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Report to the Secretary of Energy

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DEPARTMENT OF ENERGY

Management Problems Require a Long-Term Commitment to Change

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Resources, Community, and
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The Honorable Hazel R. O'Leary
The Secretary of Energy

Dear Madam Secretary:

The Department of Energy (DOE) that you have inherited faces an extraordinary array of policy and management challenges unprecedented in its 16-year history. DOE's original missions—to develop, build, and maintain the nation's nuclear arsenal—are changing rapidly with the decline of the U.S.-Soviet nuclear arms race, while basic and applied science and environmental cleanup are emerging as the Department's principal concerns. At the same time, DOE's top and mid-level management is under severe stress because of widespread criticism that it has neglected environmental, safety, and health (ES&H) issues throughout the Department's vast network of production and research facilities.

An underlying problem for DOE is its reliance on 149,000 contract employees to conduct its work. DOE's reliance on contractors, and the difficulties that reliance creates, raise key questions about the future direction of the Department's management. This report assesses the changes DOE has made over the last several years to address criticisms of departmental management and recommends taking action to remove barriers that are preventing change from taking hold.

This is the first of several reports we will issue on DOE; it is part of a series of GAO General Management Reviews of federal departments and agencies. Our purpose in conducting these reviews is to assess each department's or agency's management and identify actions that can improve organizational performance. This report is primarily based on 174 in-depth interviews of senior managers in DOE headquarters, field offices, and laboratories.

Results in Brief

DOE has been criticized by the Congress and others for failing to properly manage and maintain its vast nuclear weapons production complex and for allowing contractors to dominate the Department's activities while eluding management and financial oversight. DOE has acknowledged these management weaknesses and, to its credit, has confronted problems by launching a broad range of initiatives over the last several years. However, the management challenges facing DOE are so significant that fundamental changes will come slowly. Strong leadership is needed to sustain the

momentum created by the progress already achieved and to build an effective management structure for the future.

Two of the most important management changes made were DOE's reorganization to instill accountability, and reforms in procurement practices to improve oversight of private contractors' behavior. These are important steps, but fundamental DOE weaknesses are preventing changes from working. For example, confusion and uncertainty surrounded the reorganization that was begun by your predecessor in 1989, largely because of continuing communication problems that hamper relationships between DOE headquarters and its 10 field offices. Efforts to strengthen oversight are severely compromised by work force weaknesses, such as limitations in technical and administrative skills, and by the failure of management systems to provide information for monitoring and evaluating contractors' behavior.

Aggressive action to overcome these barriers is especially important as incoming DOE leadership develops additional initiatives to address continuing problems in organizational structure and contract management.

Background

Created in 1977 from a number of diverse agencies, DOE manages the nation's nuclear weapons production complex and conducts research and development on both energy and basic science. The Department has evolved from an enterprise that dealt predominantly with the "energy crisis" of the 1970s to an agency that was proposed for abolition in the 1980s, then to one that was pressed to its physical and managerial limits to produce nuclear weapons.

DOE operates an elaborate network of facilities engaged in research and nuclear weapons production. The bulk of these facilities constitute the nuclear weapons complex—a collection of 17 major facilities in 13 states that design, develop, test, produce, and now dismantle the nation's nuclear arsenal. About half of DOE's resources are devoted to the complex, an allocation that reflects the buildup of nuclear weapons in the 1980s and, more recently, the rapidly escalating cost of waste management and environmental restoration. DOE also maintains the nation's largest science laboratory network and sponsors a wide variety of applied and basic research on energy issues. To perform its many missions, DOE was authorized to spend more than $20 billion in fiscal year 1993.

An unusual feature of DOE's management is its extensive reliance on contractors, a legacy from the wartime "Manhattan Project," which designed and built the world's first atomic bombs. Continuing this practice, the postwar Atomic Energy Commission (AEC) gave contractors that managed and operated federal facilities wide leeway in their activities, under a philosophy of "least interference." Moreover, in the culture of extreme secrecy about national security that characterized the federal nuclear enterprise from its inception, contractors were further insulated from external scrutiny and, until the 1980s, from most federal and state environmental laws.

DOE Has Significant Management Problems

Widespread criticism of DOE and its contractors began to surface in the mid-1980s, through reviews and press accounts of serious environmental contamination and neglected maintenance throughout the weapons complex. GAO, the Congress, and other outside groups, as well as internal DOE reviews, have reported extensively on DOE's management weaknesses. As the underlying causes of DOE's problems became apparent, the Department acknowledged shortcomings and undertook several reforms. The previous Secretary's summation of the Department's condition cited

- management neglect, unsafe procedures, and noncompliance with environmental laws throughout DOE's facilities and field offices;
- no control, accountability, or effective oversight in line management; and
- unsatisfactory contract and financial management.

These conditions have raised questions about the ability of DOE to properly manage its contractors and its continuing use of a decentralized management philosophy dating from the Manhattan Project and the AEC. DOE's past near-total reliance on contractors working with minimal government oversight and accountability has led to the conditions that past and current leadership seeks to correct. Past weapons production priorities created a climate in which ES&H issues were given little funding or attention by DOE until problems became extremely serious.

Management Weaknesses Addressed by Reorganizing and Strengthening Contract Management

To reverse these conditions, DOE has launched many initiatives over the last several years. Two of the most important management changes made by the previous administration were

- reorganizing in 1989 to establish stronger headquarters accountability over policies and programs, and
- reforming contract management policies and practices in order to improve contractors' behavior.

In reorganizing, DOE sought primarily to give assistant secretaries direct authority over field offices, which had long operated independently of program managers at headquarters. The changes required field managers to report directly to an assistant secretary responsible for a major program area. "Excessive" field autonomy for managing contractors, established over 40 years, was viewed by the previous Secretary as a major cause of the management weaknesses prevalent throughout the Department. In June 1993, DOE further modified its reporting approach by having field office managers report to a new headquarters office headed by the Associate Deputy Secretary for Field Management. This change represents a significant departure from the previous administration's approach of having a direct line of accountability between assistant secretaries and field offices.

Changes in contract management were made to hold contractors more accountable for performance improvement. These changes included requiring contractors to assume more liability for improper performance and rewriting contracts to include detailed tasks. Incoming leadership has announced that additional contract management improvements are forthcoming, including the creation of a task force charged with reforming contract management.

We support DOE's continuing efforts to address management problems, having previously reported on the Department's need for both organizational and contract management change.[1]

[1]A New Headquarters/Field Structure Could Provide a Better Framework for Improving Department of Energy Operations (GAO/EMD-81-97, Sept. 3, 1981) and Department of Energy Contract Management (GAO/HR-93-09, Dec. 1992).

Significant Obstacles Prevented Past Management Changes From Working

We found that managers throughout DOE generally support the need for changes, but many basic barriers threaten success. Serious communication and coordination problems prevented the 1989 reorganization from working properly, causing prolonged confusion over roles and responsibilities in various units. Work force weaknesses, including a shortage of technical and administrative skills and inadequate management support systems, still impede DOE's ability to properly administer contract management changes. Addressing these fundamental problems will require attention as new leadership develops its own management initiatives.

Serious Communication and Coordination Problems Complicate DOE's Reorganization Attempts

Although the 1989 reorganization established direct program control from headquarters to field offices, the implementation of changes led to confusion and frustration among field office managers. New lines of authority under the reorganization were complex and sometimes confusing. For example:

- DOE's three weapons laboratories reported to the Assistant Secretary for Defense Programs, in chains of command through two separate field offices. But one of these field offices also reported to the Director for Energy Research. Similarly, one contractor operates two of the three laboratories, yet had to be simultaneously responsive to two field offices because they reported to different assistant secretaries. These complicated reporting channels confused field managers and made meeting priorities a challenging task.
- The Idaho National Engineering Laboratory (INEL) and the Oak Ridge field offices reported to the Assistant Secretary for Nuclear Energy, yet most of their work is for other assistant secretaries. Field offices generally reported directly to assistant secretaries with the largest program presence in the field offices' facilities. INEL also performs work for eight different assistant secretaries, a situation that requires extensive internal coordination. Formal arrangements for funding and overseeing facility infrastructure (utilities, roads, safety, and security) among different assistant secretaries were only established in late 1992.

DOE's finance managers in the field report simultaneously both to their field office managers and to the Department's Chief Financial Officer (CFO). This dual reporting creates potential conflicts in priorities at both the field and headquarters levels. Nevertheless, we support the concept of increased financial accountability at the field level.

According to over 90 percent of the 114 senior DOE managers we interviewed, organizational lines of authority and responsibilities need to be clarified. (We did not ask the 60 laboratory managers this question.) Over half told us that organizational clarifications are "greatly" needed. The lack of clarification was expressed by a field office manager in his 1992 report on management controls to the Secretary:

"What [the reorganization] fails to do is to provide the protocols and guidance essential to efficient and cost effective implementation of the work at hand . . . . [DOE's chain of command] in essence creates eight direct channels into one or more contractors for which there is a single contracting officer . . . . What we are experiencing more and more is inconsistent guidance for the same departmental initiative from multiple [assistant secretaries]. This creates a field office integration problem and confusion, not to mention incurring additional costs by the contractor(s)."

To address these interrelated problems and to coordinate activities in field offices serving multiple program areas, an assistant secretary was designated to resolve program and administrative conflicts in each field office. But in many instances, this official did not assume or exercise such responsibility. The Secretary required the designated assistant secretaries to develop internal agreements that would explain their responsibilities in every field office. After nearly 3 years, only two of the four assistant secretaries with lead responsibilities had completed their agreements. No agreements were in place to help ease the transition to the reorganization.

DOE's latest reorganization, effective in June 1993, simplifies reporting relationships by having all field managers report to a single official in headquarters. This could provide a basis for better coordination of guidance and oversight activities but also raises the question of program manager accountability over field activities. GAO has long supported a strong and direct relationship between headquarters program managers and field offices as a means for achieving program accountability.

Many of DOE's senior managers told GAO that "fiefdoms" throughout the field structure hampered their operations, a condition that the 1989 reorganization was designed to alleviate. The impact of the 1993 reorganization on this condition is difficult to assess at this point, although we do have some concerns about restoring additional power to field offices without ensuring that line accountability is maintained.

DOE's organizational and reporting problems could be overcome with more effective coordination and communication systems. However, the systems

now in place pose great difficulty for DOE managers and prompted frequent complaints in our interviews.

For example, field office managers have been forced to create separate systems and processes to meet the overlapping requirements from multiple assistant secretaries in several important program areas. In their 1992 reports to the Secretary on management controls, field managers cited problems of the following kind:

- Management systems. Management systems are necessary to support DOE's many program management needs. However, assistant secretaries are using different management systems. For example, the requirements of the Assistant Secretary for Environmental Restoration and Waste Management for budget formulation, control, and accounting differ from those of the Assistant Secretaries for Defense, Nuclear Energy, and other programs.
- ES&H 5-year plans. All assistant secretaries must have a plan of action to address ES&H deficiencies, but each one is providing separate guidance and reporting formats to the field offices.
- Budgeting. When formulating and preparing cost estimates, each assistant secretary uses different formats, priorities, and terminology.

