/MS	11	23	3	37
BA/BS	25	9	10	44
None			22	22
Total				110

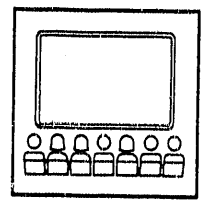
8. HAZWRAP PUBLICATIONS DURING 1990



8. HAZWRAP PUBLICATIONS DURING 1990

DOE/HWP-65/R1	Requirements for Quality Control of Analytical Data
DOE/HWP-69/R1	Requirements for Quality Control of Field Sampling
DOE/HWP-93	Minutes from DOE/HAZWRAP Research and Development Technical Needs Assessment Review Meeting September 1989
DOE/HWP-94	Navy Radon Assessment and Mitigation Program Progress Report for the Period September 1988 to May 1989
DOE/HWP-95	Proceedings of the U.S. Department of Energy Office of Defense Programs Waste Reduction Workshop III
DOE/HWP-96	Some Statistical Sampling Considerations for the Navy Radon Assessment and Mitigation Program (NAVRAMP)
DOE/HWP-97	Proceedings of U.S. Department of Energy Waste Information Network (WIN) Environmental Restoration and Waste Management Waste Reduction Workshop IV
DOE/HWP-100	Standard Operating Procedures for Site Characterization
DOE/HWP-102	Hazardous Waste Remedial Actions Program Annual Progress Report for the Period Ending September 30, 1989
DOE/HWP-104	Proceedings of the U.S. Department of Energy Office of Environmental Restoration and Waste Management Waste Reduction Workshop V

9. WORKSHOPS AND SYMPOSIA ORGANIZED BY HAZWRAP STAFF



9. WORKSHOPS AND SYMPOSIA ORGANIZED BY HAZWRAP STAFF

One of the continuing missions of HAZWRAP support to its sponsors is to maintain communications among those interested in developing technologies and management strategies. In accomplishing this, HAZWRAP sponsored several information exchange meetings in FY 1990. HAZWRAP staff also served on program organizing committees, served as session chairs, or provided other support for major waste management conferences and meetings, including the Oak Ridge National Laboratory Life Sciences Symposium and the American Society for Quality Control "Environmental Protection" session. Each workshop is summarized below.

Asbestos Development and Demonstration Initiatives Work Group - Quarterly

This work group met to discuss asbestos management, health and safety, and asbestos disposal issues. Representatives from the Army, Air Force, Navy, General Services Administration, Federal Aviation Administration, and the State Department were regular attendees. Meeting minutes were produced and distributed to the attendees.

Environmental Restoration Program Managers' Meeting - Quarterly

These meetings were held to coordinate information among the various sites on ER activities. The meetings focused on DOE HQ News and Views, Lessons Learned on Tri-Party Agreements, Status of Ongoing Negotiations and Executed Agreements, Land Disposal Restriction: ER Impact, NEPA requirements related to ER and Site Applications, RDDT&E Plan: Status and ER Needs Identification, Program Management Plan Update, Five-Year Plan Implementation, Programmatic EIS, and Data Base and Information Systems Status. Minutes were published and distributed to the attendees.

DOE/Air Force Joint Technology Review Meeting - February 6-8, 1990

This workshop focused on various technologies sponsored by the Air Force and/or DOE. The technologies presented were separated into one of two groups, depending on their development status. Technologies in the R&D stage were grouped in "Emerging Technologies." Technologies being demonstrated were included in "Field Demonstrations." Topics included bioremediation, chemical/physical remediation, characterization and monitoring, and waste minimization. The workshop was attended by approximately 70 people from various Air Force installations and DOE sites. A summary of each technology presented was provided by the presenter and compiled into a proceedings for each attendee. In addition, approximately 30 additional copies of the proceedings were sent to individuals requesting them.

DOE Waste Reduction Workshop IV - February 6-7, 1990

This workshop was the fourth in a series of waste minimization/reduction workshops held under the auspices of EM. The workshop provided a forum for waste minimization/reduction planning, including waste minimization assessments. EPA was invited to participate and provided sessions on its Pollution Prevention Program, Pollution Prevention Assessments, and Pollution Prevention Planning. Other sessions included Process Waste Assessment Methodology, Baseline for Success Demonstration, Guidance on Waste Minimization Planning, and the DOE Agency Pollution Prevention Program. A roundtable discussion was held on the

progress and status of waste minimization planning and effectiveness of the workshops. The proceedings were published and distributed.

