DOE/IG-0481

AUDIT REPORT

THE DECONTAMINATION AND DECOMMISSIONING CONTRACT AT THE EAST TENNESSEE TECHNOLOGY PARK

SEPTEMBER 2000

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

September 12, 1000

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Audit Report on "The Decontamination and Decommissioning Contract at the East Tennessee Technology Park"

BACKGROUND

The East Tennessee Technology Park (ETTP), formerly known as the K-25 Site, was established in 1942 to produce enriched uranium. Since the production mission ended in 1987, the Oak Ridge Operations Office (Operations Office), which is responsible for the ETTP, has focused on environmental management of the site. In August 1997, the Operations Office awarded a $238 million fixed-price contract to BNFL, Inc. (BNFL) to decontaminate and decommission (D&D) three large uranium enrichment buildings in the ETTP. BNFL was also to recycle or dispose of the materials in the buildings and make the buildings available for commercial use by September 2003. Through June 2000, the Department approved upward price adjustments to the contract totaling $12 million. The objective of this audit was to determine whether the D&D of the three buildings will be completed within the current contract price and on schedule.

RESULTS OF AUDIT

BNFL is not on track to complete the D&D of buildings K-29, K-31, and K-33, within the current contract price or on schedule. As of March 2000, BNFL had incurred 61 percent of the costs associated with the current value of its contract, but it had completed only 14 percent of the project. The audit disclosed that BNFL's management team was ineffective. We found that the contractor had changed project management teams twice during the first two years of the contract and has been slow to identify and correct significant problems. We noted, as well, that the Operations Office did not pay sufficient attention to BNFL's escalating project cost. In discussions during the audit, the contracting officer was not aware that BNFL's total project cost would be significantly higher than the contract price. To put the problem in perspective, we estimate the project will cost $94 million more than the current contract amount of $250 million and that completion is at least two years behind schedule. This estimate is based on the current scope of work and does not include uncertified requests for equitable upward price adjustments totaling $107 million, which BNFL has already submitted.

In our judgment, despite the importance of this project to the Department, its successful completion is uncertain. We base this conclusion on the following factors:

- The project cost overruns and schedule delays experienced to date:

- The fact that BNFL has already submitted price adjustments totaling about 46 percent of the original project contract value;

- Concerns regarding the effectiveness of management and oversight of the project at both the contractor and Federal levels; and,

- Questions previously raised by the Defense Contract Audit Agency as to BNFL's financial condition.

Although this report includes a number of recommendations designed to address many of these issues, it is clear that the D&D project at ETTP requires close scrutiny and attention by the Department's senior management.

During the course of the audit, we also noted that BNFL did not perform accurate surveys of contaminated metals before the contractor released the metals for recycling on the open market. We found that employees who performed the surveys were not adequately supervised. As a result, there was increased risk to the public that contaminated metals were released from the site, a condition that, obviously, was contrary to the Department's objectives when it established this program. In an action unrelated to this report, in July 2000, at your direction, the Department terminated further sales of these metals.

MANAGEMENT REACTION

Management concurred with the findings and recommendations.

cc: Deputy Secretary
Under Secretary

THE DECONTAMINATION AND DECOMMISSIONING CONTRACT AT THE EAST TENNESSEE TECHNOLOGY PARK

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OVERVIEW

INTRODUCTION AND OBJECTIVE

The East Tennessee Technology Park (ETTP), formerly known as the K-25 Site, contains about 400 buildings and 4,700 acres on the Oak Ridge Reservation. The K-25 Site was established in 1942 to produce enriched uranium. Since the production mission ended in 1987, the Oak Ridge Operations Office (Operations Office) has focused on environmental management of the site.

In August 1997, the Operations Office entered into a $238 million fixed-price contract with BNFL, Inc. (BNFL) to decontaminate and decommission (D&D) three large uranium enrichment buildings (K-29, K-31, and K-33). According to the contract, BNFL was also to recycle or dispose of the materials in the buildings and make the buildings available for commercial reuse by September 2003. The buildings cover 96 acres and contain an estimated 129,000 tons of potentially reusable metal from process equipment. The contract is the largest D&D project ever undertaken by the Department.

The objective of this audit was to determine whether the D&D of Buildings K-29, K-31, and K-33 will be completed within the current contract price and on schedule.

CONCLUSIONS AND OBSERVATIONS

BNFL was not on track to complete the D&D of Buildings K-29, K-31, and K-33 within the current contract price or on schedule. As of March 2000, BNFL had incurred 61 percent of the current contract price and completed only 14 percent of the project. This condition occurred primarily because BNFL's management team was ineffective. In addition, the Operations Office did not provide sufficient oversight of BNFL's project cost. As a result, the project will cost an estimated $94 million more than the current contract amount and be completed at least 2 years behind schedule.