Managers we interviewed also cited inconsistencies in complying with DOE's many safety and security requirements and with self-assessment requirements. In some cases they charged that complying with one requirement will conflict with complying with another.

DOE's "order" system, which has been used to issue formal direction on important operational policies and practices, is at the heart of the Department's communication problems. Orders are poorly coordinated, complex, difficult to interpret, seldom integrated among different units, and rarely (if ever) evaluated for their cost effectiveness. A DOE task force has developed a strategy to correct these problems, and managers welcome this long overdue effort.

In these and other instances, an absence of effective coordination of headquarters communication to field offices had managers concerned about their ability to meet priorities and operate effectively. As a field manager told us:

"[assistant secretaries] don't coordinate or communicate, even within their own organizations . . . . Horizontal communication is infrequent, and when it does happen, is

usually antagonistic and adversarial. With eight [assistant secretaries], there are eight different perceptions of the site mission."

DOE's communication problems also result from headquarters executives' inexperience in managing field offices and facilities and slowness in allocating staff to accomplish the 1989 reorganization. The 1993 reorganization provides a new opportunity to address this condition by making a single headquarters official responsible for allocating resources and making tradeoffs more effectively across agency lines. However, DOE's basic communication problems are largely independent of the structure. Senior managers must work together more effectively on common issues, particularly those affecting field operations, under any organizational structure.

Contract Management Improvements Are Plagued by Management System Weaknesses

The success of DOE's second major management change—reforming contract management—also depends on overcoming many obstacles. Two important DOE efforts to improve contract management are writing more detailed contracts (task-order contracting) and shifting more financial liability onto contractors (the accountability rule). Both these efforts are constrained, however, by management systems that do not provide the sufficient, detailed information needed by DOE officials to monitor contractors' performance—as is required by the new contract management practices.

Financial and project management systems have historically failed to provide detailed data on contractors' activities, a reflection of DOE's long-standing reliance on contractors for basic information on performance and the Department's "least interference" policy for oversight. Managers have expressed serious concerns about their ability to make contractors more responsible for their actions, as expected under new contract management practices. This complaint was made at DOE's largest field office, which has 40 percent of the Department's budget responsibilities, in a late 1992 report:

"The [Albuquerque Field Office] does not currently have the personnel resources or management systems to fully support the program management contract administration or financial management requirements associated with this new [contract management] approach."

DOE has only recently begun to rebuild its management systems. Newer systems require not only more standardized contractor reporting but also

more detail about task-level performance. DOE procurement offices expect that task-order contracting will require about 5 years to implement, an estimate based on the need to develop supporting management systems and to gain experience with newer contracting initiatives.

Work Force Weaknesses May Be DOE's Most Difficult Problem

A second barrier to successful contract management change, and perhaps DOE's most fundamental problem, is the lack of skilled staff in program and contracting oversight positions. The majority of field managers we interviewed voiced strong concern about their staffing situation, and some expressed alarm over the work load required to implement various Secretarial initiatives, particularly those for contract management. Staffing deficiencies extend well beyond contract management, however. Over 60 percent of the senior managers we interviewed cited work force problems as barriers to fulfilling their missions. In addition:

- Under the Federal Managers Financial Integrity Act, most DOE field offices reported to headquarters that work force deficiencies are a "material weakness" requiring remedial action.
- DOE's CFO reported to senior managers that the failure of field offices to staff field CFO offices threatens the Secretary's goals of improved financial oversight of contractors. Field offices responded by stating they lack resources to fully staff field financial positions. For example, the Albuquerque field office has only 4 of the 11 accountants needed to review the financial systems of seven contractors accountable for $4.1 billion in federal budget expenditures.
- DOE has nearly 20,000 employees, but only about 5,500 field staff supervise the 149,000 contract staff (over 5,000 staff work in the power marketing administrations).
- DOE offices that lack staff report being "forced" to rely on support-service contractors in order to complete tasks that should be performed by federal employees. Managers complain about the added cost of using contractors in some situations, the loss of in-house expertise, and situations that could pose conflicts of interest.

Complaints also persist about how poorly prepared DOE's work force is for meeting technical challenges in the newer mission areas of environment, safety, and health. The development of expertise in these areas is proving to be an elusive goal for DOE. Many oversight groups—such as the National Academy of Sciences, the Defense Nuclear Facilities Safety Board, the congressional Office of Technology Assessment, and DOE's own internal review teams—have reported on the need for more technically qualified

staff both within DOE and among its contractors. These reviews question not only DOE's overall technical skills but also staff deployment and training for both contract and technical program management.

In September 1992, citing the need to upgrade the technical capabilities of DOE staff and the slow progress made in implementing training programs, the Defense Nuclear Facilities Safety Board recommended that DOE, among other things, strengthen its training programs and organization units and expand senior line managers' involvement in training. DOE accepted the Board's recommendation and reports taking action.

In addition, a 1992 internal task force identified many barriers to achieving work force goals, including unclear work plans, burdensome procedures for recruiting and staffing, and training deficiencies.

While DOE leadership considers improving staff quality a high priority, much remains to be accomplished. A 1989 Secretarial initiative on work force improvement—the creation of the Office of Scientific and Technical Recruitment—met with little success. Many managers we interviewed did not use the new office (which was subsequently eliminated) and were not informed about its training programs.

DOE increased its staff by about 2,900 from 1990 to 1992. However, because of increases in the contractor population, the ratio of contract employees to DOE field staff has actually risen slightly over the same period, from 26 to 1, to 28 to 1. Recognizing that existing staff must be better utilized, an internal DOE task force reported in late 1992 that the Department lacks an effective process for allocating staff resources. It also noted that the Secretary needs to define priorities more precisely so that staff can be deployed in areas in which needs are most urgent. The task force also recommended that DOE leadership not request additional staff until a comprehensive corrective action strategy is in place for determining staffing needs.

DOE has long suffered from not having a comprehensive strategy to address its work force weaknesses, one in which staff needs are assessed and action plans developed to meet those needs. Recognizing this deficiency, DOE approved a 5-year plan in early 1992 for the "recruitment, training and professional development of technically trained individuals to staff DOE line and oversight offices at all levels of the organization." This plan recommends, among other things, creating a separate training facility to

coordinate DOE's technical training. Although not comprehensive, the plan covers major operating elements of DOE and is a positive step forward.

GAO believes that a comprehensive work force strategy is essential if DOE is to identify opportunities for improvement, set priorities, and plan for the future.

Conclusions

DOE has significant management problems, as reported by many oversight groups and acknowledged by agency leadership. DOE has failed to properly manage and maintain its vast nuclear weapons production complex and has allowed contractors to dominate the Department's activities while they elude management and financial oversight. DOE's efforts to instill more organizational accountability and strengthen control over contractors are promising and welcome steps toward addressing substantial weaknesses. Incoming leadership has also begun implementing new initiatives to address issues raised in this report, although it is too early to draw conclusions about their effectiveness. For these important changes to be successful, however, problems with communication and coordination, management systems, and the work force must be addressed more effectively. Staff capacity is a particularly difficult challenge, affecting not only DOE's ability to administer new contract management changes but also to manage imperative missions in environmental cleanup.

Recommendation

Improving DOE's management will require long-term strategies and a strong and abiding commitment to change from senior leadership. Therefore, we recommend, as a first step, that you develop and implement a "management action strategy" to address the obstacles we have identified as preventing management change from succeeding in DOE. This strategy would articulate key areas of management change, such as enhancing internal communication and strengthening the work force; contain milestones as a basis for monitoring and evaluating progress; and serve both as an agenda for change and as a vehicle for communicating the Department's highest management priorities to the staff.

As part of our management review, we will prepare additional reports that build on the issues raised in this letter. Organizational, contracting, and work force issues will be specifically addressed in our assessment of DOE's environmental cleanup program; financial and management systems will be addressed in two separate reports; and contracting progress and alternatives will be further evaluated in another separate report. We will

also issue a report on laboratory management issues. A final report will summarize our management findings.

Agency Comments

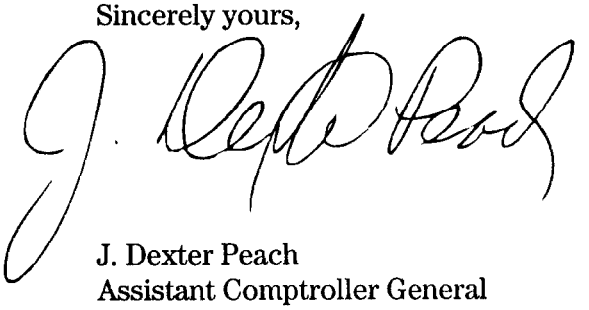
We presented our findings to you on May 25, 1993. DOE also provided us with a summary of comments by several senior managers on a draft of this report. You agreed that DOE needs to change the way it does business and generally agreed that our findings accurately portrayed the many organizational and contract management problems facing the Department. You also said you believed your new designation of an Associate Deputy Secretary for Field Management will address many of the problems that plagued the prior DOE structure.

We believe that the new structure, effective in June 1993, has potential for solving problems addressed in this report. However, we also believe the new structure raises other concerns, including, for example, how accountability will be achieved under the new reporting relationships now that headquarters program managers no longer have direct authority over field offices. Furthermore, we believe that DOE's basic communication problems are not easily overcome by new reporting arrangements. DOE has significant and long-standing internal communication problems that exist quite apart from structural considerations. Additional DOE comments are discussed in the report and changes have been made where appropriate.

This work was performed under the direction of Victor S. Rezendes, Director of Energy and Science Issues, who may be reached on (202) 512-3841 if you or your staff have any questions. Other major contributors to this report are listed in appendix IV.

We are sending copies of this report to interested congressional committees and subcommittees and to the Director, Office of Management and Budget. We will also make copies available to others upon request.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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Abbreviations

AEC	Atomic Energy Commission
CFO	Chief Financial Officer
CRADA	Cooperative Research and Development Agreement
DOE	Department of Energy
DP	Defense Programs
EM	Environmental Management
EPA	Environmental Protection Agency
ERDA	Energy Research and Development Administration
ES&H	Environmental, Safety, and Health
FERC	Federal Energy Regulatory Commission
GOCO	government-owned, contractor-operated
JCAE	Joint Committee on Atomic Energy
MOA	Memorandum of Agreement
M&O	Management and Operating Contractor
MIT	Massachusetts Institute of Technology
NE	Nuclear Energy
NRC	Nuclear Regulatory Commission
OPEC	Organization of Petroleum Exporting Countries
PSO	Program Secretarial Officer
SSC	Superconducting Super Collider
TOC	task-order contracting

Major Challenges Facing the Department of Energy

The Secretary of Energy is responsible for one of the most complex and disparate departments in the federal government. Created in 1977 from a number of diverse agencies, the Department of Energy (DOE) has become the agency primarily responsible for managing the nation's nuclear weapons production complex, developing energy policy, and conducting energy research and development. In recent years DOE has shifted its focus away from producing nuclear weapons, as the demand for the stockpile has declined, to cleaning up the enormous environmental damage resulting from decades of weapons productions in major facilities around the country.

