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

Audit Report

Performance-Based Contract Incentives at the Hanford Site

DOE/IG-0739

September 2006

Department of Energy

Washington, DC 20585

September 20, 2006

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Audit Report on the "Performance-Based Contract Incentives at the Hanford Site"

BACKGROUND

In 2002, the Office of Environmental Management (EM) directed its field organization to ensure that the structure of environmental remediation contracts emphasized the completion of specific tasks. Many of these tasks were acknowledged to be aggressive and technologically challenging. As part of this initiative, EM's field activities at the Hanford Washington site, the Richland Operations Office (Richland) and the Office of River Protection (ORP), incorporated results-oriented work scopes in their contracts and increased the potential fees that the contractors could earn for completing especially challenging work. Richland, for example, accelerated work on at least ten major projects. It also increased the available fee pool of its contractor, Fluor Hanford, Inc., from approximately $127 million to $180 million for Fiscal Years 2003 - 2006. ORP took similar action by accelerating the schedule to cleanup waste tanks at the Hanford Site and included $72 million in performance incentives in its contract with CH2M HILL Hanford Group, Inc. (CH2M HILL) to accomplish this and other work.

Because of the extraordinary health and safety risks that exist at Hanford and the sizable commitment of funds for site environmental remediation, we conducted this audit to determine whether the Department of Energy (Department) had effectively implemented the performance-based incentives program at the Hanford Site.

RESULTS OF AUDIT

Although ORP and Richland intended for their performance-based contract incentives to be result-oriented, in certain cases, the work assigned to site contractors by these offices was not realistic or achievable. As a result, the Department's limited financial resources were applied to incentivize end-states that were not readily attainable; and, fees were paid for work that could not be completed. For example,

- ORP established an incentive to retrieve and treat transuranic tank waste, and begin shipping the waste from Hanford to the Waste Isolation Pilot Plant in June 2005. The incentive was established despite significant, known regulatory barriers beyond the control of the contractor to achieving the desired end state. Ultimately, the Department was not able to overcome these barriers. Work on the project was stopped in April 2005. The contractor was reimbursed for the work it performed and received an incentive fee for its efforts.

- Similarly, Richland directed a site contractor to ship excess plutonium from Hanford's Plutonium Finishing Plant (PFP) to an approved interim storage facility. The goal was to make PFP demolition-ready which would allow Hanford to reduce security costs. However, the Department did not have a comprehensive program in place to consolidate the material and subsequently found it necessary to postpone the shipment. Because of contractual requirements, the Department was obligated to pay the contractor for its efforts and to grant it a significant incentive fee for an assignment which, in effect, the contractor could not complete.

To its credit, the Department's intentions were to encourage contractors to become more aggressive in their schedule and to look for more efficient ways of completing the work. However, in structuring work assignments and performance incentives, the Department did not adequately consider key factors affecting the likely outcome, including technological challenges, regulatory barriers, and other external actions or requirements for which the contractor could not realistically be held accountable.

We also found that the Department did not always react in a timely manner to restructure the affected contractor performance incentives once it recognized that incentivized projects could not be completed. We found that the primary cause of this problem was a cumbersome incentive change control process.

Our analysis showed that because of these problems, the Department was not able to maximize the amount of successful cleanup work possible within available funding constraints. We noted, for example, that the Department was slow to reorient funds available for incentive fees to accelerate other high priority work at the Hanford site.

In order to reduce these risks in the future, we recommended that the Department place greater emphasis on evaluating the probability for success when establishing project performance incentives and enhancing the contract-fee-change process to ensure that incentive fees are realigned in a timely and effective manner.

MANAGEMENT REACTION

Management agreed with our recommendations, but disagreed with several conclusions made in the report. Specifically, management stated that classifying the incentives as unrealistic or unachievable is misleading and belies the Department's objective of linking aggressive incentives with improved project performance. Management further stated the Department did not pay for work that was not accomplished. Fee was paid for completed work for which the project end state was no longer achievable.

Establishing effective contractor performance incentives is not easy business, especially in dealing with a program as complex as the Department's environmental remediation effort. We acknowledge, as well, that stretch goals and enhanced incentives, in some cases, have increased contractor performance at Hanford. However, as is stressed in the report, a number of established contractor incentives were essentially unachievable from the start because of factors outside the control of the contractor. Further, we disagree with the underlying premise of management's contention that fee was paid for completed

work for which the project end state was no longer achievable. At the time work scopes and fees were established, management's own analysis of the probability of success showed that the majority of tasks assigned to the site contractors had a 5 to 50 percent chance of being successful. In the future, identification of possible barriers to success upfront would facilitate the most effective application of available funding.

