



U.S. Department of Energy
Office of Inspector General
Office of Audit Services

Audit Report

Gas Centrifuge Enrichment Plant Cleanup Project at Portsmouth

DOE/IG-0678

March 2005



Department of Energy

Washington, DC 20585

March 10, 2005

MEMORANDUM FOR THE SECRETARY

FROM:

Greg Friedman
Gregory H. Friedman
Inspector General

SUBJECT:

INFORMATION: Audit Report on "Gas Centrifuge
Enrichment Plant Cleanup Project at Portsmouth"

BACKGROUND

In 1985, the Department of Energy (Department) ceased its efforts to develop gas centrifuge technology to enrich uranium. Prior to cancellation, more than \$2.5 billion had been spent on the program, including the construction of facilities to support a Gas Centrifuge Enrichment Plant (GCEP) at the Portsmouth Gaseous Diffusion Plant located in south central Ohio. When the project was cancelled, the gas centrifuge equipment was abandoned in place and the remainder of the facility was used for activities related to the Department's mission.

In June 2002, the Department and the United States Enrichment Corporation, Inc., (USEC) a private sector corporation, signed an agreement which, in part, pledged both parties to long-term commitments in the further development of gas centrifuge technology. USEC subsequently agreed to build and operate, at its own expense, an advanced uranium enrichment plant at the Portsmouth site, and the Department agreed to support USEC's program by accelerating the cleanup of the GCEP facilities. The Department estimated that the accelerated GCEP cleanup activities would have a total life-cycle cost of \$80 million. Because USEC and the Department have shared responsibilities for centrifuge program-related tasks, we initiated this audit to determine whether actions taken and costs incurred by the Department were in accordance with the agreement.

RESULTS OF AUDIT

The Department will spend at least \$17 million for activities that are not specifically related to accelerating cleanup at Portsmouth and may not be required by the Department/USEC agreement. This includes \$14 million to relocate certain necessary Department missions to other facilities simply to accommodate USEC's schedule for its advanced uranium enrichment plant. Similarly, although initial cleanup plans were to leave the Portsmouth centrifuge equipment in place until dismantlement, the Department has agreed to transfer the equipment to a temporary storage location at an additional cost of \$3 million, prior to dismantlement, again, in order to meet USEC's schedule. We



found that the June 2002 agreement did not outline the specific costs to be borne by each party. As a result, we encountered a good deal of confusion as to the Department's responsibility for absorbing costs not directly related to accelerating cleanup at Portsmouth. In addition, we noted that a comprehensive baseline for the GCEP Cleanup Project had not been developed. We believe that without such a baseline, the Department risks making questionable expenditures in the future to support USEC's private sector, for-profit activities. For example, Department officials at the site anticipated further requests from USEC for additional commercial facilities that would cost the Department about \$16 million.

Funding GCEP activities that are not specifically necessary for cleanup, but which primarily benefit USEC's for-profit activities, diverts taxpayer provided resources that could be devoted to other pressing Department of Energy cleanup needs. Furthermore, such action appears to be inconsistent with Congressional guidance regarding development of advanced uranium enrichment technologies. Specifically, in February 2003, the House of Representatives conferees noted that USEC was moving forward with the development of such technology and encouraged the Department to offer its expertise, on a reimbursable basis, to support such private sector activities. The conference report went on to indicate, however, that this effort was best handled by the private sector and that the Department should focus its limited research resources on areas not adequately addressed by the private sector.

As previously identified in our audit on the *Cold Standby Program at the Portsmouth Gaseous Diffusion Plant* (DOE/IG-0634, December 2003), an absence of a clearly defined project scope is not unique to the GCEP Cleanup Project. However, we noted that, in the case of GCEP cleanup, the Office of Environmental Management (EM) had taken measures to better control project costs. These efforts included developing an integrated cost estimate, refining project technical requirements, negotiating costs with USEC, and increasing management oversight over initial work activities. In addition, EM stated that a baseline, which addresses many of the concerns raised in this report, had been prepared and is awaiting final approval. However, additional actions are necessary to ensure that costs incurred for cleanup efforts at Portsmouth are the Department's responsibility. In that connection, we recommended actions that, when completed, should help improve the Department's control of these costs.