In addition, BNFL did not perform accurate surveys of contaminated metals before it released the metals for recycling on the open market. Employees who performed the surveys were not adequately supervised. As a result, there was an increased risk to the public that contaminated metals were released.

The audit identified issues that management should consider when preparing its yearend assurance memorandum on internal controls.

(Signed)
Office of Inspector General

PRICE INCREASES AND SCHEDULE DELAYS

BNFL Was Not on Track to Complete D&D Within the Contract Price or on Schedule

BNFL was not on track to complete the D&D of Buildings K-29, K-31, and K-33 within the current contract price or on schedule. The current contract price consists of the original award ($238 million) plus the price adjustments awarded through June 2000 ($12 million). As of March 2000, BNFL had incurred 61 percent of the cost value of the current contract price and had completed only 14 percent of the project.[1] These buildings were divided into a total of 17 units. Based on the original schedule, six of the 17 units should have been completed as of June 2000, however, only one unit was completed. Also, the most difficult part of the project was yet to be completed. Specifically, 95 percent of the largest and most cumbersome pieces of equipment, converters, were not dismantled. As of the beginning of June 2000, BNFL had dismantled only 83 of the 632 converters in Building K-33 and had not begun dismantling any of the converters in Buildings K-29 and K-31. Currently, BNFL dismantles an average of five converters per week. At this rate, the project will not be complete before January 2006, which is more than two years after the original scheduled completion date.

BNFL contends that the contract will be completed on time, and only the costs associated with changes to the original work scope outside of the contractor's control (i.e., storm-related damages to equipment, the Department's January 2000 moratorium on the release of recycled nickel, and material volumes that were larger than expected) will result in price increases to the Government. Thus, BNFL believed that the Department was responsible for many of the conditions and circumstances that affect project cost and schedule. As a result, BNFL submitted eight uncertified requests for equitable price adjustments totaling $107 million. It also discussed its intention to pursue an additional adjustment of $40 million attributable to the Department's moratorium on the release of recycled nickel.

Fixed-Price Contracts Play a Key Role in the Department's Cleanup Goal

The Department established a goal to complete cleanup activities at more than 90 percent of its sites by 2006. Contract reform, including using more competitively awarded fixed-price contracts, was expected to play an essential part in achieving this goal. The Department believed that contract reform offered the potential to reduce cleanup project life-cycle cost. Specifically, the Department believed that the increased use of fixed-price contracts would achieve more efficient cleanup and significant savings. Fixed-price contracts place full responsibility for all costs and the resulting profit or loss on the contractor which reduces the risk to the Government.

[1] Because this was a fixed price contract with a milestone payment schedule — paid as segments of the buildings were completed — DOE had paid about 20 percent of the $250 million current contract price as of March 2000.

The BNFL contract dominates the D&D Fund appropriation for the Oak Ridge Reservation, and ultimately drives the "critical path" for the Operations Office's ongoing cleanup program. The contract requires the buildings to be available for commercial reuse by September 2003. The Department awarded this contract to BNFL without full and open competition. The justification for reduced competition cited BNFL's ability to call upon the expertise of its parent company, British Nuclear Fuels plc, which had previously decommissioned a uranium enrichment plant. BNFL's proposal for the project was attractive to the Operations Office for several reasons, including the fact that BNFL was responsible for financing much of the work, and that BNFL claimed to have a patented treatment process to decontaminate commercially valuable nickel and sell it on the open market for private sector reuse.

BNFL's Management Teams Were Ineffective

Cost increases and schedule delays occurred primarily because of ineffective management. BNFL acknowledged responsibility for some of the problems encountered in the early stages of the project, stating that it had difficulties in managing the "ramp up" of such a large workforce and project. BNFL changed project management teams twice during the first two years of the contract. The first change occurred in May 1998 and involved six upper-level management personnel, including the project director, operations cutting manager, and waste operations manager. The second change occurred in August 1999 and involved all key personnel: the general manager (project director and project manager); removal operations manager; waste operations manager; environmental safety, health and quality manager; and the administration manager.

BNFL was slow to identify and correct significant problems. For example, BNFL had recurring safety problems. In April 1999, BNFL shut down operations voluntarily due to multiple safety concerns and an employee lost-time accident and did not completely restart work until six weeks later. When the shutdown occurred, BNFL had about 600 employees working on the project. All of the employees reported to work during the shutdown period. During the shut down period, employees underwent additional safety training and work procedures were revised. BNFL voluntarily shut down operations again in April 2000 for over two days due to a fire and fissile safety concerns. Despite the shutdowns, safety training, and revised work procedures, BNFL recorded 33 injuries to employees working on the project in the 17 months ended May 2000. However, BNFL's recordable injury rate significantly improved during FY 2000.