This appendix describes the Department's history and the many policy and management challenges DOE executives face as they seek to improve internal practices in the face of substantial mission changes.

DOE's Genesis

Today's DOE is the result of an administrative evolution that began more than 4 decades ago. Many of the original World War II weapons activities from the Manhattan Project and the post-war Atomic Energy Commission (AEC) have continued to dominate DOE's responsibilities and the perspectives of past eras continue to shape decisions.

DOE's Predecessor Agencies

Beginning in 1947, the AEC assumed the responsibilities and operations of the wartime Manhattan Engineer District (Manhattan Project), which had built and tested the world's first atomic bombs. Under the authority of the Atomic Energy Act of 1946, the AEC operated uranium-enrichment and plutonium-production plants, a network of science and technology laboratories for research and development of both military and civilian applications of atomic energy, and a program of research fellowships to promote nuclear and other sciences. From 1946 to the mid-1970s, the AEC was overseen in the Congress solely by the Joint Committee on Atomic Energy (JCAE).

The Atomic Energy Act was amended in 1954 to create a reactor development program and to promote the peaceful uses of the atom. Consequently, the AEC both promoted and regulated nuclear power in the United States and controlled exports of nuclear technology and materials. The AEC's responsibilities were changed again under the Energy Reorganization Act of 1974, principally to avoid possible conflicts between promoting and licensing the commercial nuclear industry, and to address the emerging "energy crises." The AEC's responsibilities were transferred as

part of the reorganization to two new agencies in 1974: the Energy Research and Development Administration (ERDA), with responsibility for energy technology research, development, and demonstration and for nuclear weapons production; and the Nuclear Regulatory Commission, charged with licensing the commercial nuclear industry.

But by the time of this split jurisdiction, other basic changes had occurred that would affect the formation of U.S. energy policy. The Congress abolished the JCAE in 1976; with that change, control of atomic and energy policy was dispersed to more than 20 congressional committees and subcommittees. And the first of several oil supply and price shocks in 1973 dramatized the growing U.S. dependence on imported oil from the politically volatile Mideast.

In response to the oil embargo, federal energy responsibilities were restructured in 1973, and again in 1974, when the Federal Energy Administration Act of 1974 created a new agency that quickly became the focal point for federal energy programs. Although the Federal Energy Administration (FEA) was expected to manage the short-term aspects of the nation's energy crisis, its functions proved to be so necessary that it became the primary agency responsible for developing energy policy, regulating crude oil and petroleum production price and allocation, developing and promoting energy conservation programs, and collecting energy data.

However, while this arrangement allowed for more centralized administration in Washington, D.C., the decentralized structure of the AEC, including its nationwide network of laboratories and weapons sites, continued.

DOE's Creation

The most important of many efforts to reorganize energy policy-making was the 1977 Department of Energy Organization Act. Under the act, the basic functions of ERDA and FEA were centralized within DOE, and the new Department's dominant mission was to bring together all of the major energy programs in the federal government, including the economic regulation of energy supply systems.

The new DOE also assumed the Department of the Interior's responsibilities for establishing policies and certain economic regulations for the development of energy minerals on federal lands and for overseeing the power marketing administrations, such as Alaska and

Bonneville. The act also established, as an independent regulatory agency within DOE, the Federal Energy Regulatory Commission (FERC), which assumed many of the Federal Power Commission's regulatory responsibilities for natural gas and electric power.

In effect, the act provided for a (1) framework for federal energy policy within a cabinet-level department, (2) clear focus on energy policy and programs, and (3) central staff capability to analyze a wide range of energy issues.

The dominant policy issue facing the newly created DOE was the federal role in regulating energy. Fundamental changes in national and international markets had left the United States and other industrial nations vulnerable to supply and price changes in the world oil market as a result of production cuts and embargoes by the Organization of Petroleum Exporting Countries.

While the existing energy "programs" were consolidated in DOE, it still did not have authority over all energy policy issues. Some of the most important powers remained elsewhere in the Cabinet: Treasury, to tax energy; Transportation, to set vehicle standards; Interior, to regulate fossil-fuel exploration and development at federal and off-shore sites; and Commerce, to export and decide on trade.

At the headquarters level, DOE reshaped many programs and functions to fit President Carter's national energy policy. To form the early DOE headquarters organization, program offices or assistant secretaries were clustered around energy technologies, according to their evolution from research and development through application to commercialization. This approach reflected the administration's decision to formulate a comprehensive energy policy, rather than to manage energy programs by fuel type alone.

In the late 1970s, DOE's individual research and development projects in solar, geothermal, fossil, and nuclear energy were placed under the Assistant Secretary for Energy Technology. Once scientific and technical feasibility was determined, projects were transferred to an Assistant Secretary for Conservation and Solar Applications, who had specialized expertise in commercialization and energy markets. The Assistant Secretary for Defense Programs was responsible for nuclear weapons research and development. And the Assistant Secretary for the

Environment was responsible for all departmental programs' compliance with environmental and safety laws, regulations, and policies.

Reliance on Contractors

The most salient feature of the Department is its 50-year-old practice of relying on private contractors—corporations and universities—to accomplish most of its missions and operations. Since the Manhattan Project, the civilian successor agencies—AEC, ERDA, and DOE—have relied almost exclusively on private contractors to administer and conduct departmental functions. Indeed, seven of every eight workers at DOE is actually employed by a private contractor, the result of its longstanding Management and Operating (M&O) contracting policy and its extensive decentralization throughout the United States.

This arrangement has placed great emphasis on contract administration, an area of expertise that the previous Secretary had found lacking and had attempted to reform. Under the AEC, contractors that managed and operated federal facilities, the M&O contractors, were given great leeway in their operations, under a philosophy of "least interference." Moreover, the culture of extreme secrecy over national security affairs resulted in limited outside scrutiny of DOE's contractor operations. The AEC expressed concern early in its development about this unusual delegation of responsibility. Nevertheless, the M&O contractor approach has continued to be DOE's principal management strategy.

By the late 1980s, inattention to the physical condition and day-to-day operations of the nuclear weapons complex had led to its near collapse. This condition was evidenced by the forced shutdown of tritium production reactors at Savannah River and bomb-trigger manufacturing facilities at Rocky Flats. Since then, revelations about serious and widespread environmental contamination and safety and health problems have surfaced throughout the 13-state, 17-site complex.

In the wake of these revelations, the priority of the complex had to shift to environmental restoration and reconfiguration of the existing facilities. Not surprisingly, contractors are expected to play a leading role in this effort as well.

