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NUCLEAR WASTE

Department of Energy's Pit 9 Cleanup Project Is Experiencing Problems

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Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss a major Department of Energy (DOE) cleanup project—remediation of wastes buried in Pit 9 at the Idaho National Engineering and Environmental Laboratory. As you know, this project is very important to DOE because it is one of several projects where, through fixed-price contracting and private sector financing, DOE is trying to reduce the cost of cleaning up waste sites while shifting the consequences of poor performance to the contractors. While we have been supportive of DOE's efforts to reform its contracting practices, we have also been concerned that the Department effectively manage this transition. Because DOE has several billion dollars targeted for similar types of projects, it is important that DOE be able to effectively structure and oversee this type of contracting arrangement.

On the basis of our work for the Committee and the report we are issuing today,[1] our testimony will address (1) DOE's basis for selecting a fixed-price contracting approach and a subcontract for the project, (2) the basis for awarding the subcontract to Lockheed Martin Advanced Environmental Systems, and (3) the current status of the project.

In summary, we found the following:

•DOE chose a fixed-price approach for the project because Department officials believed a fixed price would help limit the project's total costs and provide an incentive for contractors to use efficient practices in carrying out the cleanup by shifting the risk of nonperformance to the contractor. DOE officials believed they had a better chance of achieving these goals with a fixed-price approach than with a cost-reimbursement approach, even though uncertainties existed about the actual wastes in the pit. DOE also directed its M&O contractor at the Idaho Falls site to conduct the procurement process for the selection of a subcontractor and to oversee the project.

•The M&O contractor awarded the subcontract to Lockheed Martin Advanced Environmental Systems on the basis of several key factors, including the adequacy of its technical proposal, its apparent technical and managerial expertise, its successful completion of the test phase, the price—about $200 million, and a guarantee of performance—under which the company would return all payments received if its treatment system failed to work properly. Because of reservations about the maturity of the technologies, the M&O contractor expanded the test phase of the

[1]Nuclear Waste: Department of Energy's Project to Clean Up Pit 9 at Idaho Falls Is Experiencing Problems (GAO/RCED-97-180, Jul. 28, 1997).

procurement from a review of references and results of prior work to include pilot scale testing of key aspects of the proposed systems.

•Estimated completion of the project is at least 26 months behind the original subcontract schedule. Furthermore, the waste retrieval and processing facilities are not ready, and no retrieval or treatment of wastes has begun. Instead, DOE has been assessed $940,000 in fines by its regulators—the state of Idaho and the Environmental Protection Agency—for failure to meet deadlines for submitting acceptable design documents. Lockheed Martin Advanced Environmental Systems estimates that its costs have already exceeded the subcontract price and has requested $257 million for its work through June 30, 1997, as well as a new cost-based subcontract to reimburse the company for all future costs. These changes, if implemented, would bring the total subcontract price for the Pit 9 cleanup to well over twice its original $200 million value. The company's basis for requesting more money is its view that problems with the project are largely attributable to DOE and its M&O contractor for improper administration of the subcontract, excessive interference, and substantially changing the estimate of types and amounts of materials contained in Pit 9. DOE officials said that it may be several months before they have an official position on the company's claims, but DOE and the M&O contractor disagree with the assessment of what caused the problems and instead point mainly to the subcontractor's insufficient application of technical and management skills on the project.

Discussions are continuing, and the outcome of the disagreement is uncertain. Meanwhile, because of these contract difficulties and the related legal implications, the M&O contractor has hired outside legal counsel for the Pit 9 project and, under the terms of the M&O contract, DOE is responsible for paying those legal fees. Whatever the outcome, the Pit 9 project, as originally conceived, is clearly a failure. It simply cannot be completed in the time frame or within the price agreed to by the subcontractor. This has important future implications because DOE's planned investment in privatization cleanup projects is growing—DOE included over $1 billion in its fiscal year 1998 budget request for 11 such projects.

Before we provide you with more specifics on these issues, we would like to briefly describe Pit 9 and the cleanup strategy.

Mr. Chairman and Members of the Subcommittee:

Background

Pit 9 is an inactive waste disposal pit, slightly larger than 1 acre in surface area. From November 1967 through June 1969, various wastes ranging from contaminated rags to storage drums with hazardous chemicals and plutonium-contaminated sludge were dumped into the pit and covered with a layer of soil. DOE estimated that the pit contains about 250,000 cubic feet of transuranic and hazardous wastes[2] and contaminated soil needing treatment. Because the wastes and soil are radioactive, retrieving and treating them involves special handling so that workers are not exposed to contamination and radioactive materials are not released to the environment.

