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Clearer Missions and Better
Management Are Needed at
the National Laboratories

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Mr. Chairman and Members of the Subcommittee:

We are pleased to testify on the changing missions of the Department of Energy (DOE) national laboratories and their management. In the past we have reported on how improved management is needed if DOE and the laboratories are to successfully meet new mission responsibilities. The information included in this testimony is drawn from our past work on DOE's national laboratories, contract reform, and other issues.¹

In summary, Mr. Chairman, despite a consensus on the need to sharpen the laboratories' focus and improve DOE's management of them, achieving these goals has been elusive. DOE currently manages the national laboratories program by program, not laboratory by laboratory or as a coordinated research system with diverse objectives. Major new efforts in such areas as stockpile stewardship and major research projects—projects that heavily involve laboratories—will require significant improvements in how DOE and the laboratories are managed. Past frustration over the laboratories' loss of mission focus and management weaknesses has led some experts to suggest alternatives, such as privatizing them or developing quasi-governmental entities to oversee their missions and activities. While the lack of consensus on what the laboratories should do has made fundamental changes hard to achieve, some changes are occurring in laboratory management. Nevertheless, the challenges facing the Department—in important areas such as managing the stockpile stewardship program—raise concerns about how effectively DOE can manage these new initiatives given their past weaknesses in project management. The Government Performance and Results Act offers a framework to achieve fundamental change.

Before discussing these issues in more detail, we would like to provide some background on the national laboratories.

Background

DOE manages the federal government's largest research and development system, consisting of about 30 laboratories, with about 58,000 employees and operating budgets of about \$7.5 billion annually. Nine of these are multiprogram national laboratories that account for about 70 percent of DOE's laboratory budget. DOE estimates that it has invested more than \$100 billion in all of its laboratories over the past 20 years. Most of DOE's multiprogram national laboratories were established during or just after World War II as part of the Manhattan Project, which developed the

¹See Related GAO Products at the end of this testimony.

world's first atomic bombs. These national laboratories have since expanded their missions to encompass civilian research and development in many disciplines—from high-energy physics to advanced computing to human genetics. DOE owns the laboratories but contracts with universities and private-sector organizations for their management and operation. Nearly all of DOE's national laboratories are operated by nonprofit institutions.

Laboratory Missions

The nine national laboratories are an important national resource, having made significant contributions in a variety of scientific disciplines. However, they have also expanded their original missions and suffer many management weaknesses. In prior work on the national labs, we found that:

- DOE had not ensured that work at the national laboratories was focused and managed to make maximum contributions to national priorities.
- DOE had not established clear missions for the laboratories or developed a consensus among laboratory and government leaders on the laboratories' appropriate missions in the post-Cold War environment. The laboratories' missions are set forth as broad goals and activity statements rather than as a coordinated set of objectives with specific implementation strategies for bringing together the individual and collective strengths of each facility to meet departmental and national priorities.

DOE exacerbated this problem by treating the laboratories as separate entities, rather than as a coordinated national research system with unified goals. We believe the lack of proper departmental mission direction was compromising the laboratories' effectiveness in meeting traditional missions and their ability to achieve new national priorities. DOE currently manages the national laboratories program by program, not laboratory by laboratory or as a coordinated research system with diverse objectives. This approach prevents the laboratories from fully capitalizing on one of their great strengths—combining multidisciplinary talents to solve complex, cross-cutting issues. For example, research on preventing the proliferation of nuclear weapons requires combining expertise in nonproliferation and weapons design—activities that are carried out by different labs and managed by different assistant secretaries at DOE. The laboratories themselves believed that better linkages are also needed among the energy conservation, fossil fuel, and nuclear energy research areas.

We, along with others, have reported that DOE's management approach has impeded the laboratories' ability to achieve their goals and administrative responsibilities. The guidance and direction from DOE offices was not always consistent, and laboratories are forced to meet similar requirements from many different offices. For example, we found that laboratories were subjected to hundreds of reviews annually, ranging from program evaluations to compliance reviews on administrative requirements. DOE has been slow in setting priorities for compliance with its environmental requirements, forcing the laboratories to treat each requirement as equally important. Consequently, DOE had no assurance that the laboratories address more pressing concerns first, or with enough attention. As a result, laboratory officials were kept from managing their research in the most effective manner, according to many experts.