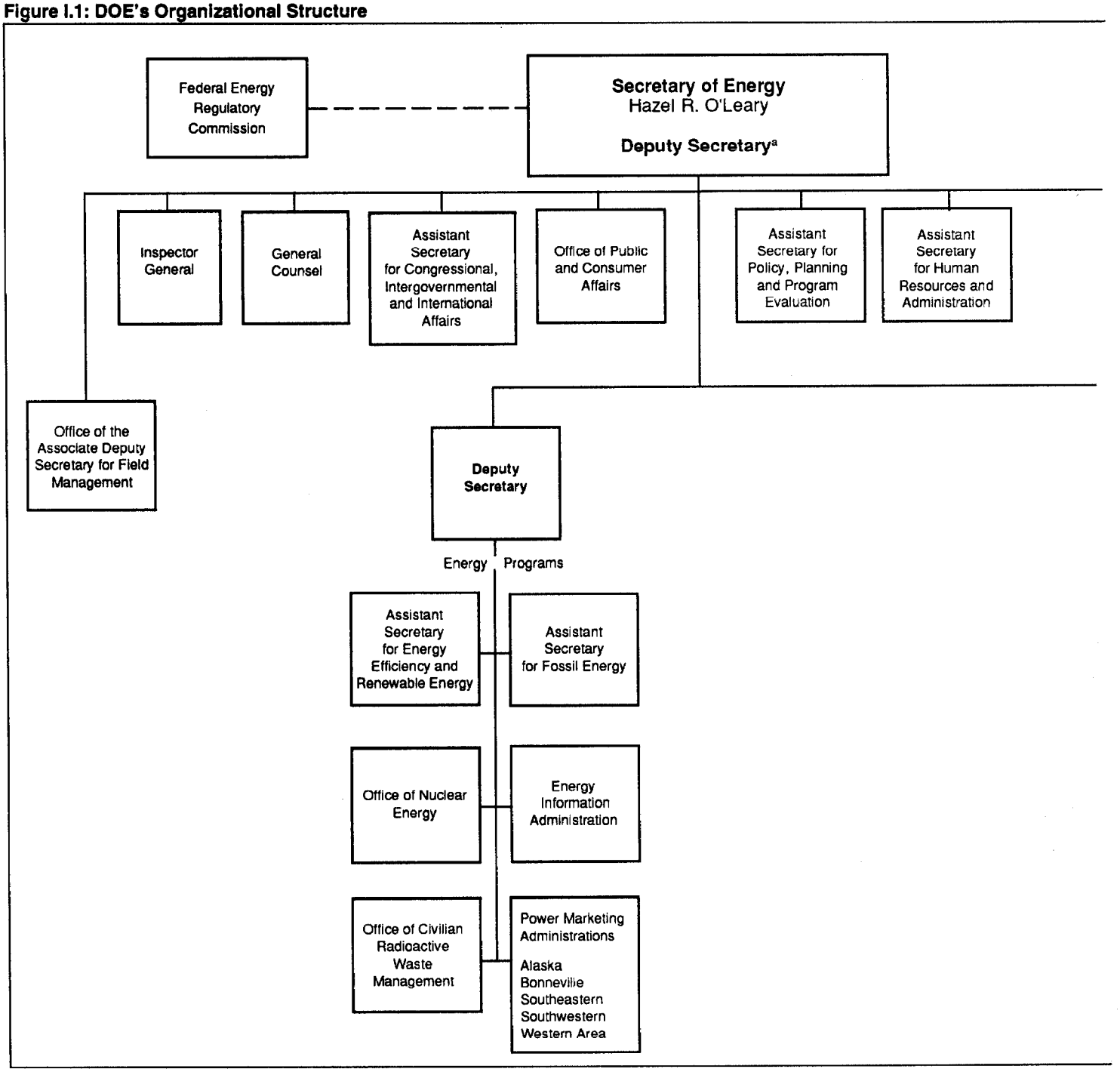
The Modern Department of Energy

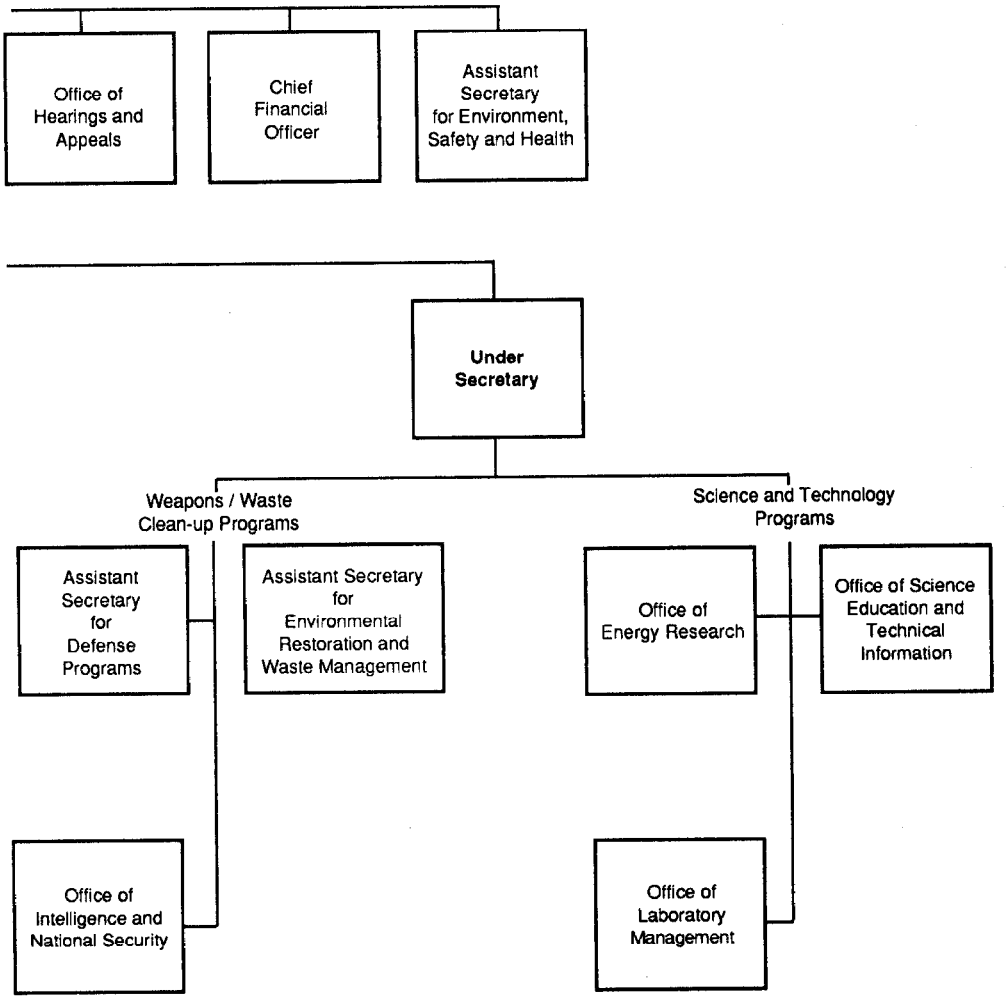
Today, DOE is still responsible for a range of policy issues, many peripheral to energy production, consumption, and regulation. These include basic

and applied research and science education, as well as the traditional nuclear weapons role.

DOE's structure has also undergone change, although the basic orientation to nuclear weapons and technology has been in place since the agency's creation. DOE's present structure is the third major form of organization in the Department's 15-year history. Below the Secretary, Deputy Secretary, and Under Secretary are various offices and eight assistant secretary positions organized along major program lines. Specific duties among the top three executives have changed over time and have been the subject of debate and controversy. In the past, there was confusion about whether the Under Secretary would assume the role of chief operating officer. While the act creating DOE left the responsibilities for the top three roles up to each administration, an early report by a consultant noted widespread confusion at several levels about the duties and responsibilities of the three senior officers.

Figure I.1: DOE's Organizational Structure

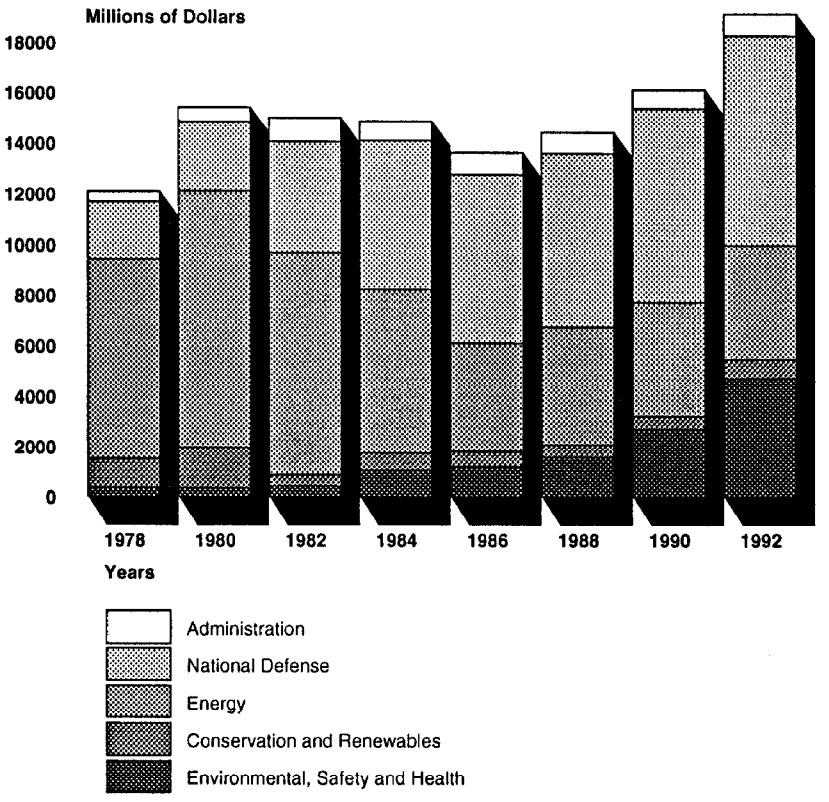




[a]Deputy Secretary oversees Energy Programs and serves as Chief Operating Officer of the Department within the Office of the Secretary.

DOE had an annual budget of $20 billion in fiscal year 1993, with roughly two-thirds of it for defense and environmental restoration and one-third for energy and other matters. As shown in figure I.2, DOE's budget emphasis has dramatically changed since the mid-1980s.

Figure I.2: DOE's Changing Budget Priorities



Since its inception, DOE has maintained a network of field offices to administer its extensive operations. Historically, field offices have wielded considerable influence because they serve as the primary contact between DOE and the contractors that actually run DOE's multibillion-dollar facilities. To improve accountability, Secretary James D. Watkins placed the field offices under the control of assistant secretaries in 1989. This was intended to shift power to cognizant headquarters units, a reform that is discussed in more detail in appendix II.

Major Policy Challenges Facing DOE

DOE's principal missions are changing rapidly as the nuclear arms race slows down: For the first time in U.S. history, no new nuclear weapons are being designed or built, and expectations are increasing that DOE will make significant contributions in science and environmental cleanup. (See fig. I.2.) Secretary Watkins also strove to better control DOE and its contractors in the face of widespread criticism of mismanagement and neglect of environmental, health, and safety issues. Complicating these changes is the increasingly complex environment in which DOE must plan and manage. DOE leadership must work more closely with parties directly affected by the Department's programs—other federal agencies, state and local governments, regulators, and interest groups.

Table I.1: DOE's Missions

Traditional missions	New and emerging missions
Nuclear weapons production	Dismantling nuclear weapons
Energy and technology research	Environmental cleanup technology
Energy policy development	Technology transfer/industrial competitiveness

Some of the more pressing challenges facing DOE are discussed below.

Changing Agency Focus

The Department and its missions have evolved. Originally established to deal predominantly with the "energy crisis" of the 1970s, DOE was later proposed for abolishment and then pressed to its physical and managerial limits to produce nuclear weapons. DOE may soon become the federal agency with the largest environmental mission, although many of its managers and executives are trained in nuclear and other advanced sciences.

Beyond the changes in mission and the shifts in budget priorities, DOE is undergoing other fundamental transitions. The emphasis on the environment begun by Secretary John S. Herrington and the "culture change" instituted by Secretary Watkins are part of a broader management reform that—if maintained by the current administration—is likely to transform DOE into a very different organization by early in the next century.

New Missions for the National Laboratories

An essential feature of DOE and its predecessor agencies is the nationwide network of 9 multiprogram and 21 program-dedicated science and technology laboratories. A direct result of the Manhattan Project, the

system of national science and engineering laboratories has evolved to become nearly as diverse as the United States itself.

Currently, each of the large, multiprogram laboratories is noted for specializations: Los Alamos and Lawrence Livermore for nuclear weapons design and testing; Sandia for weapons engineering; Idaho for multiprogram engineering and reactor research; Argonne, Oak Ridge, and Pacific Northwest for energy technology; and Brookhaven and Berkeley for basic science and engineering.

The three defense laboratories today (Los Alamos, Livermore, and Sandia) view their future missions in the context of the post-Cold War efforts to reduce dramatically the U.S. and former U.S.S.R. nuclear weapons stockpiles and of the increased competitiveness required of U.S. companies when developing and promoting exports.

One recent development to improve technological transfer to the private sector is the creation of Cooperative Research and Development Agreements (CRADAs) between the laboratories' researchers and their counterparts in U.S. industry. Among the "weapons labs," about half of their budgets, and most of their employees are now devoted to nondefense activities.

Reconfiguration of the Nuclear Weapons Complex

Management of the nuclear weapons complex and the national laboratory system—the dominant features of the AEC and of energy policy since the 1940s—is today in disarray. (Table I.2 shows DOE's weapons complex facilities.) Production activities have changed to dismantling the vast nuclear weapons arsenal, and the bulk of DOE's attention and money are now directed to environmental restoration of the most seriously contaminated sites.