Starting in 1991, DOE and its regulators began exploring ways to remediate Pit 9. They hoped that in doing so, they would also obtain information that would help in cleaning up other locations at the Idaho Falls site. DOE and its regulators agreed to clean up Pit 9 by retrieving soil and waste from the pit, separating those materials that could be returned to the pit without treatment, treating the remaining soil and waste to achieve at least a 90-percent reduction in volume, and packaging the remaining concentrated material for on-site storage until final disposal. The project was to proceed in three phases—proof-of-process by testing key components on simulated wastes, limited production tests on actual pit wastes, and then full-scale remediation of pit wastes.

Pit 9 is one of the first of several privatization projects at DOE sites. DOE's Office of Environmental Management, which is responsible for cleanup efforts, intends privatization projects to involve fixed-price, competitively awarded contracts. A private contractor would finance, design, build, own, and operate any required waste cleanup facilities, and DOE would pay the contractor only for a successful cleanup. This fixed-price approach is in contrast to the Department's past practices, where DOE used a cost-reimbursement contract, told the M&O contractor how to perform waste-related cleanup activities, and paid the M&O contractor regardless of what was accomplished.

Now we will discuss our findings in greater detail.

[2]Transuranic wastes are man-made radioactive elements produced from uranium during a nuclear reactor's operations and emit alpha particles. Alpha-emitters are dangerous because of inhalation concerns. Hazardous wastes are wastes regulated by EPA and authorized states under the Resource Conservation and Recovery Act of 1976. Hazardous wastes at Pit 9 include carbon tetrachloride and mercury.

DOE Preferred a Fixed-Price Subcontract

DOE selected a fixed-price approach for the project despite some indications that this approach was not well suited for an application such as Pit 9. Limited guidance exists on selecting a contract type, but the Federal Acquisition Regulation (FAR) suggests that a firm fixed-price contract, which best utilizes the basic profit motive of the private sector, should be used when the risk involved is minimal or can be predicted with an acceptable degree of certainty. Given that there was little certainty about the contents of the pit, this guidance seems to suggest that a fixed-price contract may not have been the best approach.

Questions about whether a fixed-price approach was appropriate for the Pit 9 cleanup surfaced during the early stages of the procurement process. Responses to the draft request for proposal (RFP) included concerns from interested firms that a fixed-price approach would have to reflect large contingencies and could therefore result in higher bids from the competitors. In addition, these responses stated that a fixed-price subcontract could generate claims for additional reimbursement if work outside the scope of the contract occurred.

Even with these concerns, DOE decided to use a fixed-price approach. According to DOE officials at the Idaho Falls site, they realized that a fixed-price approach to this cleanup entailed some risks due to the uncertainties of the pit's contents. However, DOE also believed there was much to be gained, including information on how to effectively clean up other DOE disposal sites, if this new approach were successful. In addition, DOE had come under criticism from private industry for continuing to fund what was perceived as research and development efforts of its M&O contractors without any actual cleanup. According to senior DOE officials, private industry was confident that it had the technology to clean up the wastes and preferred a fixed-price arrangement. Therefore, senior DOE officials at Idaho Falls and headquarters decided that the potential benefits associated with fixed-price contracting outweighed the possible risks.

In conjunction with its decision to use a fixed-price approach to the Pit 9 cleanup, DOE also decided to have its M&O contractor—EG&G Idaho, Inc.(EG&G)—conduct the procurement process, select the subcontractor, and oversee the subcontractor's efforts at Pit 9. According to DOE officials, there were several reasons for choosing a subcontract for this effort: (1) DOE believed that EG&G already had the necessary expertise to evaluate the technical proposals submitted by interested firms and to oversee the cleanup; (2) DOE considered the Pit 9 project to be within EG&G's area of responsibility; and (3) DOE believed the project could be

executed more efficiently as a subcontract through EG&G because using the M&O's procurement and contracting standards would simplify and streamline the procurement process.