Stakeholders' Forum - April 2-4, 1990

More than 40 participants from federal agencies, states, Indian nations, industry, labor, academia, and environmental and public interest organizations invited by HQ met to learn about and discuss the draft revision of the Five-Year Plan. The purpose of the meeting was to provide input; no effort was made to reach agreement on specific advice for DOE. Discussions centered on such topics as setting goals for ER and waste management, changing the way programs are carried out, providing means for reaching the goals, and developing documents to establish goals and evaluate progress. A summary of the meeting was published.

DOE Environmental Biotechnology Workshop - April 10-11, 1990

The purpose of this workshop was to review the state-of-the-art in biotechnology under development in the DOE complex and to develop a prioritized list of biotechnologies based on the potential restrictions and limitations that may be encountered during their development. Work groups were formed to discuss issues in (1) treatment of wastes and remediation of environments containing inorganics (metals, semimetals, actinides, and nitrates), (2) treatment of organics in surface reactors, and (3) treatment of organics in situ. Biotechnologies were identified as those currently available or available in the near term and those requiring a longer time for development. A summary of the findings of the work groups was developed and sent to DOE HQ and all attendees.

DOE Real-Time Subsurface Monitoring of Groundwater - April 17-18, 1990

This workshop served as a follow-up to a workshop held on In Situ Monitoring in June 1988. While the previous workshop emphasized in situ monitoring in soils and groundwater, this workshop focused on real-time groundwater monitoring. Technologies included fiber-optic sensors, underground imaging, ion mass spectrometers, penetrometers, and lasers. Participation included DOE laboratories, U.S. Army Toxic and Hazardous Materials Agency, AFESC, private industry, and universities. Summaries of the technologies were provided by the presenters and compiled into a proceedings.

DOE Waste Reduction Workshop V - July 24-26, 1990

The fifth of a series of waste minimization/reduction workshops was held under the auspices of EM. Waste minimization plans from each site were reviewed at DOE HQ, and general comments were discussed at this workshop. Other sessions were held on goal setting, reporting requirements, data base systems, bar coding, the EPA Pollution Prevention Information Clearinghouse, recycling activities, and process waste assessments. The proceedings were published and distributed to the attendees.

DOE Thermal Treatment of Soil/In Situ Vitrification - August 8-9, 1990

ER activities will potentially be the largest generator of waste in the DOE complex. Thermal treatment technologies for contaminated soils are under development in private industry and at the DOE laboratories to minimize this volume. This workshop discussed the development of the processing of soils contaminated with volatile organic

compounds and explosives, low-temperature thermal separation of soils contaminated with mixed wastes, supercritical water oxidation, steam injection, plasma treatment, and in situ vitrification. A tour of the in situ vitrification facilities at the Hanford facility was provided. Summaries of the technologies were provided by the presenters and compiled into a proceedings.

10. PERFORMANCE IMPROVEMENT PROCESS PROJECTS

10. PERFORMANCE IMPROVEMENT PROCESS PROJECTS

PIP is a structured process by which teams of individuals cooperate to find a solution to a problem within a system with the endorsement of management. In endorsing the team effort, management assumes the responsibility for recognizing and seriously evaluating the recommendations of the team. FY 1990 was the first full year of PIP activities being coordinated in HAZWRAP. It was an active year. Three significant PIP projects were initiated.

The first PIP committee reviewed the current uses and requirements and evaluated the potential uses of a HAZWRAP Project Budget Plan the (PBP) as a planning tool within HAZWRAP. The team was chartered to formulate a set of recommendations describing how the PBP can be changed, improved, or supplemented to increase its usefulness for all levels of management. The team was composed of project managers who were interested in creating a PBP that "worked" for them. A substantial set of recommendations resulted from the PIP that are being evaluated by upper management within HAZWRAP.

The second PIP was initiated to develop and implement a prototype for an office waste recycling program within the Division Fig. 24).

The HAZWRAP Publications Office, which leads this effort, proposed to reduce the amount of waste paper, aluminum, glass, and plastic used in the office environment by recycling and substitution. A prototype of a waste paper recycling system is currently being used throughout the Division as a result of these PIP efforts.

The third PIP project was initiated in HAZWRAP, but was Energy Systems-wide in its nature. The Asbestos Management in Energy Systems PIP focused on the need to develop the best strategy to deal with the long- and short-term management of, as well as the engineering and technical challenges created by, asbestos-containing building materials in all five Energy Systems facilities. The team included representatives from each of the facilities. This PIP project is in its early implementation phase.