Table I.2: Major DOE Nuclear Weapons Facilities

State	Site	Missions
Calif.	Lawrence Livermore	Nuclear weapons research and development
Colo.	Rocky Flats	Nuclear weapons trigger assembly, plutonium processing
Fla.	Pinellas	Neutron generator and warhead component manufacture
Idaho	Idaho NEL	Chemical processing and fuel reprocessing, multiprogram engineering and reactor research
Ky.	Paducah GD Plant	Uranium enrichment by gaseous diffusion
Mo.	Kansas City (Bendix)	Electronic warhead component manufacture and assembly
N.Mex.	Los Alamos NL	Nuclear weapons research and development, plutonium processing
N.Mex.	Sandia NL	Nuclear weapons research
Nev.	Nevada Test Site	Nuclear weapons testing
Ohio	Ashtabula	Uranium fabrication (fuel and targets for Hanford and Savannah River reactors)
Ohio	Fernald	Uranium processing
Ohio	Mound	Nonnuclear weapons components
Ohio	Portsmouth GD Plant	Uranium enrichment by gaseous diffusion
S.C.	Savannah River Site	Tritium production, loading and recycling
Tenn.	Oak Ridge NL	Uranium and lithium processing
Tex.	Amarillo (Pantex)	Nuclear warhead assembly and disassembly
Wash.	Hanford Reservation	Plutonium production

DOE is forced to modernize as well as reconfigure the complex in the face of changing priorities and an overall deterioration of facilities. A reconfiguration plan developed just a few years ago is now recognized as obsolete, given dramatic shifts in international political events. DOE estimates that $50 billion will be devoted to modernization. This amount, and the nature of modernization options, continue to be revised.

Environmental Dominance

In the early 1980s, DOE spent ten times more for weapons production than for waste management, but since then the cost of treating and disposing of nuclear waste has escalated. In 1988, waste expenses were one-sixth of

those for weapons. By 1990, they were one-third. And by 1992, they were more than half. Current projections show that environmental restoration and waste management may constitute more than two-thirds of DOE's budget by 1995.

Environmental issues have recently taken such a dominant role in DOE policy that a separate Office of Environmental Restoration and Waste Management was created in 1989 to focus program attention on environmental issues, and a new kind of contract, the Environmental Restoration Management Contract, was created to highlight and consolidate environmental management.

DOE's decision-making environment has been altered and made more complex by a variety of recent actions. For example, increasingly DOE is involved in policy decisions by other authorities with vested interests in its issues, among them state and local governments, state regulators, the Congress, and private groups acting independently or through the federal and state courts. These groups not only take DOE to task for past mistakes (as EPA did with a fine for noncompliance with procedural and reporting requirements) but also work to set the Department's agenda (for state-EPA compliance agreements or to determine priorities for cleanup at various weapons-complex sites).

Direction of Research, Science, and Education

DOE has inherited responsibilities for basic research that were developed during the heyday of the AEC and flourished in the national laboratories. In its 1991 National Energy Strategy, DOE encouraged "basic research" in several disciplines, including mathematics; physics; chemistry; material science; biology; atmospheric, oceanic, hydrologic, and earth sciences; behavioral and social sciences; and engineering.

In addition to promoting federal and private sector support for this research, DOE has funded projects to develop scientific and technical literacy among the public and to improve skills among its work force. The national laboratory system is key to expanding developments in this area, improving energy-related basic and strategic research, and improving economically competitive industries and products. In research and development, DOE is the third largest civilian funder, with nearly twice the combined budget of the National Science Foundation and U.S. Department of Agriculture Department.

External Forces Affecting DOE

While DOE's mission priorities are changing from weapons production to environmental restoration, the lessening of secrecy within the Department has opened it and its facilities to public scrutiny for the first time.

To compound this management challenge, state and local authorities and laws that at first rarely applied to activities in the DOE's domain, and federal environmental laws that had only been enforced in a piecemeal fashion since the early 1980s, are now impinging on all levels of decision-making. In addition, governmental agencies (chief among them EPA) have recently fined DOE for violations. Such outside influences, which have become common since the Department publicized its own environmental problems in 1988, are sure to dominate decision-making for decades to come.

Management Challenges

At the same time that DOE is faced with changing missions and priorities, its management is under severe stress. The deteriorated and, in some cases dangerous, condition of the nuclear weapons production complex has called into question the effectiveness of the Department's long-standing management system. Widespread criticism of the Department and its contractors by GAO and others began to surface in the mid-1980s, raising questions about the Department's overall capability to effectively oversee contractor performance for such an important and expensive operation. The Secretary of Energy and top management understood these issues and recognized that fundamental reforms had to be initiated. The success of DOE's reform efforts are the subject of appendix II.

Overcoming Obstacles to DOE Reforms

Over the past few years, DOE has launched several initiatives to address its many policy and management challenges. These include measures to increase staff and contractor sensitivity to environmental, safety, and health (ES&H) concerns as well as changes to generally improve operations. To ensure the success of these initiatives, DOE made significant changes in both organizational structure and contract management. These changes were intended to strengthen internal accountability and contractor oversight.

To measure progress on these and other DOE initiatives, we used a structured approach to interview 174 senior DOE executives in headquarters, field offices, and laboratories. We supplemented these interviews with discussions with contractors and analyses of internal and consultant reports on DOE operations. Our interviews revealed that DOE reform efforts address many weaknesses and are supported by managers throughout the organization, but significant obstacles are preventing the success of these efforts. In particular, managers were unclear about their new roles and responsibilities under the 1989 reorganization, and uncertainty surrounds the likely success of new contracting policies. As a result, many questions remain about DOE's overall progress toward addressing its fundamental problems.

This appendix discusses how effectively recent initiatives are being implemented at DOE headquarters and field offices. Incoming DOE leadership has also begun implementing initiatives to address issues raised in this report, although it is too soon to draw conclusions about their effectiveness. Our analysis was based primarily on prior initiatives, most of which DOE continues to implement. A more complete description of our methodology appears in appendix III.

DOE Has Significant Management Weaknesses

Widespread criticism of DOE and its contractors began to surface in the mid-1980s, coinciding with several accounts of serious environmental contamination and maintenance neglect throughout the nuclear weapons complex. GAO, other groups, and internal DOE reviews have widely reported on those management weaknesses. DOE now acknowledges its shortcomings, as expressed by the prior Secretary's summation of the Department's condition in 1989:

- management neglect, unsafe procedures, and noncompliance with environmental laws throughout DOE's facilities and field offices;
- no control, accountability, or effective oversight in line management; and

- unsatisfactory contract and financial management.

These conditions have raised questions about the ability of DOE to properly manage its contractors; more fundamentally, they call into question continuing the use of a decentralized management philosophy that dates from the Manhattan Project. DOE's past near-total reliance on contractors working with minimal government oversight and accountability has led to the current conditions that the leadership has sought to correct.

DOE Initiatives to Address Management Problems

Making contractors more responsive to the government, and the government more effective in its oversight, are the basic management challenges confronting DOE. DOE's management has recognized that it needs to change the ways it organizes, controls, and directs its own staff and that of its many contractors. DOE also recognizes the need to incorporate more strategic thinking into its planning processes and to rebuild its work force's competency to a level that will both improve operations and restore public confidence in government's ability to manage the difficult issues in energy policy and the nuclear weapons complex.

Because of a desire to "reform" DOE, top management in the previous administration launched initiatives to bring about operational improvements. These initiatives, covering both policy and management issues, are impressive in their breadth and detail and represent a positive step forward for DOE. For example, DOE has

- begun to develop a series of strategic plans in critical areas, such as environmental restoration and waste management and reconfiguration of the nuclear weapons complex;
- conducted intensive "Tiger Team" reviews of major facilities to uncover and document adherence to ES&H issues, and required action plans to correct problems found;
- established self-assessment offices throughout DOE as a wayto institutionalize attention to sound management practices; and
- required strategic planning in decision processes throughout the Department.

The senior managers we interviewed generally supported these initiatives to solve problems at DOE. While many of the managers looked favorably on the initiatives, even those that covered substantial weaknesses, they were less supportive of the implementation. For example, over 80 percent of

DOE headquarters, field, and lab managers we interviewed told us that the concept behind Tiger Teams is excellent or good, although many stated that some Tiger Teams were adversarial and costly. Senior managers also favored implementing corrective action plans resulting from Tiger Team reviews. Managers also generally favored the goals of reorganization (to improve lines of accountability) and contract management changes (to improve contractor accountability). Table II.1 describes some of these initiatives and the senior managers' views of them.

The former Secretary said that DOE's initiatives were designed to bring about a "culture change" in DOE; that is, a change in attitude and behavior about the importance of ES&H activities to the Department's business. A culture change can only occur, however, if DOE's supporting organization is responsive to the departmental goals.

Table II.1: Managers' Views on Selected DOE Initiatives

Problem area	Initiative	Strengths reported	Concerns expressed
Lack of a process for setting priorities	Institute strategic planning requirement	Addressed DOE's need for a vision and long-term planning	Lacks tie-in with budget and national energy strategy
	Prepare the National Energy Strategy	Needed as a basis for setting goals and priorities	Diluted by political interests
ES&H deficiencies at DOE facilities	Update the ES&H 5-year plan	Provided ongoing planning to resolve ES&H problems	Limited benefits from resource-intensive efforts
	Conduct Tiger Team reviews	Helped sensitize staff to ES&H concerns; established baseline at facilities	Reviews too adversarial and costly, emphasized problems, not solutions, and lacked consistent criteria
	Prepare Tiger Team corrective action plans	Provided a framework for correcting deficiencies; ensured continuing ES&H focus	Plans not coordinated or prioritized on national basis; require extensive tracking and reporting mechanisms; plan delays could lead to additional criticism of DOE
	Improve ES&H oversight	Ensures continuing ES&H focus	Increased oversight creates adversarial atmosphere and micromanagement; duplication; insufficient staff to implement; contractors used for oversight which creates potential conflicts of interest
	Establish self- assessment offices	Aids culture change; ensures continuous improvement; eliminates need for more Tiger Team reviews	Role and guidance of offices unclear; offices should not duplicate other functions; potential for reprisals due to disclosure of problems

(Table notes on next page)

Note: These initiatives were drawn from DOE's annual reports to the President in support of the Federal Manager's Financial Integrity Act reporting requirements and from other documents provided by DOE. In addition to these initiatives, DOE made many other changes to improve policy and management, including establishing an Office of Nuclear Safety, conducting environmental assessments, and initiating science education programs.

Essential to achieving DOE's goal is making contractors more responsive to government interests and making DOE staff more effective in their oversight of contractor behavior. To achieve these important objectives, DOE made two key management changes: (1) realigned internal reporting relationships and (2) strengthened contractor accountability and agency oversight. Table II.2 describes several of these management changes and their strengths and weaknesses, as discussed in our interviews with senior managers. The remainder of this appendix focuses on these management changes, which we believe are the key to making fundamental improvements in DOE. Moreover, we believe the problems DOE faced in implementing these initiatives should serve as "lessons learned" for incoming leadership.