Management's verbatim comments and our detailed responses are included as Appendix 3.

Attachment

cc: Deputy Secretary
Under Secretary for Energy
Chief of Staff
Assistant Secretary, Office of Environmental Management
Manager, Office of River Protection
Manager, Richland Operations Office

REPORT ON PERFORMANCE-BASED CONTRACT INCENTIVES AT THE HANFORD SITE

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PERFORMANCE-BASED INCENTIVES

Implementation of Performance-Based Incentives

The Department of Energy (Department) did not always implement performance-based incentives at the Hanford Site (Hanford) in an effective manner. While the performance incentives were measurable and outcome-oriented, a number of incentives were not realistic or achievable. In addition, once it was determined that the incentives could not be achieved within the contract period because of factors beyond the control of the contractor, the Department did not respond in a timely manner to reallocate the incentive fee to other projects that could be achieved.

Fluor Hanford Incentives

Several projects incentivized for Fluor Hanford, Inc. (Fluor Hanford), had a low probability of success according to Department assessments. The Richland Operations Office (Richland) determined that the end state for seven projects, which were incentivized at $110 million, had a 50 percent or less probability for success. This represented about two-thirds of the available fee pool. The probability reflected the technical risk of the project, the anticipated funding available to achieve the work, and the contractor's past performance.

For example, in Fiscal Year (FY) 2003, Richland established an incentive of $7.2 million to ship the surplus plutonium from Hanford's Plutonium Finishing Plant (PFP), to an interim storage facility -- although it had a 50 percent probability of success. Subsequently, in February 2005, the Department postponed shipment of the material from Hanford since it did not have a comprehensive program in place to consolidate the material at an interim storage facility. Specifically, the Department did not have storage space available to receive the material from Hanford, a factor outside the control of Fluor Hanford. Accordingly, Fluor Hanford was not able to achieve the objective for which the incentive had been established.

The Office of Environmental Management (EM) stated that plutonium stabilization and packaging was the most critical part of the PFP incentive and that shipment of the plutonium was important in order to lower life-cycle costs. Although Richland believed that it achieved at least 95 percent of the work scope associated with the plutonium shipment, it had not realized the purpose of the incentive to remove the plutonium from the PFP so that it could be put into a demolition-ready state, thereby reducing the facility and security costs.

Also, Richland established a $40 million incentive to remove all spent nuclear fuel, sludge, debris, and water from the K-Basins, as well as deactivate the Cold Vacuum Drying Facility and all ancillary facilities in the 100K Area by October 2005, even though the project only had a five percent probability of success. In making this determination, Richland officials believed that the mandated acceleration was unlikely to be achieved, and past performance failures by Fluor Hanford suggested that the improvements necessary to support this acceleration were not likely to be sufficient. Nonetheless, Departmental officials mandated that the schedule be accelerated even though the project is one of the most technically complex cleanup projects in the Department. Based on current estimates, EM does not anticipate completing sludge removal operations at Hanford until November 2009 -- or four years after the originally incentivized schedule. Although the project had such a low probability of success, neither the Department nor Fluor Hanford provided adequate attention to planning for sludge removal.

CH2M HILL Incentives

In addition, the Office of River Protection (ORP) at Hanford established incentives for CH2M HILL Hanford Group, Inc. (CH2M HILL), on two major projects that were not realistic due to existing regulatory concerns and overly optimistic schedules. For example, ORP established an $8 million incentive to retrieve and treat transuranic tank waste, and to begin shipping the waste from Hanford to the Waste Isolation Pilot Plant in June 2005. However, ORP was aware as early as 2003, when the incentive was formulated, that there were significant regulatory barriers to its success that were beyond the contractor's control. Ultimately, the Department was not able to resolve these barriers and stopped work on the project in April 2005 because the necessary permits had not been acquired -- a factor beyond the contractor's control.

In the second case, ORP provided CH2M HILL incentives of $26.7 million to retrieve waste from 22 single-shell tanks and for interim closure of eight tanks by the end of FY 2006. Although this incentive did result in the Department accelerating the retrieval of waste from tanks; as of May 2006, it had fully retrieved waste from only four tanks and had revised its baseline for completing the retrieval to March 2007.

