



**U.S. Department of Energy**  
**Office of Inspector General**  
**Office of Audits and Inspections**

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# AUDIT REPORT

Follow-Up Audit on The Management of the  
Plutonium Finishing Plant Project

OAS-M-14-11

September 2014

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**Department of Energy**  
Washington, DC 20585

September 18, 2014

MEMORANDUM FOR THE MANAGER, RICHLAND OPERATIONS OFFICE

A handwritten signature in black ink, appearing to read "David Sedillo".

FROM: David Sedillo, Director  
Western Audits Division  
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Follow-Up on The Management of the Plutonium Finishing Plant Project"

BACKGROUND

The Department of Energy's (Department) Plutonium Finishing Plant (PFP), located at the Hanford Site in Washington State, became a highly contaminated nuclear facility while processing plutonium for the nation's nuclear arsenal for approximately 40 years. In 2008, the Department awarded CH2M HILL Plateau Remediation Company (CHPRC) a contract to decontaminate and demolish PFP. Completion of work on PFP is the Richland Operations Office's (Richland) top priority. The PFP work scope requires a well-trained workforce to decontaminate radioactive and chemical residues from gloveboxes, tanks and process piping prior to their removal in preparation for future demolition of the facility. Entries to contaminated spaces are performed in accordance with "work packages" that identify the scope and hazards associated with the work and define the methods and equipment to be used.

CHPRC's initial baseline estimate to remediate PFP was \$581 million, with an expected completion date of September 2013. Due to unforeseen situations with changes in the facility condition, workforce restructuring, permitting issues and other challenges, the performance baseline estimates were revised to \$753 million, with a completion date of September 2014. These costs included approximately \$311 million in accelerated funding from the *American Recovery and Reinvestment Act of 2009* (Recovery Act) to assist in the completion of tasks such as decontamination and removal of PFP's gloveboxes and demolition activities. Despite the influx of the Recovery Act funds, our audit on *Management of the Plutonium Finishing Plant Closure Project* (OAS-RA-L-11-01, November 2010), found that the project was at risk of not meeting the contractor's projected completion date. We initiated this audit to determine whether the Department had recovered schedule slippages and had effectively managed the PFP project.

RESULTS OF AUDIT

The Department encountered problems with CHPRC's ability to plan, manage and execute work; factors which contributed to both cost and schedule increases. Notably as of March 2014, the PFP project was expected to be completed in September 2016, at a cost of \$932 million; 2 years behind and \$179 million over CHPRC's revised performance baseline. Performance problems included:

- Unavailable or deficient work packages: Richland officials noted during 2012, at least 40 instances where work shifts for glovebox removal on the Remote Mechanical Lines A and C, a critical path task, were not worked due to either unavailable or deficient work packages. Project officials commented that workers are encouraged to "stop work" when uncertain on how to proceed, and that in some cases work instructions were indeed incorrect but in others, worker preferences on how work packages should be written stopped work.
- Insufficient labor resources to perform work: During the same period in 2012, Department project officials reported 47 instances where work shifts involving 9 to 12 employees per team for the Remote Mechanical Lines A and C were not worked.
- Employees not always productively employed: The Defense Contract Audit Agency informed the Department in an October 2012 memorandum that several work teams at PFP appeared to not be performing any sort of work activity. Instead, employees were observed engaging in non-work activities such as reading books, playing chess and visiting on cell-phones for several hours.
- Crane malfunctions in the Plutonium Reclamation Facility at PFP: The 65-year old crane is a "single point failure" for the preferred method for the removal of 196 tanks used to recycle scrap plutonium. The crane was out of service due to malfunctions approximately half of the time since February 2010, when CHPRC completed preparations for the crane necessary to support tank removal activities.
- Productivity issues: Value Engineering studies performed by CHPRC and the Department noted the project experienced downtime, primarily due to work productivity issues such as unavailable work packages. For instance, in a 2013 study project officials stated that 80 percent of planned work was not performed when scheduled in 2012. This does not imply that the workforce was idle, but rather, there were delayed starts, rescheduled work, and other events that impacted the Field Execution Schedule. Management acknowledged that this was a major concern.

Due to the difficult nature of work at the facility both Department and contractor officials have been well aware of the challenges in performing needed work at the PFP since early in the CHPRC contract. The facility is 65 years old and significantly contaminated. Recognizing these challenges, management has performed assessments and corrective actions to support continued work. In fact, in October 2013, the Office of Environmental Management completed a Project Peer Review of the PFP project, examining factors that may impede the schedule or increase the cost of the project. In particular, this Review addressed the problem of workforce productivity and availability concluding that "At this point, productivity cannot be determined." The Project Peer Review noted that workforce availability had increased recently, but tempered this with "The sustainability of this rate will be more definitive with time."

### **Contractor Remedial Actions**

Project officials provided several explanations for the cited issues, problems which contributed to the increased cost and a delay in schedule at PFP. In particular, officials stated that during the

timeframe noted in this report the project was experiencing rapid staffing changes. In part, these changes were prompted by the end of the Recovery Act and the related impacts that the Hanford Collective Bargaining Agreements had on site-wide workforce restructuring. Along with changes to PFP's beryllium work permit, these impacts affected the availability of resources and increased training. Consequently, fewer work packages could be authorized in the field, adversely impacting the project.