Table II.2: Key DOE Management Changes

Management problem	Management change	Strengths	Weaknesses
Field offices highly autonomous, with little accountability to headquarters program leadership	Reorganize to require field managers to report directly to a Program Secretarial Officer	Provides framework for line accountability over field operations	Many dual reporting situations, causing confusion in priorities. Duplication in administration and oversight activities Confusion over new field roles especially in facility funding ("landlord" responsibilities) Reorganization made without implementing procedures in place Major communication problems between field and headquarters, and among program offices
Weak practices for overseeing contractors	Implement task order contracting and apply contractor accountability rule	Exerts control over contractors and holds contractors more accountable for their actions	Lack of technical expertise, making it difficult to implement new contracting provisions Increased paperwork requirements No consistent national approach to implementing new contracting provisions Information lacking to support new contract approaches Accountability rule difficult to enforce because DOE lacks ability to monitor contractors
Lack of technically qualified staff to oversee contractors	Establish an Office of Scientific and Technical Recruitment Create 5-year plan for improving work force skills in nuclear areas	Provides a potential focus for addressing work force problems Provides focus and attention on training improvement	New office abolished No comprehensive departmental strategy on human resources management
Weak project and financial management systems available to support management needs	Establish project and financial management requirements Establish Chief Financial Officer positions in field offices	Provides framework for improving management information and oversight needs.	Systems not in place in time to support new contracting initiatives Many competing priorities within funding constraints

Realigning Reporting Relationships

Recognizing that its management structure lacked accountability, DOE began its realignment of basic reporting relationships in 1989. These changes were intended to make field units directly accountable to key headquarters program offices, among other things. Under Secretary of

Energy Notice 6 (referred to as SEN6), field offices reported to a "lead" Program Secretarial Officer (PSO). The lead PSO is usually an assistant secretary and typically represents the headquarters unit that provides the dominant funding for facilities within a field office's jurisdiction. This is a major change from DOE's traditionally decentralized structure, in which field offices reported to the Under Secretary, effectively bypassing the assistant secretary with program responsibility.

Previously, DOE and its predecessors allowed field offices the authority and independence to operate facilities largely removed from the headquarters program manager's direct control. This arrangement grew from the practice in the early years of the AEC to contract for services under urgent deadlines and has been perpetuated as a management style. Past leadership cited this arrangement as the primary cause for weak accountability in DOE. Before the recent reforms of SEN6, senior headquarters program managers could not exert direct authority over facilities. This situation was magnified in the mid-1980s, when the deteriorating condition of the nuclear weapons complex became public, calling into question DOE's internal structure for oversight and accountability.

GAO believes that having field units report directly to senior officials at headquarters who are responsible for a program is a promising strategy. We have supported stronger headquarters-to-field-program accountability in DOE, and having field offices report directly to program assistant secretaries is a way to establish accountability. For example, our 1981 report on DOE's organizational structure recommended that field program staff report directly to DOE headquarters program managers, a suggestion DOE did not implement at the time.[1] Although our recommendation is a variation of Secretary Watkins' realignment, the goals are the same—to establish a more direct line of command between headquarters and field program personnel.

Many Obstacles Are Preventing DOE's Reorganization From Working

Our structured interviews with senior officials reveal that many factors are working against the success of the reorganization. After more than 3 years under the reorganization, procedures detailing responsibility for each aspect of running the facilities have not been completed. Reporting arrangements are often unclear, and headquarters guidance and direction is incomplete for many areas. As a result, field offices remain confused

[1] A New Headquarters/Field Structure Could Provide a Better Framework for Improving Department of Energy Operations (GAO/EMD-81-97, Sept. 3, 1981).

over their roles, and senior program managers are not fulfilling their responsibilities to integrate and coordinate headquarters oversight and policy direction. These conditions effectively prevents the reorganization from working.

Confusing Reporting Relationships

We, along with other internal reports and consultant studies, have uncovered continuing confusion with field roles and responsibilities among the field offices vis-a-vis their reporting relationships under SEN6. Confusion arises when many assistant secretaries have significant interests in the same facility. Roles and responsibilities for facility operations blur. Overall reporting between field offices and headquarters must be established and understood. And direction and guidance on program matters and oversight from headquarters offices needs to be clarified, coordinated, and integrated if the lead PSO concept or any other scheme is to work effectively.

For example, all three defense laboratories (Los Alamos, Lawrence Livermore, and Sandia) report to Defense Programs in headquarters. However, the field office in San Francisco oversees administrative matters at Lawrence Livermore, a defense laboratory, but reports to Energy Research. By contrast, Los Alamos—Livermore's sister laboratory—reports to the Albuquerque field office, which reports to Defense Programs. The same contractor operates both laboratories, yet must administer each by the different criteria of the offices at headquarters.

Similar confusion exists with field offices and facilities reporting to the headquarters office of Nuclear Energy. The Assistant Secretary for Nuclear Energy is the lead PSO for the Idaho and Oak Ridge field offices, but these offices and their facilities have few programs in nuclear energy. The dominant sources of funds for the Idaho field office are the headquarters offices of Environmental Management and Defense Programs, not Nuclear Energy. This confusion of reporting relationships prompts considerable concern among field managers and their contractors about meeting priorities for all the PSOs for a program located at a site. The situation is especially confusing in Idaho, where eight PSOs have programs under the Idaho field office's jurisdiction. The impact of this situation was expressed by a field office manager in a 1992 memorandum to the Under Secretary:

"... what [the reorganization] fails to do is to provide the protocols and guidance essential to efficient and cost effective implementation of the work at hand. . . . [DOE's chain of

command] in essence creates eight direct channels into one or more contractors for which there is a single contracting officer. . . . What we are experiencing more and more is inconsistent guidance for the same departmental initiative from multiple [assistant secretaries]. This creates a field office integration problem and confusion, not to mention incurring additional costs by the contractor(s)."

DOE's finance managers in the field report simultaneously to both their field office managers and to the departmental Chief Financial Officer (CFO), who does not exert direct authority over field offices. Although this dual reporting situation can create potential conflicts in priorities at both the field and headquarters level, we support expanding CFOs' control in field offices.

Paying for infrastructure in shared facilities has also become confusing. A fundamental premise for success with the lead PSO concept is to establish responsibility for funding basic services and operations of facilities (called "landlord" responsibilities) managed by the field offices. This includes sharing the cost of maintenance, utilities, security, and similar services among those PSOs who share facilities controlled by a field office. Many field managers we spoke with were uncertain and confused about how these areas will be funded and who will oversee their actions from headquarters when multiple offices share facilities. DOE finally provided guidance in this area in October 1992, more than 3 years after the reorganization became effective.

The National Academy of Sciences' 1989 report on the weapons complex also raised a concern about the reorganization.[2] The Academy agreed that DOE line management should be strengthened but observed that SEN6's plan does not adequately address how conflicting needs are to be reconciled between environment, health, and safety, and production.

These particular situations are not common to all DOE sites but serve to illustrate the complex reporting relationships set up under SEN6. By creating complex and sometimes confusing reporting relationships, the new realignment is not achieving its goal of establishing more accountability within DOE's diverse organizational structure. According to nearly 90 percent of the 114 DOE senior managers we interviewed, organizational lines of authority and responsibilities need to be clarified (we did not ask the 60 lab managers we interviewed the same question). Over half of these managers told us that organizational clarifications are "greatly" needed.

[2]The Nuclear Weapons Complex, National Academy of Sciences, 1989.

We recognize that some confusion inevitably results when roles and responsibilities are changed, and we appreciate DOE's efforts to redirect an organization that has developed over 40 years. The incoming Secretary has modified reporting relationships once again and now has, effective in June 1993, field offices reporting to a separate headquarters office headed by an Associate Deputy Secretary for Field Management. The Secretary hopes this new reporting arrangement will improve, among other things, internal coordination and contractor oversight. We also believe that assistant secretaries are the key to making the organization operate smoothly under any organizational scheme. Memorandums of Agreement (MOAs) were drafted to define the roles and responsibilities of various headquarters offices for particular field offices. These MOAs, the formal process for implementing SEN6 under the prior Secretary's structure, were essential for strengthening line management in DOE. Unfortunately, these MOAs were not developed early enough to ease the transition to the new structure. Although the field realignment was announced in 1989, by early 1993, more than 3 years after the reorganization was begun, only two of the four assistant secretaries with lead responsibilities had completed their agreements. None were completed when the reorganization began.

The new Associate Deputy Secretary for Field Management, charged with setting priorities and managing the day-to-day field network, faces a major challenge in coordinating the priorities and concerns of various program offices reporting to assistant and undersecretaries. Although the new structure has just been announced, we have a concern about how program accountability will be achieved since program offices now have no direct reporting authority over field units.

Uncoordinated Headquarters Guidance

Field office and laboratory managers with whom we spoke complained repeatedly about the conflicting program direction and guidance they receive from headquarters units. PSOs, as well as administrative offices, inundate field offices with DOE orders, directives, and notices on everything from facilities management to program directions. Managers said that these various forms of guidance are generally not evaluated for their impact on operations, nor are they coordinated to avoid inconsistencies and duplication across program and organizational lines. Conflicting guidance is also costly because even on a common issue, contractors are forced to establish separate systems for each PSO's requirements, passing the costs on to DOE. Our structured interviews uncovered many examples of these conditions, such as the following:

- Self-assessment offices are under a key Secretarial initiative designed to institutionalize self improvement in ES&H matters. However, there is no uniform and consistent approach to self assessments in DOE, in part because PSOs have sometimes established separate requirements for how these offices should be organized and staffed and how they should report to the PSO.
- Field offices are having trouble implementing the extensive requirements in the corrective action plans that were developed from Tiger Team reviews. These plans cover most DOE sites. Because insufficient funding prevents correcting all the Tiger Team findings at the same time, priorities are needed. Lead PSOs, who logically play a role in setting and coordinating priorities, have not set priorities. As a result, field offices must attempt to please all PSOs simultaneously, a situation that has duplicated both reporting and priority setting by field offices. Ironically, this is a problem the lead PSO concept was designed to eliminate.
- Field offices receive multiple PSO directions on complying with DOE's many safety and security orders. Each PSO issues instructions for how a facility should meet its goals in these areas. One field manager discussed the elaborate procedure that Defense Programs requires, including a line-by-line compliance audit of each facility under Defense Programs' control. Environmental Management, on the other hand, is developing a separate data base to meet requirements, but this data base is not compatible with Defense Programs' needs. In this instance, Defense Programs and Environmental Management fund the same facility for which the field office is responsible, making compliance with both program offices difficult and costly. And the PSO for Nuclear Energy, to whom the field offices report, has not issued any safety or security instructions.

Internal DOE reports found similar conditions. For example, in their 1992 management control reports to the Secretary, field managers cited problems of the following kind:

- Management systems. Assistant secretaries are using different systems. The budget formulation, control, and accounting requirements of the Assistant Secretary for Environmental Restoration and Waste Management are different from those of the Assistant Secretaries for Defense Programs and Nuclear Energy.
- ES&H 5-year plans. Each assistant secretary must have a plan of action to address ES&H deficiencies, but each is providing separate guidance and requiring different formats, reporting, budget detail, schedules, and priorities.