Over the past several years, many government advisory groups have also urged DOE to clarify its laboratories' missions and improve their management. For example:

- In 1983, the White House Science Council Federal Laboratory Review Panel issued a report (commonly known as the Packard Report) about all federal research and development laboratories. It found that while DOE's laboratories had defined their missions for part of their work, most activities were fragmented and unrelated to the parent agency's policies.²
- In 1992, DOE's Secretary of Energy Advisory Board found that the broad laboratory missions, coupled with rapidly changing world events, had "... caused a loss of coherence and focus at the laboratories, thereby reducing their overall effectiveness in responding to their traditional missions as well as new national initiatives. . . .adding that DOE and its laboratories suffered the. . . .lack of a common vision as to the missions"³
- A 1993 report by an internal Energy Department task force on laboratories reported that their missions "must be updated to support DOE's new directions and to respond to new national imperatives"⁴

²Report of the White House Science Council, Federal Laboratory Review Panel, Office of Science and Technology Policy, May 15, 1983.

³Secretary of Energy Advisory Board, Final Report, 1992.

⁴Changes and Challenges at the Department of Energy Laboratories, Final Draft Report of the Missions of the Laboratories Priority Team, 1993.

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- The 1995 Galvin Task Force—the latest of these initiatives—called for a more “disciplined focus” for the national labs and also reported that the labs may be “oversized” for their role.⁵
 - The Interagency Federal Laboratory Panel, chartered by presidential directive in 1994, has been examining all federal laboratories, including DOE’s. The panel’s March 1997 report noted that “none of the agency strategic plans, however, includes a clear and specific vision describing the role and nature of that agency’s laboratory system—the ‘end point’ of reform—in sufficient detail to guide its evolution.” In addition, the panel noted that “continuing micromanagement of the laboratories impedes progress, particularly at DOE.”

Current Management Issues Facing the National Labs

As DOE contemplates the future missions of the national laboratories, a variety of management issues will require its full attention. DOE struggles to manage big projects successfully, is slow to reap the benefits of its own contract reforms, and continues to face recurrent problems as it manages the laboratories through its complex organizational structure.

DOE’s success with managing big projects is not outstanding. From 1980 through 1996, DOE conducted 80 projects that it designated as “major system acquisitions” (MSAs), which are its largest and most critical projects, ranging in cost from \$100 million to billions of dollars. Many of these projects were managed directly by the laboratories. As of June 1996, 31 of the projects had been terminated prior to completion after total expenditures of over \$10 billion. Only 15 of the projects were completed, and most of them were finished behind schedule and with cost overruns. Furthermore, 3 of the 15 completed projects have yet to be used for their intended purposes. The remaining 34 projects continue, many with substantial overruns and “schedule slippage.”

We believe there are four key factors underlying the cost overruns, schedule slippage, and terminations of DOE’s largest projects:

- DOE’s constantly changing missions often make it difficult to maintain departmental and congressional support for these long-term, high-cost projects.
- The MSAs’ incremental, annual funding subjects them to potential delays or terminations in each year.

⁵Alternative Futures for the Department of Energy National Laboratories, Secretary of Energy Advisory Board, Task Force on Alternative Futures for the Department of Energy National Laboratories (Feb. 1995).

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- A flawed system of incentives does not always reward individuals and organizations for “doing the right thing” and has often rewarded contractors despite poor performance.
 - DOE has difficulty in hiring, training, and retaining enough people with the requisite skills to provide effective oversight and/or management of contractors’ operations.

Many of these problems stem from DOE’s longstanding weak contract management. Proper oversight of its 110,000 contractor employees, who perform nearly all of the Department’s work, has never been easy. Historically, these contractors worked largely without any financial risk, were paid even when performing poorly, and enjoyed a management policy of “least interference” by DOE and its predecessor agencies. DOE is now reforming its contracting practices to make them more business-like and results-oriented. While we believe that these reforms are generally a step in the right direction, at this time we are unsure whether the Department is truly committed to fully implementing some of its own recommendations. For example, despite the change in DOE’s contract award policy from sole source to one favoring full and open competition, DOE decided to extend, rather than compete, its \$2.3 billion contracts with the University of California to operate three laboratories. Furthermore, DOE may have weakened its negotiating position when it conditionally decided to extend these three contracts before negotiating the contract terms. Also, through mid-1996, DOE chose to extend 12 contracts that have never been competitively awarded, including those for Argonne National Laboratory and Ames Laboratory, whose contractors have been in place continuously since 1946 and 1943, respectively. In another example, some problems have arisen in DOE’s implementation of performance-based contracting, which is a key component of contract reform, according to the Department. For example, the fees that the Brookhaven National Laboratory could earn are not linked to performance.

DOE continues to miss the benefits of competition, which is a major feature of its much-promoted contract reform effort. While DOE has changed its policy and adopted competitive contract awards as the new standard for its management and operating contracts, in practice, DOE continues to make noncompetitive awards. Of the 24 decisions to award new management and operating contracts between July 1994 and August 1996, DOE noncompetitively awarded 16 of them.