BNFL management also discussed and analyzed for more than a year the concept of building and operating a super-compactor to speed up the D&D process. Use of a super-compactor would have allowed large amounts of metal to be compacted instead of cut into pieces, and would have decreased the volume of waste sent for disposal. The decision was finally made in May 1999 to build the super-compactor, but it will not be fully operable until December 2000.

Because of the schedule delays, the Operations Office directed BNFL to submit a project recovery plan by February 28, 2000. The recovery plan was supposed to contain detailed work activities, critical completion factors, and work activity sequencing to show how BNFL will get the project back on schedule. As of June 2000, BNFL had not submitted a complete project recovery plan. The document submitted by BNFL consisted of a revised schedule without addressing any work improvements that needed to be made. Until a complete project recovery plan is submitted, it will be difficult to determine whether BNFL can get the project back on schedule.

Operations Office Did Not Provide Sufficient Oversight

The Operations Office did not provide sufficient oversight of BNFL's project cost, and the contracting officer was not aware that the total project cost would be significantly higher than the contract price. Prior to award of the contract, DCAA reported that BNFL's financial condition was unsatisfactory and that it had a probable chance of experiencing future financial distress which could jeopardize its ability to continue performing on contracts. As a result, the Operations Office required BNFL to secure a bond to guarantee project completion, one unit at a time. In addition, the Operations Office's project manager was required to notify the contracting officer of any indication that the cost to the Government would exceed the amount stated in the contract. Although the project manager received quarterly project cost reports, the project manager never formally notified the contracting officer that BNFL's total project costs would be significantly higher than the contract price. The project manager believed the Government's risk was minimal because the contract was awarded for a fixed price.

During the course of the audit, the Operations Office acknowledged that additional oversight was needed. In March 2000, the Operations Office added a claims manager, a legal advisor, and two technical personnel to the project. The additional personnel will support cost control by documenting daily work processes. The documentation will be used to assist the contracting officer in evaluating the validity of BNFL's requests for equitable price adjustments.

Project Will Cost $94 Million More Than the Current Contract Amount and Take 2 Years Longer Than Planned

As a result of ineffective management of the project, we estimate the project will cost BNFL at least $344 million, which is $94 million more than the current contract amount of $250 million. The estimate was based on the current scope of work and does not include BNFL's requests for equitable price adjustments. BNFL stated that as a result of its initial poor performance on the contract, it would incur almost $100 million in additional cost, which will not be recovered from the Government. However, BNFL has already submitted uncertified requests for equitable adjustments totaling $107 million and expressed its intention to pursue an additional $40 million. The Department stated that it is highly unlikely it will actually pay the full amount of BNFL's uncertified requests, although it does admit the extent of certified requests could be substantial. Further, at the current work pace, the project will not be completed until at least two years after the original completion date.

RECOMMENDATIONS

We recommend that the Manager, Oak Ridge Operations Office:

1. Direct BNFL to provide a complete project recovery plan by October 2000, detailing how it will complete the project within the current contract price and schedule.

2. Direct Operations Office personnel to:

    a. Closely monitor BNFL contract cost and notify the CO of any indication that the cost to the Government will exceed the amount stated in the contract.

    b. Ensure that equitable price adjustments are not awarded to compensate BNFL for management inefficiencies.

    c. Apply lessons learned from the BNFL contract to future fixed-price contracts.

MANAGEMENT REACTION

Management concurred with the finding and recommendations. Management stated that it would issue a letter by September 12, 2000, directing BNFL to submit a complete project recovery plan by October 2000.

With respect to recommendation 2a, management stated that under a fixed-price contract the project manager, the CO, and the contract administrator are not allowed access to or provided any detailed information regarding the contractor's financial reports or books.

The only general project cost information the Department receives from the contractor is contained in quarterly status reports. The information contained in the status reports was considered inadequate for making decisions regarding project costs or the contractor's financial condition. In addition, management stated that the project manager provided copies of the quarterly reports to the CO and discussed BNFL's reported contract termination liability as well as BNFL's uncertified requests for equitable adjustments. Finally, the CO ensured that adequate funding was obligated to cover contract requirements in the case of contract termination.

Regarding recommendation 2b, management stated that it had been and would continue ensuring that equitable price adjustments were not awarded to compensate BNFL for management inefficiencies.

With respect to recommendation 2c, management stated that it would prepare and forward to other D&D projects a report of lessons learned on an ongoing basis.