- ES&H corrective action plans. The corrective actions priority scheme required by the Assistant Secretary for Health is different from that of the Assistant Secretary for Environmental Restoration and Waste Management.
- Budgeting. When formulating and preparing cost estimates, each assistant secretary uses different formats, priorities, and terminology.

The 1989 National Academy of Sciences report also discussed problems in DOE's order system, noting that there is a need to strengthen the process by which orders are promulgated.

A 1993 study by the Massachusetts Institute of Technology (MIT) found these same conditions prevalent through DOE. MIT's study was based on extensive interviews with DOE managers and contractors.[3] The authors reported that the many conflicting and redundant orders are not integrated among headquarters offices and that their clarity, usefulness, and utility are not properly balanced between detail and policy direction.

Despite the large amount of DOE headquarters' guidance, confusion persists regarding DOE policies. For example, a published summary of Tiger Team results reported that 80 percent of facilities assessed "did not provide clear, adequate, and/or correct guidance to the contractor on mandated DOE programs and/or orders."

Without better headquarters efforts to coordinate and integrate compliance with orders and other DOE directives, DOE executives will continue to face significant barriers to their effective implementation of SEN6.

DOE's Task Force on Directives Could Alleviate Confusion

DOE's complicated, formal system of providing guidance and direction to field offices and contractors is cause for many communication problems. As we described above, DOE orders, directives, and notices can be contradictory, conflicting, overlapping, and onerous to field offices and contractors. Our interviews and past reports have uncovered many examples of problem orders. These orders are not coordinated at headquarters, and each PSO and administrative office can issue a binding DOE order. Nor are orders evaluated for their cost effectiveness. Furthermore, contractors and field offices alike state that they are given limited time to comment on draft orders before they become final.

[3]Making Progress in Cleaning Up DOE's Weapons Complex: Issues of Organization and Management, MIT-E193001, Jan. 1993.

The Secretary, aware of the seriousness of these problems in the communications system, created an internal task force to improve it. This task force is to find solutions that might lead to better coordination and integration of direction to the field offices and contractors. The task force is also studying the need for new procedures to develop orders that take into account cost effectiveness and timeliness. We believe that the task force's activities are important and could lay the groundwork for improved communication throughout DOE and among its contractors.

Communications Problems Are a Major Obstacle

Throughout our structured interviews, we heard about the need for improved communication in DOE. In the absence of comprehensive and well-coordinated systems to direct agency actions, effective communication is a key to making any organization function efficiently. Executives in the field and headquarters offices alike argued for more effective communication between and among their units and the PSOs. For example:

- According to a field office director, "communication between Environmental Management, Defense Programs, and the Office of Policy is limited" in headquarters. From a Washington perspective, the problem seems just as pervasive. "DOE is full of fiefdoms," several executives said. "Communications and teamwork do not exist."
- A deputy assistant secretary stated that "internal communication when shared becomes an obstacle to understanding," as when "Nuclear Energy and Defense Programs say 'advanced neutron source' when they really mean 'reactor.'"
- As a field manager views the problem, "Program Secretarial Officers don't coordinate or communicate, even within their own organizations . . . . Horizontal communication is infrequent, and when it does happen, is usually antagonistic and adversarial. With eight PSOs there are eight different perceptions of the site mission."
- "The labs have no formal mechanism for communication," a laboratory official said. Indeed, most participants praised the laboratory directors' "summit" meeting held in December 1991 as a positive step toward improving communication with DOE headquarters and with one another. One official said that the meetings at the summit were the first time he had seen effective communication in DOE in 23 years.

These comments were echoed by dozens of senior officials throughout DOE's headquarters, field offices, and laboratories. At a time when many

organization and mission changes are under way, effective communication should be at a premium in the Department.

The new Secretary believes, as do several field office managers who commented on a draft of this report, that her new reporting relationships address many of DOE's internal communication problems. We believe that the new Associate Deputy Secretary for Field Management has an opportunity to become an important point of contact for coordinating priorities and resolving the many conflicts that exist between various assistant secretaries. We also believe this role will press the Associate Deputy Secretary to the limits of his or her ability to achieve these goals.

Strengthening Contractor Accountability and DOE Oversight

A second area of management change that is important to the success of DOE involves making contractors more accountable to DOE and making DOE's oversight of contractors more effective. Perhaps no other activity has DOE under such intense outside scrutiny as its traditional (and intentional) lack of control over contractors. Many reports, by GAO, the Inspector General, and others, have documented contractor inattention to the physical and environmental conditions of the nuclear weapons complex, accompanied by DOE's poor oversight of contractors' activities. Behind these problems are the cost-reimbursable contracts used by the government since the early AEC days. DOE's contractors have little incentive to be cost-effective when the government pays all expenses and assumes nearly all risk. In addition, DOE lacks the resources to carefully monitor contractor activities and lets the contractors deviate from standard procurement clauses. National security secrecy about contractor operations—along with contractors' past exemption from many state and federal environmental protection statutes—have traditionally shielded contractors, and DOE, from outside scrutiny.

DOE has made changes in its field-contractor relationship in order to improve contractor performance. At the same time, efforts are under way to better equip DOE managers with more effective tools for oversight. The success of these efforts is limited, however, by the lack of information and resources with which to adequately manage new contracting changes and by severe problems with DOE's staff capabilities (discussed later in this appendix).

DOE has recently made a variety of adjustments to contract practices. These include providing incentives to encourage contractors' adherence to

ES&H criteria and employing new rules that hold contractors liable for costs that could have been avoided by proper performance.

Perhaps the most significant contract management change is DOE's implementing a "work authorization system" throughout the nuclear weapons complex. Under this arrangement, also referred to as "task order contracting" (TOC), contractors and DOE will jointly negotiate contracts on a task-by-task level, with contractors needing authorization from DOE before specific work can be performed. Historically, DOE contractors operated under a general budget approved at the beginning of each year. Contractors could then draw from a line of credit as costs accumulated, with little tie-in to approved budgets. Because DOE believed this arrangement needed more specificity to better control contractor activities, it launched task order contracting. Under this new approach, the contractor's budget is broken into specific tasks that require negotiation with DOE on costs, milestones, and performance "deliverables." New contracts will employ this approach, and old contracts were beginning to be converted in late 1992. We believe TOC, as well as other measures, hold promise for giving DOE managers leverage in their dealings with contractors while also providing the contractors with more specific expectations from DOE.

These kinds of changes are a welcome trend in DOE's contract management philosophy. As one senior headquarters manager told us, DOE should be funding contractor "results," not just "effort." The new Secretary of Energy also acknowledges improvements are still needed in contract management and oversight and has begun implementing additional initiatives, including new procedures to better control certain contractor costs and creating a "Contract Reform Team" to review contracting mechanisms and practices.

Management System Weaknesses

Despite such promise, we are concerned that field offices do not have effective means to implement these contract changes, particularly TOC. The quality of information on contractor activities—that is, the ability to evaluate contractor cost estimates and contract changes on a task level—is insufficient in many parts of the complex. Business systems, although improving, are not yet able to support TOC. The current situation is best expressed by what DOE's largest field office, responsible for overseeing 40 percent of the weapons complex, reported in its 1992 self assessment:

"The [Albuquerque Field Office] does not currently have the personnel resources or management systems to fully support the program management, contract administration or financial management requirements associated with this new contracting approach."

Furthermore, the report noted, the field offices' current financial reporting capabilities "cannot provide the financial data required to support the Secretary's Task Order Contracting Initiative."

As a result of system weaknesses, the risk is high that DOE's new contract management changes may actually cost more to implement, without giving the Department the greater control it requires. Officials in the field offices we interviewed expressed great concern about the uncertainty surrounding TOC and its likely effect on work load, flexibility, and monitoring of contractors on a task level. Most officials foresee a tremendous increase in the work load required to administer contracts, given the number of tasks to be negotiated and the likely changes needing further negotiation throughout the operating year. Some are concerned that field officials will be "overwhelmed" by the paper work burden, having the effect of government's hands being "tied." Others are concerned that without the ability to evaluate contractor cost proposals, and their basis for changes, DOE will not be in a position to challenge costs or evaluate performance. The result could be higher costs to the government and higher fees to contractors. In fact, early results show that contractors are earning substantially increased fees without showing a corresponding increase in their performance. This situation arises because the contractors' "fee pools" have been increased to reflect their increased risk under new contracting rules and to adjust for inflation. However, their risk is limited to breaking even, so that unless DOE is more diligent in overseeing contractors (and has the proper information with which to oversee activities), contractors will be virtually guaranteed that their income will increase from operating DOE facilities.

Departmental procurement officials advised us that it will take 5 years to develop management systems and training to properly implement TOC, which includes time needed to learn and gain experience with the system and to develop procedures that provide detailed data (including cost estimates) and management information at a useful level of detail. All field offices were expected to begin implementing TOC or an equivalent approach by October 1992.

DOE executives have similar concerns about the probable effects of the new accountability rule, which is designed to hold contractors

accountable for improper costs. Until DOE and its contractors develop the ability to generate data to support detailed and timely evaluations, some managers believed that the new rule can do little to increase contractor accountability.

Past GAO reports support these concerns. For example, we recently concluded that DOE lacks the objective information needed to properly evaluate contractor award fees.[4] We also found that managers in headquarters and the field have widely varying interpretations of the same information, further supporting the need for more objective information on contractors' performance.[5] DOE's current efforts to comprehensively evaluate departmental and contractor business systems—in preparation for TOC—will help managers throughout the complex to identify and correct weaknesses in their systems.

Building Staff Capability

Perhaps the most challenging and fundamental issue facing DOE is developing a competent work force to direct and oversee its contractors. Managers reported to us that DOE lacks sufficient staff who are proficient in skills ranging from contract administration to hazardous waste cleanup. More than 60 percent of the senior managers we interviewed cited work force problems as barriers to fulfilling their missions. As newer missions overtake old ones, and as recent initiatives call for stronger DOE oversight, the need for a skilled work force is a critical—but still missing—component.

More-Skilled Work Force Needed

Many managers advised us that the desire by DOE to improve its direction and oversight of contractors is not likely to succeed without a more-skilled work force. Outside groups that have studied DOE expressed similar concerns. A 1990 summary of DOE's internal Tiger Team reviews also discussed basic and persistent weaknesses in staff capabilities:

"[Field offices] provide insufficient oversight of contractor activities. Major difficulties exist in obtaining sufficient numbers of staff with appropriate qualifications to carry out program activities in a manner which will ensure full compliance with ES&H requirements."