Secondly, crane malfunctions adversely impacted schedules. In response, CHPRC stated that it had maintained malfunctions as a risk in its Risk Management Plan since Fiscal Year 2009 and had initiated risk mitigation planning thereafter. Specifically, the crane was evaluated for both replacement and alternative options but the options were deemed unfeasible due to facility configuration, contamination concerns and reliability issues. Also, officials stated that based on independent recommendations and internal discussions in Fiscal Year 2013, it replaced most electrical and mechanical components of the crane, including the crane motor. Officials also stated that subsequent to implementation of these corrective actions, which occurred in late 2013, the crane had performed reliably.

Finally, officials explained that in the case of deficient work packages, consistent with Hanford Site policy, employees are encouraged to "stop work" in the event of differing actual conditions (e.g., radiological readings), uncertainty on how to proceed on a step, operational or system/infrastructure upset conditions, etc. Furthermore, CHPRC stated that in cases of work stoppages, workers have to wait until issues were resolved or until new work is properly set up. An internal investigation conducted by CHPRC found that this was the case for instances where employees were not actively engaged in productive work. CHPRC also stated that given the unanticipated stoppages, it may be difficult to find productive work for staff.

We understand that work stoppages on the project related to safety concerns and conduct of operations impact the workers' ability to execute work inside the facilities. However, when these situations arise workers should still be engaged in value-added work such as required reading, training, revisions to work documents, or contingent work scope. The contractor came to realize this and instructed managers and field work supervisors to develop alternate work that could be given to employees who could not continue regularly scheduled shifts. In fact, the contractor communicated to its employees that when situations occur that result in "idle" time, they should contact their supervisor to ensure that they are fully employed during the day.

## **Federal Contract Administration**

While we recognize that CHPRC acted to address a number of productivity problems, we identified areas of needed improvement in Richland's administration of the CHPRC contract. For example, Richland officials stated the contractor was not fully meeting the expectations of a particular contract requirement regarding project reporting; however, it had not formally notified the contractor of such. Improvements in Richland's administration of the CHPRC contract are needed to ensure that productivity issues are identified and addressed in a timely manner in the future. In particular, we found weaknesses in the following areas:

- **Contract Requirements:** Richland did not fully enforce contract requirements. Specifically, contract clause C.3.1.3.1, *Project Performance Reporting*, states "...that the contractor identify critical risks, actions planned, and actions taken to address those risks,

potential problems, impacts and alternative courses of action, including quality issues, staffing issues, assessment of the effectiveness of actions taken previously for significant issues, or the monitoring results of recovery plan implementation." When we discussed this with Federal officials, they stated the contractor was not meeting the full expectations of this requirement. Richland acknowledged that it had not formally notified the contractor of this. Richland stated that fully meeting this requirement would provide the necessary project performance information to support budget planning, execution, audit and evaluation, and other Department performance assessment and information needs.

- Tracking and Trending: Richland did not adequately track, trend and resolve these issues using a formal, quality assured, centralized corrective action system that would have included steps to perform causal analysis. Instead, officials developed a spreadsheet to informally track individual occurrences of lost work shifts and to identify trends. Information gathered in this manner did not lead to causal analysis and specific corrective action recommendations.
- Corrective Action: Although Richland informed the contractor that it was required to review and improve its processes through Conditional Payment of Fee actions, it did not consistently require the contractor to develop a formal corrective action plan after discovering productivity issues. Richland's "Oversight of Contractors" procedure state that regardless of the method of oversight, if a concern or significant finding is identified, the contractor is to be formally notified of the issue and be required to develop a Corrective Action Plan. The Plan must be approved by the Department and corrective actions verified.
- Audits and Assessments: Richland officials did not perform necessary audits and assessments as required by Department Order 414.1D, *Quality Assurance*. The Order requires the performance of audits and assessments to evaluate program and project processes, identify and correct problems, measure adequacy of work performance and promote improvement. Richland's procedures also required the performance of assessments, surveillances and special reviews to determine contractor performance in areas of health and safety, cost, schedule, work performance and quality assurance. Furthermore, the procedure included requirements for assessing potential performance issues and verifying appropriate contractor actions in response to previous concerns or findings. Despite these requirements, Richland's PFP project group had not performed formal assessments or surveillances of the project related to the productivity issues we identified since CHPRC assumed responsibility for PFP in 2008. Instead, officials relied on external reviews performed by organizations such as the Office of Environmental Management, and on informal reviews, called "Operational Awareness" reviews, for oversight of contractor activities. We noted, however, that Richland's own procedures indicate that "Operational Awareness" reviews are an informal method of oversight not intended to address potential performance issues. Furthermore, Richland's quality assurance function performed little in the way of audits and assessments of CHPRC's *Quality Assurance Program* implementation plan at PFP. In fact, the Office of Environmental Management noted in 2012, that Richland's quality assurance function had not performed any audits even though such activities were required by the Department and its *Quality Assurance Implementation Plan*.