Findings from DOE’s Office of Oversight (under the Assistant Secretary for Environment, Safety and Health) raise old concerns about how DOE

manages its laboratory contractors. Reports conducted since 1996 from this office on three major DOE laboratories (Los Alamos National Laboratory, Brookhaven National Laboratory, and the Idaho National Environment and Engineering Laboratory) show that DOE's chronic management problems continue. Each laboratory points to new or recently implemented programs that, given time, may correct the problems. But taking a historical perspective, these "corrective" programs are implemented, then are overtaken by events or management changes, then other corrective programs are implemented in a seemingly unending succession. The end result is that the original problems are never fully resolved. The main problems continue to be confusion about responsibilities; confusion about which regulations and/or guidelines apply; inadequate management attention to environment, safety and health issues at the contractor and subcontractor levels; and inadequate DOE oversight of contractor operations. We and others (including DOE's Inspector General and the Defense Nuclear Facilities Safety Board) have identified these problems repeatedly over the years.

New challenges await DOE as it prepares to orchestrate its ambitious Stockpile Stewardship and Management Program, a \$4.5 billion a year enterprise to test and maintain nuclear weapons without conducting explosive tests. Laboratories will have an integral role in the program. With no underground nuclear testing, and no new nuclear weapons designs, DOE expects existing weapons to remain in the stockpile well into the next century. This means that the weapons will age beyond original design expectations and DOE believes an alternative to underground testing must be developed to verify the safety and reliability of the weapons. This program includes a multimillion-dollar a year Accelerated Strategic Computing Initiative, involving three different manufacturers as well as three laboratories in a plan to integrate supercomputing facilities from distant sites.

DOE and the Congress should pay close attention to how this costly and complex program is being managed in light of DOE's past problems in managing similar programs. For example, DOE is responsible for managing the nation's nuclear weapons stockpile, including providing surveillance of weapons currently in the stockpile. DOE provides three types of stockpile surveillance tests—flight tests, nonnuclear systems laboratory tests, and nuclear and nonnuclear component tests—on nine types of nuclear weapons. DOE has been behind schedule in conducting flight tests on three types of weapons and in conducting laboratory tests on one type of weapon and most of its key components (in some instances, several years

behind). Reasons for the delays include the suspension of testing at one facility because it lacked an approved safety study required to disassemble and inspect one type of weapon, and at another facility because of concerns about safety procedures. We found that DOE lacked written plans needed to put testing programs back on schedule, and several factors could cause further delays. These factors included the possible expiration of required safety studies, future limitations on the number of flight tests, and the lack of contingency plans in the event a test facility is shut down.

Opportunities for Improvement

DOE has several initiatives under way that it believes address mission and management problems raised by us and by others. For example, DOE believes its strategic planning process provides the framework for more focused missions for the laboratories. It also established the Laboratory Operations Board in 1995 to provide mission focus and management attention on the national laboratories. The Board published a strategic plan for the laboratories with more reports to follow. The Board also points to the laboratories' significant productivity gains and to streamlined systems in DOE to help improve management.

DOE also believes that reforming its contracts, specifically by introducing performance measures to guide and evaluate the laboratories' activities, will form a basis for a more productive management approach that better integrates the laboratories' missions.

We generally agree that these initiatives have some potential for helping DOE to refocus the missions of the laboratories and improve their management. However, these initiatives have not yet been implemented, or in the case of contract reform, will take years to be fully operational. The recent reviews by DOE's Office of Oversight mentioned earlier, however, suggest that considerably more attention is needed before these reforms can be judged totally successful. Thus, their outcome, while initially promising, is very uncertain.

We also caution that in the past, DOE has introduced planning systems and reorganized many times—all without significant success. Additionally, as we noted earlier, previous advisory groups have recommended that DOE refocus the laboratories' missions and improve its management of them, yet the Department has failed to achieve fundamental change.

The lack of long term, fundamental change in DOE has prompted some experts to suggest alternatives to how DOE's national laboratories are

managed. For example, to sharpen focus and improve management, the Galvin Task Force suggested creating private or federal-private corporations to manage most or all of the laboratories. Under this arrangement, nonprofit corporations would operate the laboratories under the direction of a board of trustees that would channel funding to various laboratories to meet the needs of both government and nongovernment entities. DOE would be a customer, rather than the direct manager of the laboratories. Although the task force provided few details about how such an alternative structure would be developed and implemented, its proposal raises important issues for DOE and the Congress to consider, such as (1) how to monitor and oversee the expenditure of public funds by privately managed and operated entities; (2) how to continue the laboratories' significant responsibilities for addressing environmental, safety, and health problems at their facilities, some of which are governed by legal agreements between DOE, The U.S. Environmental Protection Agency, and the states; and (3) how to maintain federal access to facilities so that national priorities, including national security missions, are met.