Besides these formal PIP efforts, HAZWRAP embarked on continuous improvement as a theme of TQM with employee involvement teams as a key element. From these teams, it is expected that cost savings and efficiency improvement opportunities will be identified that will create a more effective HAZWRAP.

Fig. 24. Members of the recycling Performance Improvement Process project team.

APPENDIX A. INTERAGENCY AGREEMENTS

APPENDIX A. INTERAGENCY AGREEMENTS

Project number	Title	Sponsor agency
0286-C087-A1	Environmental Support	Food and Drug Administration
1489-1489-A1	Environmental Support	Air Force Engineering and Services Center
1489-B023-A1	Asbestos Management	Air Force Engineering and Services Center
1612-A103-A1	Panama Treaty Implementation	U.S. Army Southern Command
1651-1317-A1	Environmental Support	Naval Sea Systems
1660-1812-A1	Environmental Support	Air Force Military Airlift Command
1758-1758-A1	Environmental Support	Air Force Strategic Air Command
1759-1759-A1	Environmental Support	Naval Energy and Environmental Support Activity
1762-1762-A1	Environmental Support	Air Force Engineering and Services Directorate
1763-1763-A1	Environmental Support	Air Force Tactical Air Command
1769-1769-A1	Environmental Support	U.S. Army Toxic and Hazardous Materials Agency
1769-A003-A1	Environmental Support	U.S. Army - Rocky Mountain Arsenal
1792-1781-A1	Environmental Support	Air Force Systems Command

Project number	Title	Sponsor agency
1789-1789-A1	Environmental Support	Air Force Air Training Command
1816-1760-A1	Environmental Support	Air Force Logistics Command
1824-1526-A1	Hazardous Waste Control Technology Data Base	Environmental Protection Agency
1824-B087-A1	Waste Engineering Research Laboratory	Environmental Protection Agency
1828-1791-A1	Environmental Support	Naval Facilities Engineering Command
1889-B148-A1	Environmental Support	Department of State
1896-D056-A1	Environmental Support	Army Strategic Defense Command
1910-A117-A1	Environmental Support	Air Force Space Command
1958-C014-A1	Environmental Support	U.S. Army Toxic and Hazardous Materials Agency
1989-C110-A1	Environmental Support	U.S. Army-Rocky Mountain Arsenal
1992-C059-A1	Environmental Support	U.S. Forest Service

APPENDIX B. CONSULTANTS AND SUBCONTRACTORS

APPENDIX B. CONSULTANTS AND SUBCONTRACTORS

FY 1989 REMEDIAL ACTIONS GENERAL ORDER SUBCONTRACTORS

Camp, Dresser, and McKee
CH2M HILL
Dames & Moore
Ebasco Services, Inc.
Engineering-Science, Inc.
E. C. Jordan (ABB Environmental)
International Technology Corporation
Metcalf & Eddy
NUS Corporation
Science Applications International Corporation
The Earth Technology Corporation

FY 1986 REMEDIAL ACTIONS GENERAL ORDER SUBCONTRACTORS

CH2M HILL
Dames & Moore
E. C. Jordan
Engineering-Science, Inc.
International Technology Corporation
NUS Corporation
Science Applications International Corporation
URS Corporation

FY 1989 AIRBORNE HAZARDOUS SUBSTANCES GENERAL ORDER SUBCONTRACTORS

Battelle Memorial Institute
Bechtel Environmental, Inc.
Ecology & Environment
ERC Environmental & Energy Services Company
International Technology Corporation
NUS Corporation
Roy F. Weston, Inc.
Science Applications International Corporation
Sirrine Environmental Consultants

OTHER SUBCONTRACTORS

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BDM Corporation
Benchmark Surveying and Engineering
Center for Strategic & International Studies

CER Corporation
Computrac
Digital Equipment Corporation
Environmental Resource Center
Evaluation Research Corporation
Greystone Development Consultants, Inc.
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NFT International
Oak Ridge Associated Universities
Performance Development Corporation
Pine Crest Corporation
Quadrell Services, Inc.
Research Triangle Institute
Scientech
The Earth Technology Corporation
The Maxima Corporation
The University of Tennessee
University of Nevada, Las Vegas, Desert Research Institute
Virginia Polytechnic Institute

DOE 8(a) CONTRACTORS

Advanced Sciences, Inc.
Analysas Corporation
Authorization Systems, Inc.
Automated Sciences Group, Inc.
COR, Inc.
Cosmos
Lee Wan and Associates, Inc.
PAI Corporation
Oak Ridge Research Institute
PEER Consultants, P.C.
Science and Technology, Inc.
Summitec, Inc.
World Computer Systems Services Associates, Inc.