Incentive Modifications

Once the Department recognized that incentive objectives could not be achieved, it did not react in a timely manner to reallocate incentives to other projects. For example, Richland officials waited to renegotiate a number of changes at one time rather than as changes occurred. This resulted in multiple incentive modifications, including changes to the PFP and K-Basin sludge removal projects, not occurring until at least 18 months after Richland estimated that there was a low probability of success. Additionally, ORP did not eliminate the work scope associated with the transuranic mixed waste project when it recognized that there were significant regulatory barriers beyond the contractor's control that would make success of the project unlikely.

Pay for Performance

The Department's strategy was to pursue the incentives that would encourage contractors to become more aggressive in their schedule and look for more efficient ways of completing the work. Nonetheless, project success relied on additional key factors which, in our opinion, should have been considered in establishing the incentives, such as regulatory and permitting concerns and nuclear material consolidation program issues that were beyond the control of contractors. Despite the impact of potentially intervening factors, ORP did not perform an evaluation of the probability of success for the incentives it established. Richland performed this analysis, but did not factor the results into the establishment of incentives associated with meeting certain end-states. Rather than giving adequate consideration to these issues prior to establishing the incentives, Department officials chose to establish stretch goals and rely on negotiations to determine the appropriate compensation for contractor performance once it was known that the project could not be completed as planned.

We noted additionally that the Department's change control process for performance-based incentives was cumbersome and did not allow the Department to react in a timely manner once it recognized that incentive objectives could not be achieved. The current change control process is centralized and requires approval from two separate Office of Environmental Management committees, as well as the Assistant Secretary for Environmental Management before changes can occur. All proposed changes are reviewed by the Contract Management Advisory Council and require approval by the Office of Environmental Management's Configuration Control Board. Further, the Assistant Secretary for Environmental Management centrally manages, controls, and

approves Configuration Control Board actions. This change control process did not allow contracting officers and site managers the ability to manage day-to-day contract decisions.

Performance Not Achieved

As a result, the Department missed opportunities to use incentive funds to accelerate other work at the site that was realistic or achievable. For example, incentive funds could have been directed to other needs such as decommissioning wells at the Hanford Site. As we reported in *Well Decommissioning Activities at the Hanford Site* (DOE/IG-0670, January 2005), additional action is needed to reduce the risk associated with potential contamination from unused wells at the site that need to be decommissioned. Furthermore, the Department paid incentive fees to contractors without achieving the end states it sought to attain. For example, the Department:

- Paid Fluor Hanford $6.4 million for work scope related to the PFP, but did not achieve one of its primary goals - shipping plutonium to the Savannah River Site to reduce security costs at the PFP;

- Agreed to a settlement of $18.7 million for other Fluor Hanford requests for equitable adjustments for incentive fees; and,

- Paid a settlement of more than $8 million to CH2M HILL for the contractor's requests for equitable adjustments regarding incentive fees. The settlement modified incentives for the transuranic mixed waste project without achieving the original objective of retrieving, treating, and disposing of the waste.

By not ensuring that incentives were applied to achievable goals, the Department is at risk of not realizing the maximum amount of cleanup work possible from available funds.

RECOMMENDATIONS

To address the issues discussed in this report, we recommend that the Assistant Secretary for Environmental Management:

1. Appropriately evaluate the projects' probability for success when establishing performance incentives; and,

2. Reevaluate the contract fee change and review process to determine if the current structure is providing timely results and to consider allowing greater authority to the field to adjust and realign incentives, in a timely manner, as circumstances change.

MANAGEMENT REACTION AND AUDITOR COMMENTS

Management agreed with our recommendations, but disagreed with several conclusions made in the report. The Richland Operations Office and Office of River Protection also indicated that they implemented the first recommendation before the audit was conducted. Management's specific comments, followed by our responses, are noted below.

Management Comment

Management stated that our conclusion that the incentives were not realistic or achievable is misleading. Management recognized that many of the incentives were extremely challenging, but they were directly responsible for the successes pointed out in the report. Management stated that it made a conscientious decision to encourage contractors to look for more efficient ways to safely accelerate and complete work. The Office of Environmental Management stated that the total amount of work scope that will be completed under challenging incentives is unarguably greater than the amount of work scope that could be reasonably expected to be achieved under incentives with a greater probability of success. Management also stated that, while the probability of success was low for many of the projects, it correctly established a fee pool commensurate with that risk.