Subcontractor Selected Based on Proposal, Experience, Price, and Performance Guarantee

After several steps to provide information to interested firms, EG&G received proposals from three competitors—a team led by Lockheed and two other teams, one led by Rust Federal Services (formerly Waste Management Environmental Services), and the other by Nuclear Radiation Technologies Corporation. EG&G used a Source Evaluation Board (Board) to review and evaluate the three proposals. The Board determined that the Lockheed and Rust proposals were essentially equivalent, but the Board had significant reservations about whether the proposed technologies were sufficiently developed. According to DOE officials, the private sector—including representatives from the two competing teams—had been telling DOE and EG&G that proven, "off-the-shelf" technology was capable of remediating the wastes in the pit. However, the Board believed that while the components of the proposed systems may have been tested individually, they had never been combined into a total system to treat radiologically contaminated materials.

Although the Board had reservations, it also believed that these two technical proposals reflected the best available processes at the time. To mitigate concerns about the proposed technologies, the Board recommended that, in going forward with the procurement, the proof-of-process phase be expanded from a review of references and results of prior work to include pilot scale testing of critical aspects of both treatment systems.

Prior to the conclusion of the proof-of-process phase, EG&G sent a request for pricing proposal to both teams. Although DOE's original intent had been to make no payments until actual remediation began, the request for pricing proposal provided for some design milestone and construction progress payments to keep the overall subcontract price lower by offsetting the subcontractor's cost of financing. Because of this change in payment strategy, the request for pricing proposal also required a corporate guarantee of performance to protect the government's interests. Under this corporate guarantee, if the subcontractor's proposed system did not pass the limited production test at completion of construction and installation, the subcontractor would be required to return all payments made to date. When the Rust team declined to provide the corporate

guarantee, EG&G deemed Rust to be nonresponsive to the request for pricing proposal and disqualified them from further consideration.

The subcontract for the Pit 9 cleanup was signed in October 1994 and included both design milestone and construction progress payments, unit price payments for remediation of the contents of the pit, and lump sum payments for decontamination and decommissioning and profits. Since Lockheed replaced EG&G as the M&O contractor in 1994, to address the potential conflict of interest associated with one Lockheed company overseeing a subcontract with another Lockheed company, the Lockheed M&O contractor prepared an organizational conflict-of-interest mitigation plan that was reviewed and approved by DOE. This resulted in the M&O contractor's Pit 9 contract administration and oversight group being sequestered from the rest of the organization, and the establishment of a program oversight board to monitor the dealings between the M&O contractor and the subcontractor.

Subcontractor Wants to Renegotiate Contract Because of Schedule and Cost Difficulties

Currently, the project is stalled. LMAES estimates it is at least 26 months behind the original subcontract completion schedule and that its costs have already exceeded the $200 million subcontract price. LMAES has asked for $257.4 million in total reimbursable costs through June 30, 1997.[3] For any work conducted after April 1, 1997, LMAES asked to convert the existing subcontract to a cost-reimbursement basis. These changes, if implemented, would bring the total subcontract price to well over twice its original $200 million value. Furthermore, LMAES has substantially slowed its work on the project to limit its costs and says it will not resume normal construction activities unless the subcontract is satisfactorily renegotiated.

In addition to possible increases in subcontract price, DOE has incurred or will incur other costs related to Pit 9. For example, DOE has paid $23.1 million for testing and preliminary design activities and $12.9 million for project oversight by the M&O contractor, in addition to about $3 million for DOE oversight costs. DOE was also assessed $940,000 in fines by its regulators for failure to meet enforceable deadlines for submitting acceptable design documents for the project, as specified in the Federal Facility Agreement and Consent Order for the Idaho Falls site. DOE will pay the fines and is studying its options for recovering the cost from either the M&O contractor or LMAES. In addition, because of the contract difficulties

[3]LMAES asked for $158.1 million in payments in addition to the $52.9 million already received through March 1997. LMAES expected an additional $46.4 million to be recovered through future milestone payments or some other method.

with LMAES, the M&O contractor has hired outside legal counsel for the Pit 9 project and, under the terms of the M&O contract, DOE is responsible for paying those legal fees.[4]

Subcontractor Faults DOE for Schedule and Cost Problems

LMAES blames DOE and its M&O contractor for a large portion of the schedule and cost problems. The company stated its case in its Request for Equitable Adjustment to the M&O contractor and DOE. In summary, this document focuses on three main factors that LMAES says were under DOE's control and led to the schedule and cost problems: (1) improper administration of the fixed-price subcontract, (2) too much interference with a fast-track approach that was necessary to meet contract deadlines, and (3) changing estimates of Pit 9's contents. LMAES argues that these factors, particularly DOE's involvement in design activities and changing pit inventories, have materially changed the Pit 9 project from what the subcontract originally required. Therefore, LMAES believes that its corporate guarantee of performance is no longer applicable to the project.