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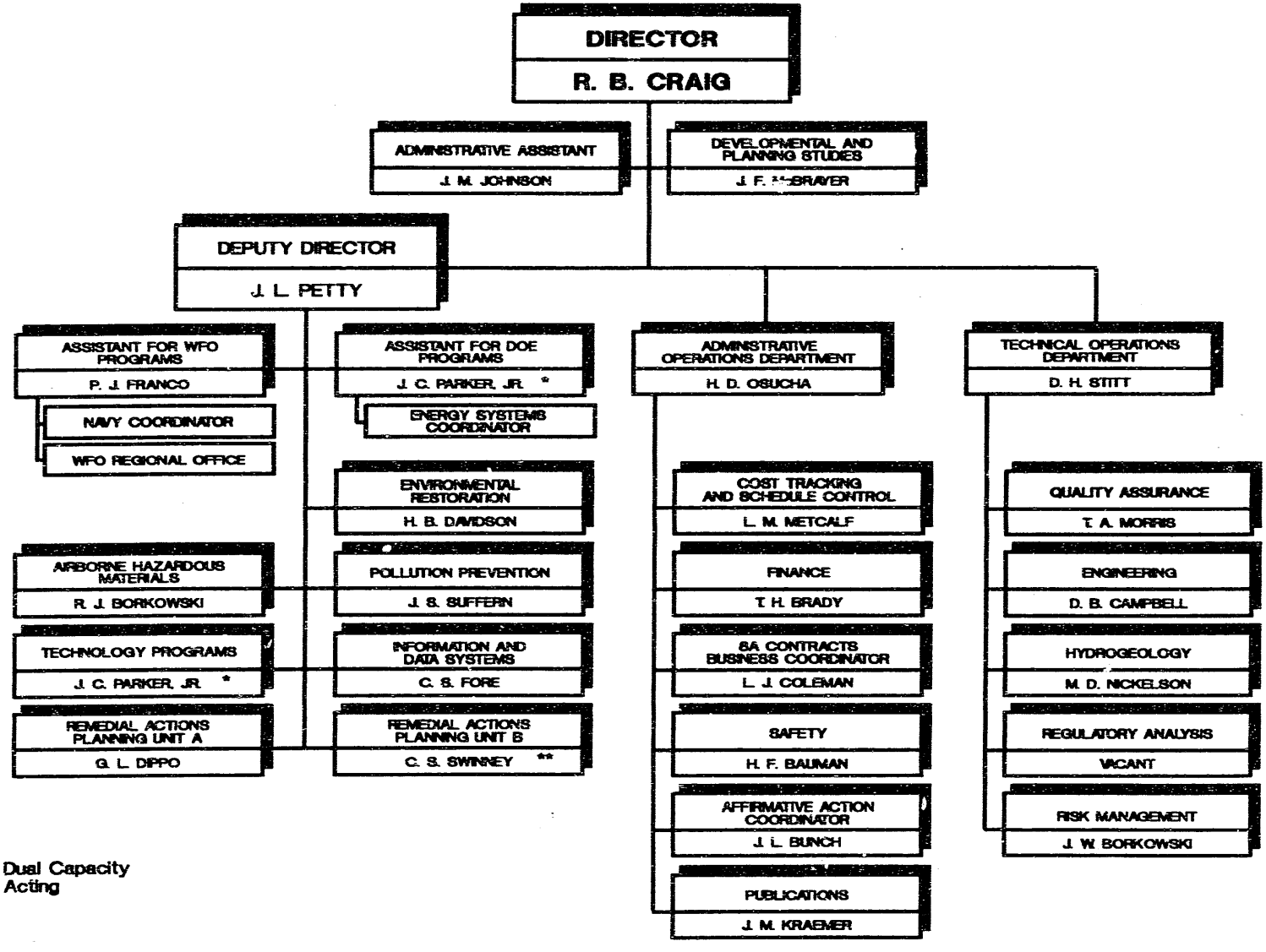
APPENDIX C. HAZWRAP ORGANIZATION CHART

HAZWRAP DIVISION
SEPTEMBER 1990



* Dual Capacity
** Acting

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