MANAGEMENT REACTION

The Assistant Secretary for Environmental Management concurred with our recommendations and initiated corrective actions. Management's written comments also expressed concerns that the report did not recognize other Department initiatives, independent of the USEC agreement, which may have accelerated cleanup of the GCEP facilities. To account for these additional corporate objectives, EM suggested that we increase the scope of the first recommendation by proposing that the Department determine all of the activities necessary to meet the overall objective of preparing the GCEP facilities for future privately-funded reuse. In response, we broadened our audit recommendation to account for the Department's reuse policies, while ensuring only

necessary costs are incurred by the Department. Where appropriate, we modified our report in response to management's comments. Management's comments and our response are summarized beginning on page 4 of the report and are included in Appendix 3.

Attachment

cc: Under Secretary for Energy, Science and Environment
Assistant Secretary for Environmental Management
Manager, Portsmouth/Paducah Project Office

REPORT ON THE GAS CENTRIFUGE ENRICHMENT PLANT CLEANUP PROJECT AT PORTSMOUTH

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GAS CENTRIFUGE ENRICHMENT PLANT CLEANUP PROJECT

GCEP Cleanup Project Plans

The Department's accelerated GCEP cleanup activities (GCEP Cleanup Project) included an estimated \$17 million for non-cleanup related activities that appear to be outside the scope of the agreement with USEC. Specifically, the Department plans to incur costs for actions taken to vacate GCEP facilities currently used for ongoing Departmental missions and for a change in the centrifuge machine dismantlement strategy to accommodate USEC's schedule.

Vacating Facilities

To comply with USEC's American Centrifuge Program plans, the transfer of certain GCEP facilities to USEC will require the Department to relocate missions and personnel housed in the facilities to other on-site locations. The Department originally intended to retain these facilities in support of on-site operations or until the cleanup mission at the Portsmouth Gaseous Diffusion Plant (Portsmouth) was completed. To accommodate USEC, however, the Department now plans to spend \$14 million on this effort. In particular:

- The Department plans to spend \$5 million to relocate office space and maintenance shop missions. Relocation activities include moving personnel, office furniture, shop equipment, computers, and telephones. Before the relocations occur, the replacement office space, rest rooms, locker rooms, document storage areas, maintenance shops, training facilities, and laboratories will be repaired or renovated. Carpet, ceiling tiles, and lights will be replaced, interior surfaces painted, and fire alarm, sprinkler, and computer network systems will be inspected and modified, as needed.
- The Department also plans to spend almost \$9 million to vacate areas currently used for waste management and storage. These vacating activities include moving waste not yet ready for disposition to other locations, performing surface decontamination of the storage area, and negotiating Resource Conservation and Recovery Act (RCRA) closure certification. Program officials must then establish a replacement RCRA storage area and acquire office space for waste management operations elsewhere at

the site. Planned building repairs and modifications to the replacement storage area will include inspection and corrective maintenance on the electrical, plumbing, and communication systems, installation of a 10,000 square foot storage pad, as well as the negotiation of a new RCRA permit.

Dismantlement Strategy

The Department will also pay an estimated \$3 million to move centrifuge machines prior to their dismantlement in support of the American Centrifuge Program schedule. According to a USEC proposal, over 1,300 centrifuge machines and associated process piping, support equipment, and structures must be disassembled and removed to allow for construction and operation of its pilot plant, the Lead Cascade demonstration facility. Initial cleanup plans called for the machines to be stored in their current locations until they were ready for disassembly. However, after determining that the machines needed to be moved earlier to meet USEC's Lead Cascade construction milestone, the Department agreed to transfer the machines to a temporary storage location at a cost of \$3 million, pending dismantlement.

In commenting on our draft report, management stated that the Department had made an earlier decision to aggressively explore how the workforce and facilities at the Portsmouth site could continue to serve the national interest, including making the GCEP facilities available for commercial reuse. As a result, the Department believes that, absent the agreement with USEC, making the facilities available for reuse would still mean completing most of the activities we characterized as avoidable. However, in our judgment, it is unlikely that the Department would have spent the \$5 million to relocate personnel and renovate additional facilities while they were still in use for mission-related activities. In addition, since the waste stored in the GCEP facility was scheduled to be removed by 2007, the \$9 million in additional waste management costs would have been largely unnecessary.