Auditor Response

We recognize that the Department established incentives that were extremely challenging and were intended to encourage contractors to look for more efficient ways to accelerate work. However, in our view, a number of incentives were not realistic because of factors outside the control of the contractor. Although it established a fee pool it believed was commensurate with the additional risk associated with acceleration, the contractors' ability to earn the fee was, in some cases, determined by risk factors associated with the Department's ability to deliver government-furnished services and items. For example, the Office of River Protection did not provide the necessary regulatory and permitting deliverables for the transuranic mixed tank waste project. As a result, the Office of River Protection stopped work on the transuranic mixed tank waste project and settled a request for equitable adjustment with the contractor.

Management Comment

Management stated that our conclusion that the Department paid incentive fees for some work scope that was not accomplished was not true. While fees were paid for completed work for which the end-state was no longer achievable, the payment was based on the percentage of work completed toward the achievement of the planned end-state.

Auditor Response

While there are instances where it may be appropriate for the Department to pay fees based on the percentage of work completed, this practice is not contractually consistent with the incentives that were established in the Fluor Hanford and CH2M HILL contracts. Many of the incentives in these contracts were structured such that the Department would pay only if the end-state was completed. For example, the PFP incentive called for the shipment of excess plutonium to an approved interim storage facility. This was not accomplished.

In total, approximately half of the accelerated performance-based incentive fees established by the Department at Hanford were provisional and could only be retained by the contractor if the end-state was completed. However, after establishing the incentives, the Department made a unilateral determination to allow the contractors to retain provisional fees even though the end-states were never achieved through no fault of the contractor. Consequently, Fluor Hanford received equitable adjustment payments and had other fee reallocated to other work. Paying on a percent complete basis defies the end-state incentive concept.

It should be noted that in two cases, payments under the new accelerated fees actually paid the contractor more for accomplishing less than what the prior non-accelerated incentives required. Prior to the acceleration incentives, Fluor Hanford was required to treat and dispose of approximately 9,820 cubic meters of mixed low-level waste for $7.75 million in fee. Ultimately, Fluor Hanford treated and disposed of approximately 6,350 cubic meters of mixed low-level waste and was paid about $9.25 million in performance-based incentive fees. In another instance, the pre-acceleration incentives called for Fluor Hanford to dispose of 3,234 cubic meters of suspect transuranic waste for $6.4 million in performance-based incentive fee. Under the new accelerated incentives, Fluor Hanford was paid $14.1 million for the disposition of approximately 3,360 cubic meters of suspect

transuranic waste. As a result, Fluor Hanford received over twice the compensation for completing four percent more work. The Richland Operations Office Manager asserted that Fluor Hanford took on more risk by waiving assumptions and government-furnished items listed in earlier performance incentives. Based on our limited review of the data, we could not validate the Richland Operations Office Manager's assertion.

Management Comment

Management stated that the Richland Operations Office and Office of River Protection had implemented the first recommendation -- to appropriately evaluate the projects' probability for success when establishing performance incentives -- before the audit was conducted.

Auditor Response

While we appreciate that the Office of Environmental Management agreed with the recommendations, we disagree that both the Richland Operations Office and Office of River Protection had already implemented the first recommendation. As noted in the body of the report, while the Richland Operations Office evaluated the projects' probability of success; it did not fully consider risk factors -- such as regulatory barriers or nuclear material consolidation issues -- that were beyond the contractors' control. In the case of the Office of River Protection, it performed no risk analysis of the work that was incentivized Therefore, the Office of River Protection had no way of determining whether the work scope assigned to the contractor was realistic or achievable.

Appendix 1

OBJECTIVE

The objective of this audit was to determine whether the Department had effectively implemented performance-based incentives to accelerate cleanup at the Hanford Site.

SCOPE

We conducted the audit from April 2005 to March 2006, at the Hanford Site in Richland, Washington. The scope of the audit covered the Richland Operations Office and the Office of River Protection's performance-based incentives.

METHODOLOGY

To accomplish the audit objective, we:

- Obtained and reviewed planning documents for performance-based incentives;
- Researched Federal and Departmental regulations;
- Reviewed findings from prior audit reports regarding performance-based incentives;
- Analyzed the Fluor Hanford, Inc., contract with the Richland Operations Office;
- Analyzed the CH2M HILL Hanford Group, Inc., contract with the Office of River Protection; and,
- Interviewed key personnel in the Richland Operations Office, Office of River Protection, and the Office of Environmental Management.

The audit was conducted 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. We assessed internal controls established under the Government Performance and Results Act of 1993 related to the Richland Operations Office and Office of River Protection's performance-based incentives at the Hanford Site. 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 a limited amount of computer-processed data was used during the audit.

We held an exit conference with management on June 26, 2006.