[4]Energy Management: Tightening Fee Process and Contractor Accountability Will Challenge DOE (GAO/RCED-92-9, Oct. 30, 1991).

[5]Nuclear Health and Safety: Increased Rating Results in Award Fee to Rocky Flats Contractor (GAO/RCED-92-162, Mar. 24, 1992).

In a 1992 internal study on the status of safety and health programs in the Hanford Site in Washington State, DOE noted that several weaknesses in management practices continue to be a problem, including "insufficient staff with expertise in occupational safety and health in the [DOE field office] and its contractors." Hanford contains some of DOE's biggest contamination problems.

Several field offices cited staffing weaknesses in their recent self assessments. For example:

- "Limited manpower . . . has resulted in high compliance risks which could result in enforcement actions by the regulatory agencies . . . [and also] leads to inadequate assessment of impacts of changing environmental regulations and DOE orders . . . [that] could lead to non-compliance with regulations."
- "A long-term weakness has been the need for additional staff, adequately trained, to provide for improvement in contractor over sight . . . . This has necessitated a high level of dependence on support service contractors . . . . Additional staffing is necessary for the increased safety and health oversight of the M&O contractors, which has been recognized as an area requiring corrective action . . . . Staffing shortages have been the root cause of problems in financial management, project management and program management."
- "This office was unable to staff critical technical and engineering positions with the expertise necessary to carry out oversight of new and emerging programs."
- To cope with staffing shortages, some field offices are "forced" to contract out part of their oversight responsibilities. "Because of limited federal staffing, more and more support services contracts are being awarded to support [our] missions. Insufficient Federal staff has led to the use of M&O contractor personnel to assist [us] in performing prime contract management responsibilities. The use of M&O contract personnel to assist in performing these functions has raised several procurement integrity concerns."

Many other internal and external DOE studies have come to the same conclusions. For example,

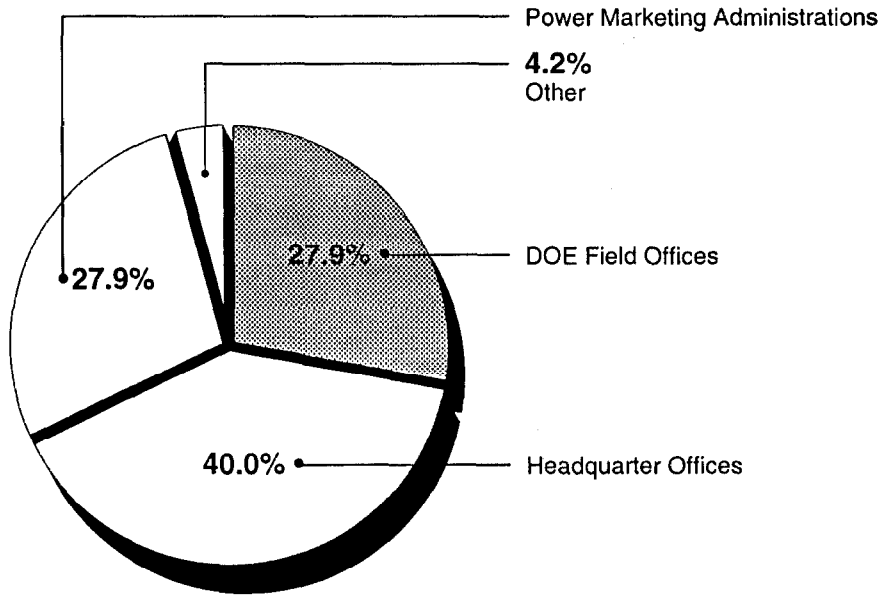
- Under the Federal Managers Financial Integrity Act, all of DOE's major field offices reported to headquarters that staffing deficiencies are a material weakness requiring remedial action.

- DOE's CFO reported to senior managers that the failure of field offices to staff field CFO offices threatens the Secretary's goals of improved financial oversight of contractors. Field offices responded by stating they lack resources to fully staff field financial positions. For example, the Albuquerque field office has only 4 of the 11 accountants assigned to review 7 contractors accountable for $4.1 billion in federal budget expenditures.
- DOE offices that lack staff report being obliged to rely on support-service contractors in order to complete tasks that should be performed by federal employees. Managers complain about the added cost of using contractors in some situations, the loss of in-house expertise, and the situations that would pose conflicts of interest.

The 1993 MIT study also uncovered staffing problems. Regarding human resource issues, it reported that the most-often-mentioned category of concern was the competence and expertise of current staff. The study also observed that the shortage of qualified talent at headquarters aggravates the problems of developing appropriate DOE orders and directives. Other external reports cite similar concerns. For example, the 1991 report by the Advisory Committee on Nuclear Facilities Safety noted that DOE is "weakened in talent," and in its September 1992 report, the Defense Nuclear Facilities Safety Board noted, "the Board recognizes that the shortage of qualified technical talent at DOE has been longstanding." In its January 1993 response to this recommendation, DOE cited ongoing progress and the underlying principles behind the reorganization as evidence of DOE's continuing responsiveness to Defense Nuclear Facilities Safety Board (DFNSB) concerns.

Figure II.1 illustrates the problems DOE faces. About 28 percent of the DOE work force, or roughly 5,500 DOE staff, are positioned in the field to oversee a contract work force of more than 149,000. While DOE has increased its staffing by 2,900 positions since 1990, contractor staff is growing because of the increased budget for environmental cleanup. Because of increases in the contractor population, the ratio of DOE employees to contract employees has increased slightly between 1990 and 1992.

Figure II.1: Where DOE Staff Were Located in 1992



In a notice to his senior managers, Secretary Watkins emphasized rebuilding the DOE staff capability, stating that "the lack of coherent effort to recruit, train, and develop the technical talent within DOE to run our complex operations is one of the Department's most serious problems. Correcting these deficiencies is one of my highest priorities."[6]

Unfortunately, achieving this important goal is proving to be elusive. Many barriers impede its success. For example, one of the Secretary's initiatives, creation of the Office of Scientific and Technical Recruitment, has not been well supported by DOE's senior management. Few headquarters managers we interviewed praised the initiative; most did not use the new office; and some managers were not even aware that the office existed. The office developed a course on facility operations, but it did not prepare comprehensive training programs and was eventually disbanded.

DOE Lacks Effective Work Force Planning

DOE lacks a comprehensive strategy to address its work force weaknesses, one in which staff needs are assessed and action plans developed to meet

[6]Secretary of Energy Notice (SEN-6E-92), Feb. 21, 1992, p. 11.

those needs. Recognizing these deficiencies, in early 1992, DOE approved a 5-year plan for the "recruitment, training and professional development of technically trained individuals to staff DOE line and oversight offices at all levels of the organization." Designed to "raise the technical competence of the DOE work force, the plan provided the following:

- a steering committee to oversee plan initiatives,
- a project to analyze and describe mission-critical work activities and training needs, and
- the concept for a DOE training facility (scheduled to open in late 1993).

Although not comprehensive, the plan covers major operating elements of DOE and is a positive step forward.

Recognizing that existing staff must be better utilized, an internal DOE task force reported in late 1992 that the Department lacks an effective process for allocating staff resources, noting further that the Secretary needs to define priorities more precisely so that staff can be deployed in areas where needs are most urgent. It also found that leadership needs to articulate overall departmental priorities to guide decisions on redeployment of staff and recommended that DOE not seek additional staff until, in essence, it had developed a "comprehensive long-term corrective strategy."

GAO believes effective work force planning is essential to meeting critical and changing mission needs. Good planning is especially important during periods of tight budgets and limited work force growth.

The Importance of Building an Effective Management Structure

The importance of building an effective management structure in DOE is underscored not only by its current problems but also by the significant responsibilities facing the Department over the long term. Many of DOE's issues will not be resolved for generations—a situation rare in governmental affairs. That is, DOE officials are being called upon to make decisions whose effects they will not experience. For example:

- In nuclear waste management, some of the facilities scheduled for cleanup were first contaminated half a century ago and may not be safely disposed of for another half century. Nuclear waste from civilian reactors will not be sent to a final depository until 2010, at the earliest. Testing at the Waste Isolation Pilot Plant in New Mexico will continue to at least 2010 before commitments can be made to permanently bury military wastes.

- In nuclear research and technology, work on another, safer generation of reactors to generate electricity will extend into the next century; the Superconducting Super Collider may not operate for at least another decade; and plans for a fusion commercial plant—the 1991 National Energy Strategy's only specific goal—is scheduled for after 2040.
- Science and research programs include not only extensive traditional physics and biology but also projects as elusive as cold fusion and as ambitious as a computer "mapping" of the 100,000 genes in the human genome that will take decades.
- U.S. energy policy, considered the principal mission at DOE in the 1970s, must be redefined over the coming decades and balanced with the Department's—and the country's—growing responsibilities for environmental restoration.

These many undertakings require billions of dollars in taxpayer investment and significant government involvement in program management and oversight for decades to come.

Objectives, Scope, and Methodology

Our objective was to identify how DOE can make and sustain management improvements to strengthen policy development, better achieve program initiatives, improve the integrity of management support systems, and enhance planning for future energy issues.

Because of the size and complexity of DOE, we focused principally on those parts of the organization that dominate DOE's current missions: the nuclear weapons complex, the national laboratories, and environmental cleanup. However, our in-depth structured interviews, described in more detail below, covered all parts of the Department.

To assess DOE's current and future challenges, we examined a wide range of past reports on DOE programs and energy issues from us, the Inspector General, other congressional agencies, and outside reviewers. We examined all DOE Tiger Team assessments and business systems reviews performed through mid-1992. We also interviewed many outside specialists, including noted energy experts and former senior DOE officials.

In addition, we conducted structured interviews with 174 senior managers in DOE headquarters, field offices, and laboratories. We also held discussions with DOE contractors. To evaluate DOE's current initiatives, the structured interviews included all assistant secretaries and their principal deputies or other senior managers, all field office managers and many of their assistant managers, and all laboratory directors and many of their assistant directors at all 9 multiprogram labs. The structured interviews were administered between December 1991 and February 1992. The focus of the interviews was on current management initiatives as defined by DOE in the following documents: (1) the Secretary's 10-point management plan and (2) DOE's recent submissions to the President as required under the Federal Managers Financial Integrity Act. By analyzing the Department's own initiatives, we were able to focus on just those problems that DOE itself considers most serious, adding, where appropriate, our own perspectives and those of outside review groups.

We conducted our work between December 1991 and May 1993. We briefed the Secretary and members of her staff on May 25, 1993, on the results of this report. Several DOE officials also provided written comments on a draft of this report. We made changes as appropriate in response to their comments. We had previously briefed the former Deputy Secretary and the Under Secretary on parts of this report in July and August 1992. Our work was conducted in accordance with generally accepted government auditing standards.

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