Agreement Execution

Expenses beyond normal decontamination and decommissioning costs will be incurred because the June 2002 agreement between USEC and the Department did not provide detailed analyses clearly outlining the division of costs. In addition, the Department had not developed a comprehensive baseline for accelerated GCEP cleanup.

June 2002 Agreement

Although the June 2002 agreement with USEC indicated that the Department was to pay for normal decontamination and decommissioning costs, the agreement was not clear on the cost division for non-cleanup activities. Management stated that the Department developed a plan to clean up the GCEP facilities in 2000 when a Department-funded gas centrifuge plant was being considered. However, once the June 2002 agreement was made for USEC to deploy the centrifuge plant, the cleanup plans were not updated to identify which activities were considered normal decontamination and decommissioning and which were USEC's responsibility. As a result, the Department's project plans did not require USEC to pay for non-cleanup costs incurred during accelerated cleanup and facility transfer. Had specific cost responsibility for all activities been identified and appropriately assigned, non-cleanup costs incurred by the Department could have been avoided.

During our review, we held several discussions with site-level managers regarding the Department's obligations, as stated in the June 2002 agreement with USEC. These officials acknowledged that the costs we identified are inconsistent with the agreement but that the Department's unwritten policy had been to pay these costs. In support of their position, these program managers cited a press release and a budget submittal to illustrate their viewpoint. The budget document detailed the Department's intention to assume responsibility for the out-of-scope activities we identified, and these activities were subsequently funded through the Fiscal Year 2004 congressional appropriation. Program managers, however, agreed that a formal determination of the Department's cost responsibilities, under the June 2002 agreement, would be beneficial.

Project Baseline

The Department also had not implemented a project baseline to ensure that costs incurred were appropriate and in accordance with the agreement. A project baseline, against which project performance would be measured, is the primary instrument for controlling changes to the technical scope, cost, and schedule. While project cost estimates and schedules were prepared, a comprehensive programmatic baseline had not been developed more than two years after signing the agreement to accelerate cleanup at Portsmouth. According to the Office of Environmental

Management, (EM) delays in formal baseline development were due in part, to management transitions from the Oak Ridge Operations Office to a new office in Lexington, Kentucky. EM stated that a comprehensive baseline had been prepared subsequent to the issuance of a draft of our report, and was awaiting final approval. In EM's view, this baseline, developed in response to our suggestions and as a result of the stabilization of GCEP facilities for reuse, should address many of the concerns voiced in this report.

Cost and Performance Impacts

As discussed previously, the Department will incur up to \$17 million in non-cleanup costs during the early stages of the GCEP Cleanup Project. These costs include the \$14 million to relocate Department missions and the \$3 million attributable to changes in centrifuge machine dismantlement strategy. The Department is also at risk of increasing the project's life-cycle costs by incurring an additional \$16 million in non-cleanup costs for activities conducted in support of USEC's American Centrifuge Program. Specifically, the Department estimates that it may cost almost \$11 million for construction and relocation activities if USEC requests additional office space for its commercial operations. Similarly, the Department will likely pay about \$5 million to move the GCEP facilities' central heating system since the main component of this system is located in space requested for USEC's full-scale American Centrifuge Plant.

RECOMMENDATIONS

To ensure that expenditures are limited to those cleanup costs for which the Department is specifically responsible, we recommend that the Assistant Secretary for EM require the Manager, Portsmouth/Paducah Project Office to:

1. Identify the activities necessary, based on Department policy and project requirements, to complete the GCEP Cleanup Project and formally assign responsibilities for costs to the appropriate party; and,
2. Develop a comprehensive baseline to carry out the Department's responsibilities for the GCEP Cleanup Project.

MANAGEMENT REACTION

The Assistant Secretary for Environmental Management concurred with the recommendations, but suggested that they be modified to encompass the Department's corporate objective to explore how the workforce and facilities at the Portsmouth site could continue to serve the national interest. Specifically, the

report did not recognize that the June 2002 agreement was part of an objective to prepare the GCEP facilities for future privately-funded use and an element of an overall approach aimed at addressing the national challenge of stabilizing the domestic nuclear fuel industry. The agreement set broad guidelines and did not commit or specify activities necessary for GCEP cleanup. Finally, management indicated that a comprehensive baseline, which takes into account many of the concerns voiced in our report, had been prepared.