In addition, other organizational options that have been proposed by experts include the following:

- Convert some laboratories, particularly those working closely with the private sector, into independent entities.
- Transfer the responsibility for one or more laboratories to other agencies, whose responsibilities and mission are closely aligned with a particular DOE laboratory.
- Create a "lead lab" arrangement, under which one laboratory is given a leadership role in a mission or technology area and other laboratories are selected to work in that area.
- Consolidate the responsibility for research, development, and testing on nuclear weapons within a single laboratory.

Each of these alternatives has advantages and disadvantages, as does the Galvin Task Force proposal, and needs to be evaluated in light of the laboratories' capabilities for designing nuclear weapons and pursuing other missions of national and strategic importance. Furthermore, the government may still need facilities dedicated to national and defense missions, a factor that would heavily influence any future organizational decisions.

Some policymakers have suggested that as an alternative to the current DOE laboratory structure, the laboratories should be uncoupled from DOE

and placed under other agencies or privatized where warranted. The proposals mostly stem from discussions about dismantling DOE. Changing mission focus—coupled with DOE's long-standing management difficulties—has prompted reevaluating of DOE as an institution. In this context, experts we consulted in a 1994 survey—which included several former Secretaries of Energy—suggested that DOE's laboratories could be placed in other entities if DOE were dismantled. For example, many respondents suggested moving DOE's basic research functions to the National Science Foundation, the Commerce or Interior departments, other federal agencies, or a new public-private entity. Some also suggested that some multiprogram national laboratories could move to other federal agencies, or share their missions with other agencies. A more complicated issue is the placement of the defense laboratories—Lawrence Livermore, Sandia, and Los Alamos—whose responsibilities include important national defense responsibilities.

Dismantling DOE would likely lead to other problems. Federal agencies are willing to accept functions but not employees, for doing so may add to the risk of a reduction-in-force. Transferring functions with an elaborate field structure — such as DOE's — can be very expensive. And, unavoidably, transferred functions could duplicate existing ones.

The Government Performance and Results Act Offers a Framework for Focusing the National Laboratories' Missions and Management

A past roadblock to achieving consensus on the laboratories' missions has been the absence of a framework within which policymakers, including the Congress, could focus attention on mission and management issues. The Government Performance and Results Act of 1993 (Results Act) provides such a framework. The Results Act requires agencies to implement meaningful measures of output, and to use assessments of productivity and quality in combination with measures of efficiency and cost reduction to characterize the progress of reform. Each agency and laboratory would be expected to have some customized performance measures appropriate to its missions, but not necessarily applicable or useful to other agencies and laboratories. While agencies are just now completing their early strategic plans, and it is too soon to fully evaluate the results, the Results Act process provides an opportunity for debating the future of the laboratories. In our recent examination of DOE's draft strategic plan, we found that while DOE has been actively pursuing the objectives of the Results Act, its draft plan had several deficiencies. For example, the plan failed to spell out the relationship between long-term goals and the annual performance goals, key factors external to DOE, and the effect of program evaluations on the development of strategic goals.

This is important because such linkages show how missions will be translated into actual strategies throughout the organization—an important component of the Results Act process that could guide how laboratories are to be used and evaluated. We are now in the process of reviewing DOE's September 1997 plan.

Mr. Chairman, this concludes my statement. I would be happy to respond to any questions from you or members of the Subcommittee.

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Related GAO Products

Results Act: Observations on the Department of Energy's Draft Strategic Plan (GAO/RCED-97-199R, July 11, 1997).

Department of Energy: Contract Reform Is Progressing but Full Implementation Will Take Years (GAO/RCED-97-18, Dec. 10, 1996).

Department of Energy: Opportunity to Improve Management of Major System Acquisitions (GAO/RCED-97-17, Nov. 26, 1996).

Nuclear Weapons: Improvements Needed to DOE's Nuclear Weapons Stockpile Surveillance Program (GAO/RCED-96-216, July 31, 1996).

Department of Energy: A Framework For Restructuring DOE and Its Missions (GAO/RCED-95-197, Aug. 21, 1995).

Department of Energy: National Laboratories Need Clearer Missions and Better Management (GAO/RCED-95-10, Jan. 27, 1995).

Department of Energy: Challenges to Implementing Contract Reform (GAO/RCED-94-150, Mar. 24, 1994).

Federal Research: Information on Fees for Selected Federally Funded Research and Development Centers (GAO/RCED-96-31FS, Dec. 8, 1995).

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