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DEPARTMENT OF
ENERGY

Improving Management of
Major System Acquisitions

Statement by Victor S. Rezendes,
Director, Energy, Resources, and Science Issues,
Resources, Community, and Economic
Development Division



Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to discuss the Department of Energy's (DOE) performance in completing its largest and most significant projects, which are referred to as major system acquisitions. As you know, DOE considers these projects critical to fulfilling its mission. The projects are also extremely costly and can be politically sensitive. Our testimony today will summarize our November 1996 report on DOE's management of its major system acquisitions.¹ Specifically, we will address (1) DOE's performance in completing its major system acquisitions; (2) the key factors that hinder the timely, cost-effective completion of the acquisitions; and (3) what is being done to improve DOE's performance.

In summary, from 1980 through 1996, DOE conducted 80 projects that it designated as major system acquisitions. Thirty-one of the projects were terminated prior to completion, after expenditures of over \$10 billion. Only 15 of the projects were completed, and most of them were finished behind schedule and with cost overruns.² Further, 3 of the 15 projects have not yet been used for their intended purpose. The remaining 34 projects are ongoing, many with substantial cost increases and "schedule slippage."

We believe there are four key factors underlying the cost overruns, schedule slippage, and terminations of DOE's most critical projects. These are unclear or changing missions; the incremental funding of projects; a flawed system of incentives both for DOE's employees and contractors; and a lack of sufficient DOE personnel with the appropriate skills to effectively oversee contractors' operations. On the positive side, DOE is implementing several initiatives that could help improve the Department's overall management as well as the management of individual major system acquisitions. We believe that their implementation offers DOE an excellent opportunity to address the key factors.

Before we discuss these problems in greater detail, we will briefly describe DOE's varied responsibilities and federal guidance on the management of major system acquisitions.

Background

Over the years, DOE has conducted technically complex activities at government-owned, contractor-operated facilities across the country.

¹Department of Energy: Opportunity to Improve Management of Major System Acquisitions (GAO/RCED-97-17, Nov. 26, 1996).

²Cost overruns are increases in a project's original cost estimates.

These activities have included developing and producing nuclear weapons; operating nuclear reactors, uranium enrichment plants, and plutonium production plants; performing research and development on both the military and civilian uses of nuclear energy; promoting and funding nuclear and other sciences; fostering energy conservation and efficiency; managing federal petroleum reserves; and, more recently, cleaning up environmental contamination resulting from its past operations. These activities have involved large-scale, first-of-a-kind projects requiring substantial construction and other expenses.

Office of Management and Budget Circular A-109, dated April 5, 1976, defined projects that are critical to fulfilling an agency's mission, entail the allocation of relatively large amounts of resources, and warrant special management attention as major system acquisitions. The circular requires that these systems receive top-level management review and an integrated approach to budgeting, contracting, and managing. In accordance with the circular, DOE designated many projects as major system acquisitions because of their high estimated costs (ranging from about \$100 million to many billions of dollars) and their perceived importance to fulfilling DOE's missions. From 1980 through 1996, DOE designated 80 projects as major system acquisitions.

DOE's Performance on Major System Acquisitions

As stated earlier, 31 of the 80 major system acquisitions that DOE conducted were terminated prior to completion, after expenditures of over \$10 billion. The projects were canceled for a number of reasons. In some cases, changing circumstances and/or world events simply caught up with the projects, and they were no longer needed. For example, because of the reduced demand for uranium enrichment services to fuel commercial nuclear power plants, DOE canceled the Gas Centrifuge Enrichment Plant after spending \$2.8 billion. Other projects were canceled because of changes in the administration's policy. For example, DOE canceled five coal demonstration plants, on which it had spent \$459 million, because the administration at that time did not believe that DOE should be funding demonstration projects. Because of anticipated reductions in nuclear weapons, DOE canceled a new tritium production reactor, after expenditures of \$1.2 billion.

In other cases, however, management problems and/or ineffective oversight by DOE led to large cost overruns and schedule slippage. Eventually, these problems led the Congress to terminate the projects. For example, we reported to the Congress that DOE's original cost estimate of

\$5.9 billion for the Superconducting Super Collider (a project intended to conduct high-energy physics experiments) had grown to \$8.3 billion; yet we identified additional known cost increases showing that the total cost would exceed \$11 billion.³ The Congress cut off funding for the project after a total expenditure of over \$2 billion.

Of the 15 projects completed, many incurred cost overruns and schedule slippage. Further, three have not yet been used for their intended purpose. For example, the Fuels and Materials Examination Facility at DOE's Hanford Plant was intended to fabricate and examine a full range of breeder reactor fuels. However, the facility has never been operated for its intended purpose because DOE's breeder reactor program was terminated in the early 1980s when the Congress cut off funding. The facility is now being used for storage and office space. DOE spent \$234 million on this project.

As of June 1996, at least half of the 34 ongoing projects were experiencing cost overruns and/or schedule slippage.⁴ For example, the estimated total cost for the Weldon Spring Remedial Action Project grew from about \$350 million to over \$850 million and the project is more than 5 years behind schedule. The Yucca Mountain Site Characterization Project's estimated cost has increased by more than \$1 billion and the project is more than 10 years behind schedule.

Factors Affecting DOE's Major System Acquisitions

We believe the high rate of cost overruns, schedule slippage, and terminations on DOE's major system acquisitions can be traced to four key factors:

- The constantly changing missions for DOE that often make it difficult to maintain departmental and congressional support for these long-term, high-cost projects.
- The funding of projects incrementally, from year to year rather than up front, which subjects the projects to potential delays or terminations in funding each year.
- A flawed system of incentives that does not always reward individuals and organizations for doing "the right thing" and has often rewarded contractors despite poor performance.