**AUDITOR
COMMENTS**

Management's comments are responsive to our recommendations and the proposed corrective actions, when fully implemented, should improve management of the GCEP Cleanup Project and help improve the Department's control of costs. We acknowledged the Department's efforts in reusing the GCEP facilities and supporting the deployment of advanced enrichment capability. Therefore, we broadened our audit recommendation as suggested to account for the Department's reuse policies and added management's views to the body of the report where appropriate.

Appendix 1

OBJECTIVE

The objective of this audit was to determine whether actions taken and costs incurred by the Department were in accordance with the June 2002 agreement with the United States Enrichment Corporation, Inc.

SCOPE

We performed the audit from February 2 through September 30, 2004, at the Oak Ridge Operations Office in Oak Ridge, Tennessee; the Portsmouth/Paducah Project Office in Lexington, Kentucky; and, the Portsmouth Gaseous Diffusion Plant in south central Ohio. The scope of the audit included the Department's actual and planned GCEP Cleanup Project activities from 2002 through 2007.

METHODOLOGY

To accomplish the audit objective, we:

- Analyzed the June 17, 2002 agreement between the Department and USEC;
- Discussed GCEP Cleanup Project activities with Department and contractor personnel;
- Observed GCEP Cleanup Project activities being conducted at the Portsmouth Gaseous Diffusion Plant in Ohio;
- Analyzed contractor proposals, work authorizations, and proposed baselines to determine the planned work and estimated costs;
- Evaluated the Department's project management practices; and,
- Reviewed applicable Federal regulations, Departmental orders, and implementing procedures and practices.

We conducted the audit according to generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not rely on computer processed data to accomplish our audit objective.

Finally, we assessed the Department's compliance with the Government Performance and Results Act of 1993. The Department did not establish specific performance measures related to the GCEP Cleanup Project.

We held an exit conference with Environmental Management on March 2, 2005.

PRIOR AUDIT REPORTS

- *Cold Standby Program at the Portsmouth Gaseous Diffusion Plant* (DOE/IG-0634, December 2003). The audit disclosed that the Department had not clearly defined the termination point of the Cold Standby Program, and total program costs had almost doubled from initial project estimates, increasing by about \$189 million. Similarly, the Department had not: formally updated program mission requirements; assigned responsibility of the program to a single organization; executed the most cost effective procurement strategy; nor, developed a programmatic baseline. Without a well-defined endpoint and a formalized process for assessing the continuing need of the Cold Standby Program, the Department risks possible unnecessary extensions of the program or potential disruptions in the supply of enriched uranium. In fact, if the Department decides to extend the Cold Standby Program until USEC deploys a full scale gas centrifuge plant, costs could increase from the initial \$210 million estimate to over \$600 million.



Department of Energy

Washington, DC 20585

February 9, 2005

MEMORANDUM FOR GREGORY H. FRIEDMAN
INSPECTOR GENERAL

FROM: PAUL M. GOLAN
ACTING ASSISTANT SECRETARY FOR
ENVIRONMENTAL MANAGEMENT

SUBJECT: MANAGEMENT REACTION ON DRAFT REPORT
"GAS CENTRIFUGE ENRICHMENT PLANT
CLEANUP PROJECT AT PORTSMOUTH"

Handwritten notes: "Audit of his" with a green highlight and an arrow pointing to the recipient name. A signature "mm" is written below the FROM field.

Attached are the Office of Environmental Management's comments as requested in Mr. Rickey R. Hass' December 21, 2004, memorandum.

Management concurs with both the Inspector General's recommendations contained in the draft report, subject above. However, we suggest that the first recommendation encompass the Department of Energy's (DOE) corporate objective to explore how the workforce and facilities at the Portsmouth site could continue to serve the national interest, and not be limited by what was the narrower companion initiative that resulted in the June 17, 2002, DOE-United States Enrichment Corporation Memorandum of Agreement.

I appreciate the opportunity to review the draft report and to provide comments. If you have any questions, please contact me at (202) 586-7709 or Mr. William Murphie, Portsmouth/Paducah Project Office Manager, at (859) 219-4000.

Attachment

cc: Susan Grant, ME-1
Merley Lewis, ME-1.1
William Murphie, PPPO



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