Subcontract Administration

LMAES says that it undertook the project with the expectation that it would have comparatively more freedom on the privatized, fixed-price Pit 9 project than on a project procured under a cost-reimbursement approach, while accepting more risk if it failed. The company assumed there would be minimal government oversight and administration of the subcontractor's effort, because of DOE's representation in subcontract specifications that the Pit 9 project was an "integrated 'turnkey' pilot" effort, with the "subcontractor assuming maximum responsibility, authority, and liability." In contrast to what it expected, LMAES says that DOE and its M&O contractor actually administered the subcontract using substantial and intrusive oversight that was inconsistent with DOE's privatization concept. According to LMAES, the amount of oversight was a problem because the number of review comments slowed its efforts and left the company unable to exercise the degree of flexibility it expected when it negotiated the subcontract. In having to respond to this degree of oversight, LMAES said that it was performing unanticipated work, well beyond the subcontract's scope, in order to keep the project moving forward.

[4]We have previously reported on DOE efforts to control the legal expenses its M&O contractors incur in defending themselves against class action lawsuits. See Managing DOE: The Department's Efforts to Control Litigation Costs (GAO/T-RCED-96-170, May 14, 1996); Managing DOE: The Department of Energy Is Making Efforts to Control Litigation Costs (GAO/RCED-95-36, Nov. 22, 1994); and Managing DOE: Tighter Controls Needed Over the Department of Energy's Outside Litigation Costs (GAO/T-RCED-94-264, July 13, 1994).

Fast-Track Schedule

A fast-track, phased construction project is one where design and construction work are performed simultaneously. Design and construction stages are completed in phases so that when the design is completed for part of the project, construction work on that portion of the project begins. LMAES, DOE, and the regulators agreed to a fast-track approach for the project in order to comply with the construction schedule specified in the request for price proposal. LMAES said, however, that a fast-track approach required that the subcontractor be allowed a great deal of discretion in determining the manner, means, and methods of meeting the project requirements within the agreed-upon price and schedule. The company believes that DOE's oversight and involvement was so excessive as to remove all discretion for reducing the time required for project completion. In addition, LMAES said that DOE did not provide all necessary information in a timely manner, taking an average of 53 days to provide review comments instead of the 30 days to which DOE agreed.

Contents of the Pit

DOE has limited information as to the actual contents of the pit because, at the time the wastes were placed in the pit, DOE did not intend to later retrieve them. Few records were kept, and DOE has no precise knowledge of what quantities and types of materials are in the pit. However, in 1991, the M&O contractor initially estimated the types and quantities of radioactive and other materials in the pit, based on available shipping records, process knowledge, written correspondence, and other DOE information. Those estimates were included in the subcontract. Then, beginning in 1993, the M&O contractor initiated an effort to develop additional information on all of the disposal pits and trenches at the Idaho Falls site's subsurface disposal area, including Pit 9. As a result, the estimates for the Pit 9 contents were refined several times, and LMAES cites multiple instances in which those revisions created the potential for substantial changes in the proposed approach to remediating the waste. In particular, LMAES is concerned about possible increases in salts, organics, and radioactive products. These materials could affect both (1) the extent of protection workers need to safely work in the treatment building and (2) the speed at which material could be processed through the melter.

DOE Attributes Most Problems to Subcontractor Performance

DOE and its M&O contractor are studying LMAES' claims and are involved in discussions on how to move the project forward. However, the M&O contractor has notified LMAES that both the M&O and DOE see no justification for converting the subcontract to a cost-reimbursement basis; instead, they expect LMAES to continue performing the subcontract as awarded. DOE officials said that it may be several months before they have

an official position on LMAES' other financial claims. However, DOE and the M&O contractor have a substantially different view of why the cleanup is behind schedule and its costs are above the subcontract price. They attribute the schedule delays and cost overruns primarily to the insufficient technical and managerial skills LMAES initially placed on the project.