AUDITOR COMMENTS

We consider Management's comments to be responsive. We agree that Operations Office personnel monitored BNFL's reported termination liability, uncertified requests for equitable adjustments and contract funding amounts and had not awarded any equitable adjustments that compensated BNFL for management inefficiencies. However, despite DCAA's warning about BNFL's unsatisfactory financial condition, Operations Office personnel did not use the project cost information that was available to them to monitor project costs (using the amounts contained in BNFL's proposal) versus project progress. In the absence of this type of analysis, the CO was not aware of the expected significant increase in total project costs exclusive of BNFL's requests for equitable adjustments. Also, we believe the magnitude of BNFL's requests for equitable adjustments, the estimated project cost increases, and BNFL's financial condition, warrant management paying close attention to the equitable price adjustment process to ensure that no adjustments are awarded to compensate BNFL for management inefficiencies.

METAL SURVEY ERRORS

Recyclable Metal Must Be Surveyed to Determine If It Is Safe for Release

BNFL's contract allows it to sell salvageable metal (excluding nickel) on the open market to recover some of its costs. However, BNFL must survey the metal to ensure that it meets Department Order 5400.5 criteria prior to release. Department Order 5400.5 states that for the isotopes of concern (uranium and technetium), all surface contaminated materials with activity levels exceeding 5,000 disintegrations per minute per 100 centimeters squared (dpm/100 cm^2) averaged over a square meter or a maximum of 15,000-dpm/100 cm^2 at a single point cannot be approved for release on the open market. BNFL established an administrative limit of 5,000-dpm/100 cm^2 at a single point. Since BNFL's administrative limit does not allow for averaging over a square meter, the acceptable activity level is much more conservative than that allowed by the Department.

As part of the process, before BNFL surveys a particular lot of metal, it assigns the material to one of three classification levels utilizing process knowledge and field evaluations. This classification system is based on the Multi-Agency Radiation Survey and Site Investigation Manual. This system dictates the minimum amount of surface area in each lot that must be surveyed depending on the classification of the material. Class I material is known or expected to contain contamination above the Department's release criteria; therefore, 100 percent of each lot must be surveyed. Class II material is known or expected to contain contamination below the release criteria; thus, between 10 and 100 percent of each lot must be surveyed. Class III material is expected to contain little or no contamination, and about 10 percent of each lot must be surveyed.

BNFL's Survey Results Were Inaccurate

As the final step to the release process, the Operations Office hired an independent verification team to verify that BNFL was properly surveying recyclable metal. Through May 2000, the verification team tested 639 lots of metal that BNFL had surveyed and determined to be appropriate for release. The team found that 22 lots exceeded the administrative limit. Of the 22 lots, 2 exceeded the Department release criteria. In several cases, the differences between BNFL's and the team's survey results were significant. For example, in the beginning of the project, BNFL surveyed a lot containing lube oil pipe at 530-dpm/100 cm^2; however, the verification team determined that the metal had an activity level of 110,000. In a more recent case, a lot consisting of pipe supports at 1,973 by BNFL, but the verification team determined the metal had an activity level of 16,000.

The percentage of lots the verification team rejected based on BNFL's administrative limit due to BNFL's surveying errors almost doubled from 1.8 percent to 3.4 percent in the 4 months ended May 2000. As a result, on May 29, 2000, BNFL issued a temporary stop-work order concerning all surveying activities.

Survey Personnel Lacked Adequate Supervision

Many of the results of metal surveys that have been documented to date as being inaccurate were a result of BNFL employees who performed the surveys not being adequately supervised. It has been noted that BNFL experienced significant turnover in survey supervisors. This large management turnover affected training and continuity with the BNFL survey program and was creating potential systematic problems with the release process. Specifically, the knowledge which the supervisors obtained concerning the areas of material most likely to contain contamination as well as recurring problem areas would have been lost unless BNFL documented the information in work records and then required every new supervisor and every new survey technician to review those records. BNFL, however, was not documenting recurring problem areas and thus did not initiate corrective actions on a trending basis. For example, the verification team reported problems with transformer surveys to BNFL in September 1999. The team then found three more lots where BNFL personnel incorrectly surveyed transformer activity levels in December 1999, February 2000, and April 2000. The verification team also reported that problems were occurring with supply duct surveys in February 2000. During the next two months, the team identified four additional lots that exceeded the release criteria.