³Federal Research: Super Collider—National Security Benefits, Similar Projects, and Cost (GAO/RCED-93-158, May 14, 1993).

⁴Complete original cost estimates and current cost estimates were available for 22 of the 34 ongoing projects. Of the 22 projects, 17 were experiencing cost overruns, and 16 were experiencing schedule slippage.

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- The difficulty in hiring, training, and retaining enough people with the requisite skills to provide effective oversight and/or management of contractors' operations.

DOE's missions have continued to evolve to the point where today's DOE bears little resemblance to the Department created in 1977. DOE is no longer focused primarily on developing alternative sources of energy, producing nuclear weapons, or modernizing the nuclear weapons complex. Today, DOE's focus has turned to maintaining the nation's scientific and technological leadership, cleaning up the environmental contamination resulting from the past 50 years of operating the nuclear weapons complex, and providing stewardship for the nation's nuclear weapons stockpile. Such changing missions, coupled with the fact that these projects take years to complete and often cost billions of dollars, make it very difficult for DOE to maintain the congressional and stakeholder support needed to complete these projects.

To carry out its mission, DOE has historically received incremental funding for its projects. One problem with incremental funding is that the budget authority for the total cost of the project is not provided when the project is approved. Furthermore, for many projects, particularly in their first years of development and construction, the funding received is considerably below the amount requested. This causes project schedules to slip and costs to rise. For example, certain contractor expenses and administrative costs (e.g., costs for heat, lights, water, security, etc.) will accrue regardless of whether any progress is being made on the project. As a result, projects that received only partial funding usually end up costing more than originally estimated and years behind schedule.

Inappropriate incentives have also contributed to late and costly projects. Past Secretaries of Energy have commented on the need to change the incentives in DOE to focus less on production-oriented quotas and more on other important issues, such as environmental health and safety and efficient management. Some DOE managers view themselves as advocates for their projects, which provides an incentive for them not to surface potential problems that could cancel their projects. For example, participants in the Superconducting Super Collider were focused on continuing the project in order to maintain U.S. preeminence in high-energy physics despite repeated reports of chronic management problems and enormous cost overruns.

Most DOE contracts have incentives—such as bonuses or penalties—to prompt satisfactory contractor performance. However, we have found that in some instances, DOE contracting officers did not use the penalty clauses and gave contractors substantial bonuses despite subpar performance. For example, during fiscal years 1986 through 1988, many safety and health deficiencies at DOE’s Rocky Flats Plant in Colorado were repeatedly raised by DOE safety staff. These included problems in the plant’s radiological protection program and a lack of commitment by the plant’s management to improve overall safety and health conditions. Despite this poor performance, the contractor received over \$26 million in bonuses during this period. The plant was eventually shut down for safety problems, among other things.

The last factor is DOE’s lack of technical expertise to oversee the design, construction, and operation of its major system acquisitions. This problem has been chronicled since DOE’s early years. A 1981 DOE task force and a 1987 report by the National Research Council both noted DOE’s lack of technical capabilities and expertise. A March 1996 report by the Defense Nuclear Facilities Safety Board echoed those same concerns. Throughout a series of management reviews of DOE that we began in 1991, many DOE managers told us that the lack of skilled staff in program, project, and contracting oversight positions is one of the most fundamental problems in the Department.

Efforts to Resolve Acquisition Problems

There are no quick, easy solutions to DOE’s problems in keeping its major system acquisitions on schedule and within budget. However, several governmentwide initiatives could help. Recent changes to federal procurement laws, including the Federal Acquisition Streamlining Act of 1994 and the Clinger-Cohen Act of 1996 (formerly called the Federal Acquisition Reform Act of 1996) provide an impetus for agencies to, among other things, improve the technical capabilities and performance of their acquisition management staffs. This could help resolve a long-standing problem at DOE. In addition, as of July 1996, the Office of Management and Budget has required all federal agencies to request full funding for fixed assets (including major system acquisitions). If a project or separable segment⁵ of a project is approved, the agency will receive budget authority for the full amount of the project’s or segment’s estimated cost and will not have to return to the Congress for additional budget authority each year.

⁵The guidance from the Office of Management and Budget allows for the full funding of economically or programmatically separable segments of projects.

The full-funding provision could have a significant impact on DOE's management of its major system acquisitions. The Department and other stakeholders, such as the Congress, need to reach a consensus on which of DOE's major system acquisitions are most mission-critical. Then, by knowing that the funding will be available when needed, DOE and its contractors should be better able to stay within cost estimates and keep the projects on schedule. DOE has begun to implement the full-funding concept in its fiscal year 1998 budget.

Furthermore, in 1994, DOE began implementing management initiatives in the areas of contract reform, strategic systems and life-cycle asset management, strategic planning, information resources management planning, and financial planning. Some of these initiatives, such as contract reform, could improve many aspects of DOE's contracting by stimulating more competition and better control over the contractors. This could lead to cost savings and quality improvements.

Observations

We believe that these initiatives have the potential to help improve DOE's management of its major system acquisitions, but DOE may need help in addressing some of the key factors. For example, this is an ideal time to reevaluate DOE's missions; however, DOE cannot do this alone because the Congress plays a key role in setting the Department's priorities. Nevertheless, we believe that DOE's management initiatives offer an opportunity for DOE to begin addressing some of the factors affecting the management of its major system acquisitions.

Thank you, Mr. Chairman and Members of the Subcommittee. That concludes our testimony. We would be happy to respond to any questions you may have.

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