PRIOR AUDIT REPORTS

- *Management Controls over the Hanford Site Transuranic Mixed Tank Waste* (OAS-M-06-01, November 2005). The Department of Energy (Department) had not addressed regulatory and permitting issues prior to proceeding with the transuranic mixed tank (TRUM) waste project. The Office of River Protection initiated the project and incentivized the contractor to complete work without fully addressing issues related to obtaining the necessary permits to retrieve, treat, and dispose of the waste, or completing regulatory actions required under the *National Environmental Policy Act of 1969* (NEPA). In addition, the Office of River Protection did not resolve the State of New Mexico Environmental Department concerns about disposing of the waste at the Waste Isolation Pilot Plant because it had previously been managed as high-level waste; State of Washington Department of Ecology concerns about permitting the retrieval, treatment, and temporary storage of the waste until there was an approved geologic repository; or the Office of Environment, Safety and Health issues regarding the NEPA supplemental analysis for the TRUM project.

- *Accelerated Tank Waste Retrieval Activities at the Hanford Site* (DOE/IG-0706, October 2005). The audit disclosed that, in terms of both schedule and cost, the Department will not meet its Tri-Party Agreement milestone for the retrieval of waste from the single-shell tanks located in the C-Farm. The Department was overly optimistic about its ability to retrieve tank waste and it had not based its approach on sound retrieval experience and proven retrieval technologies. While the audit focused on activities at the C-Farm, the findings have broader implications for the entire tank waste cleanup effort. Specifically, as a result of tank waste retrieval delays and cost overruns, the Department's ability to meet its Agreement milestone of removing waste from all single-shell tanks by 2018 is in jeopardy.

- *Sludge Removal Operations at the Hanford Site's K Basins* (DOE/IG-0698, September 2005). The audit found that the sludge removal operations are behind schedule and over budget. This occurred, in part, due to the fact that the Department has not structured performance fees to effectively incentivize relevant project activities. As such, milestones may be missed and cost overruns could impact the Department's ability to further accelerate cleanup work at Hanford. In fact, the work scope can no longer be completed within the contractor's existing contract and Richland estimates the work will not be completed until October 2007.

- *Use of Performance Based Incentives by the Office of Civilian Radioactive Waste Management* (DOE/IG-0702, September 2005). The Office of Civilian Radioactive Waste Management (OCRWM) paid incentive fees even though the contractor did not meet performance expectations. OCRWM paid fees even though the contractor exceeded deadlines and failed to produce quality work, work scope was reduced due to poor performance, and products did not meet quality standards. The contractor also received fee for work that was not performed. Further, incentivized work was eliminated due to contractor performance concerns. This occurred because OCRWM did not establish adequate quality assurance plans.

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United States Government **Department of Energy**

memorandum

DATE: May 17, 2006

REPLY TO ATTN OF: EM-42 (Steve Schneider, 301-903-7198)

SUBJECT: Draft Report on "Richland Operations Office and Office of River Protection Performance-Based Contract Incentives"

TO: George W. Collard, Assistant Inspector General for Performance Audits, Office of Inspector General

This is in response to your April 14, 2006, memorandum regarding the review of the draft audit report on "Richland Operations Office and Office of River Protection Performance-Based Contract Incentives."

The report makes two recommendations and provides several conclusions resulting from the audit. The report recommends that the Office of Environmental Management (EM) evaluate the projects' probability of success when establishing performance incentives, and reevaluate the change and review process for contract fees and incentives. We agree with these two recommendations. In fact, the Richland Operations Office and the Office or River Protection had already implemented the first recommendation before the audit was conducted.

With regard to the conclusions, we agree with some, but have significant disagreements with others. EM agrees with the conclusions that the Hanford performance incentives were measurable and outcome-oriented and that the Department achieved benefits from its aggressive incentivization approach that it would not otherwise have achieved. However, the conclusion that the Department established incentives that were not realistic or achievable is misleading and belies our objective of linking aggressive incentives with improved project performance. We understand that many of our incentives are extremely challenging, but they are also directly responsible for our successes, as your report points out. In addition, the report concluded that the Department paid for some work scope that was not accomplished. This is not true. Fee was paid for completed work for which the project end state was no longer achievable. The payment was based on the percentage of work completed toward achievement of the planned end state.

Additional comments on the report's conclusions and recommendations are attached, as well as our planned corrective actions.

If you have any further questions, please call me at (202) 586-7709 or Mr. John Surash, Deputy Assistant Secretary, Office of Environmental Management, at (202) 586-3867.

Charles E. Anderson (Acting for)
Assistant Secretary for
Environmental Management

Attachment

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