Subcontract Administration and Fast-Track Schedule

DOE and its M&O contractor contend that their oversight of the project has been related to their responsibilities for ensuring adequate consideration of environmental safety and health. DOE, its M&O contractor, and its regulators noted that initially LMAES personnel seemed particularly limited in their knowledge about necessary regulatory requirements, including those related to air emissions and dealing with nuclear materials, and, as a result, submitted inadequate designs. Therefore, DOE and the M&O contractor said that they had to provide much more oversight, including more design review comments, than they expected for a fixed-price subcontract situation. However, DOE officials do not agree that they were slow in providing these review comments, as LMAES contends.

Contents of the Pit

DOE and its M&O contractor also disagree with LMAES' contentions regarding the significance of the updated information about the contents of the pit that they shared with LMAES. They noted that the updated information was not a formal revision to the contractual estimate of the pit's contents, and, therefore, the subcontractor had the discretion whether to use it. DOE and its M&O contractor further noted that LMAES' subcontract proposal stated that all technologies used in its proposed approach were proven in current industrial-scale applications, and the treatment scheme was "very robust, in that any chemical, radiological, or physical characteristic of waste in Pit 9 can successfully be processed." LMAES also claimed that its treatment scheme ensured that the Pit 9 process could successfully handle other buried or stored transuranic and transuranic mixed wastes as well as low-level mixed wastes and hazardous wastes in the DOE complex. Finally, DOE and M&O contractor officials noted that the subcontract included a clause allowing for future adjustments if differing site conditions were encountered—for example, if the actual pit contents differ from the estimates when excavation occurs.

Insufficient Technical and Managerial Skills

DOE and M&O contractor officials said that they believed LMAES' parent corporation would use its vast worldwide resources to provide the necessary expertise to accomplish the work. However, the officials contend that this did not happen, at least in the early phases of the work. For example, the officials point out that Lockheed reported in a 1995 peer

review of LMAES' Pit 9 activities that there was a lack of adequate nuclear-experienced personnel to successfully execute the design review function, provide environmental safety and health oversight during construction, and administer the environmental safety and health functions during operations.

Another problem contributing to lack of progress on the subcontract, according to DOE and M&O contractor officials, was the high number of times the LMAES project staff has changed—as of May 1997, there have been four project managers. LMAES acknowledges the turnover but maintains that the administrative approach used by DOE and the M&O contractor materially increased the complexity of the requirements associated with the project, necessitating the assignment of managers with more experience to get the job done. DOE officials said that with these frequent changes in leadership, some important actions were left unaddressed for a considerable length of time. For example, it was not until February 1997, after the current manager was appointed, that LMAES developed a complete system requirements document, which compiles the system performance and design requirements of the subcontract into one place so that managers can more clearly identify what the processes should be designed to do.

DOE has also faulted the M&O contractor for its performance in overseeing the Pit 9 project. DOE attributed the M&O's declining performance on Pit 9 to a continued lack of management control systems, an apparent lack of accountability in ensuring the timely submittal of two key documents to regulators, and weak project management planning and prioritization of issues. However, DOE also gave the M&O contractor credit for aggressively trying to keep activities on schedule and resolve design-related issues at the earliest opportunity. We could not determine the impact of the M&O contractor's performance at Pit 9 on the amount of its overall award fee. However, since 1994, DOE has considered the M&O's overall performance under the contract to be "good," with performance evaluation scores in the 86 to 90 percent range and performance award fees totaling $33.3 million for the 2-year period.

Conclusions

It remains to be seen whether DOE and its M&O contractor will be able to hold Lockheed Martin Advanced Environmental Systems accountable for the extra project costs, negotiate changes and pay substantially more to complete the project, or attempt to recover the government's investments to date. Whatever the outcome, the Pit 9 project, as originally conceived, is

Mr. Chairman and Members of the Subcommittee:

clearly a failure. It simply cannot be completed in the time frame or within the price the subcontractor agreed to. This has important future implications because DOE's planned investment in privatization cleanup projects is growing—DOE included over $1 billion in its fiscal year 1998 budget request for 11 such projects. In light of this growing DOE emphasis on privatization, the outcome of the Pit 9 subcontract negotiations may provide some insight into DOE's overall ability to achieve privatization goals, including lower project costs and the risk of nonperformance shifted from DOE to the contractors.

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

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