Risk of Release of Contaminated Metals Increased

As a result of inaccurate surveys, the risk to the public that contaminated metals were released from the site was increased. Since the verification team does not verify every item in each lot, additional surveying errors would not be detected, and in some cases, lots exceeding the release criteria may have been released. As of the end of May 2000, about 6.6 million pounds of unrestricted metal were released for recycling from the site. To date, no instances of contaminated metal have been reported by recipients of the recycled metal.

Although unrelated to our report, the Secretary of Energy suspended the release of potentially contaminated scrap metals for recycling from Department nuclear facilities effective July 13, 2000.

RECOMMENDATIONS

We recommend that the Manager, Oak Ridge Operations Office, require BNFL to:

1. Ensure that personnel performing metal surveys are adequately supervised, and

2. Monitor the quality of surveys performed by BNFL employees and initiate corrective actions as needed.

MANAGEMENT REACTION

Management concurred with the finding and recommendations. Management stated that the corrective actions taken by BNFL subsequent to its voluntary stop-work action on May 29, 2000, added lines of defense to ensure that no materials are released above the Department's release criteria. For example, BNFL conducted an internal audit of its entire survey and release process that resulted in procedural updates, additional training, and implementation of added steps prior to release of material for verification. BNFL is also implementing a real-time auditing procedure consisting of intentionally placing a known source of radiation within a lot of metal to evaluate the effectiveness of its survey program. The source of radiation is removed before allowing the material to be transported from the contamination area. Finally, issues identified by the verification team will now be handled at BNFL's management level rather than by floor level personnel as was done in the past.

AUDITOR COMMENTS

The corrective actions cited by management are considered responsive. However, the reliability of BNFL's recently added survey process controls cannot be verified since the actions were taken after the audit fieldwork was completed and after the voluntary stop-work action.

SCOPE

The audit was performed from February 22 to June 8, 2000, at the Operations Office and the ETTP. The scope of the audit included costs incurred and progress made on the D&D contract from August 1997 through June 2000.

METHODOLOGY

To accomplish the audit objective, we:

- Evaluated BNFL's contractual requirements and performance through June 2000;
- Reviewed Federal and Department regulations governing contract management and metal recycling;
- Examined procurement and project files;
- Evaluated the adequacy of the Operations Office's project oversight;
- Analyzed the costs associated with the D&D activities;
- Conducted walk-throughs of facilities; and
- Held discussions with Department and contractor personnel regarding D&D activities.

The audit was performed in accordance with 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. Accordingly, the assessment included reviews of costs incurred and progress made on BNFL's D&D contract for Buildings K-29, K-31, and K-33. 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 conduct a reliability assessment of computer-processed data because only a very limited amount of computer-processed data was used during the audit.

As part of our review, we evaluated the Operations Office's expectations and performance measures for the D&D contract for Buildings K-29, K-31, and K-33. Although the Department established performance measures in accordance with the Government Performance and Results Act of 1993, BNFL was not meeting the performance measures as discussed in the body of the report.

We held an exit conference with the project manager for BNFL's contract, Oak Ridge Operations Office, on September 5, 2000.

RELATED OFFICE OF INSPECTOR GENERAL REPORTS

- *Audit of the Decontamination and Decommissioning at the East Tennessee Technology Park* (ER-B-99-01, December 1998). The report concluded that the Operations Office did not fully emphasize reductions of health, safety and environmental risks when it selected projects to D&D. Specifically, the Operations Office's contract with BNFL did not involve Building K-25, the facility that posed the greatest risk from exposure to radioactive waste, hazardous or toxic materials, and structural collapse. As a result, Building K-25 continued to deteriorate, and hazards to workers and the environment were increased. We estimated that the Department could incur $34.5 million in unnecessary surveillance and maintenance costs for Building K-25 between FYs 1998 and 2002. We recommended that the Operations Office prioritize its selection of D&D projects with a greater emphasis on reducing health, safety, and environmental risks for workers and the public. Management did not concur with the finding and recommendation; however, they did request additional funding in FY 2001 for the D&D of Building K-25.

- *Audit of the Deactivation, Decontamination, and Disposal of Surplus Facilities at the Savannah River Site* (ER-B-98-01, October 1997). We determined that the Savannah River Operations Office and Westinghouse Savannah River Company (Westinghouse) had not economically and promptly deactivated, decontaminated, and disposed of surplus facilities at the site. Specifically, Westinghouse only disposed of one facility and did not completely deactivate or decontaminate any of the 162 facilities identified as surplus in FY 1996. This occurred because the Savannah River Operations Office did not compile a site-wide list, establish priorities, or provide sufficient funding for the deactivation, decontamination, and disposal of surplus facilities. As a result, the Department incurred unnecessary costs for the surveillance and maintenance of surplus facilities. Management concurred with the finding and recommendations, and initiated corrective action.

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