Richland management recognized that it needs to take additional steps to improve the manner in which this important work is carried out and stated that they had taken key steps to improve safety and productivity. However, we concluded that more needs to be done to improve Richland's administration of the CHPRC contract.

### RECOMMENDATIONS

We recommend that the Manager, Richland Operations Office ensure:

1. The enforcement of contract requirements for identifying critical risks, actions planned, and actions taken to address those risks; potential problems, impacts, and alternative courses of action, including quality issues; staffing issues, assessment of the effectiveness of actions taken previously for significant issues; and the monitoring results of recovery plan implementation;
2. Performance problems are adequately tracked and trended;
3. CHPRC develops corrective actions plans to address productivity problems; and
4. Formal quality assurance audits and assessments are performed as required.

### MANAGEMENT REACTION

Management agreed with our recommendations and proposed corrective actions. Management's formal comments are included in Attachment 3.

### AUDITOR COMMENTS

Management's proposed corrective actions are responsive to the report's recommendations.

Attachment

cc: Deputy Secretary  
Acting Assistant Secretary for Environmental Management  
Chief of Staff

## OBJECTIVE, SCOPE AND METHODOLOGY

### OBJECTIVE

The objective of this audit was to determine if the Department of Energy (Department) recovered schedule slippages and had effectively managed the Plutonium Finishing Plant (PFP) project.

### SCOPE

The audit was performed from September 2012 to September 2014, at the Richland Operations Office (Richland), PFP, and the CH2M Hill Plateau Remediation Company (CHPRC) in Richland, Washington. The audit was conducted under Office of Inspector General Project Number A12RL060.

### METHODOLOGY

To accomplish the audit objective, we:

- Reviewed Federal and Department regulations and guidance on the application of quality assurance to Department programs and projects;
- Reviewed changes to project schedule and cost;
- Evaluated the results of prior audits and reviews;
- Reviewed information concerning lost work shifts associated with key portions of the PFP project;
- Determined the amount of time lost due to malfunctions with the Plutonium Reclamation Facility canyon crane;
- Reviewed information from Richland Integrated Evaluation Plan; and
- Met with Headquarters, Richland, and CHPRC officials to discuss the implementation of quality assurance principles to the PFP project.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. Accordingly, we assessed significant internal controls and compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed the Department's implementation of the *GPR Modernization Act of 2010* as it relates to our audit objective and found that the Department had established performance measures applicable to the PFP project.

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 achieve the objective of our audit. Management waived the exit conference.

**PRIOR REPORT**

- Audit Report on [\*Management of the Plutonium Finishing Plant Closure Project\*](#) (OAS-RA-L-11-01, November 2010). The audit noted that the project had met its American Recovery and Reinvestment Act goal to hire an additional 300 employees for the project. However, it also noted that absent improvements within the next 12 months, the project may not be completed by September 30, 2013, as planned. Specifically the project was significantly behind schedule in decontaminating gloveboxes, a key activity on the critical path to completing the project on time.

## MANAGEMENT COMMENTS

United States Government

Department of Energy

**memorandum**

Richland Operations Office

DATE: AUG 28 2014  
 REPLY TO: AMRP:GRK/14-AMRP-0272  
 ATTN OF:

SUBJECT: MANAGEMENT RESPONSE TO THE OFFICE OF INSPECTOR GENERAL (OIG)  
 DRAFT AUDIT REPORT ON "FOLLOW-UP ON THE MANAGEMENT OF THE  
 PLUTONIUM FINISHING PLANT PROJECT"

TO: D. Sedillo, Director  
 Office of Inspector General  
 Western Audits Division, IG-323

The U.S. Department of Energy (DOE) Richland Operations Office (RL) appreciates the opportunity to review and comment on the subject draft audit report prepared by DOE's Office of Inspector General (OIG). We have reviewed the information in the draft report with respect to the facts presented, conclusions reached, and appropriateness of the recommendations. A discussion of the report's recommendations follows.

**Recommendation 1**

Ensure the enforcement of contract requirements for identifying critical risks, actions planned, and actions taken to address those risks, potential problems, impacts, and alternative courses of action, including quality issues, staffing issues, assessment of the effectiveness of actions taken previously for significant issues, or the monitoring results of recovery plan implementation.

**Management Response:** RL concurs. We acknowledge there is room for improvement in exercising our contract administration authority to the level and degree necessary to assure adequacy of work performance. We have recently instituted formal monthly project reviews at the senior RL and contractor management levels. These monthly meetings include discussions on critical risks, potential problems, corrective actions (and assessment of the effectiveness of those actions), and on the use of newly developed project performance metrics to more closely track work progress. Our next step is to conduct a formal, multi-discipline assessment of the contractor's corrective action management system against the contract requirements, to include their earned value management system (EVMS) and associated cost and schedule performance issues/reporting responsibilities. This action is planned to be complete by January 30, 2015.

**Recommendation 2**

Ensure performance problems are adequately tracked and trended.

**Management Response:** RL concurs. As the OIG identified, RL predominantly

D. Sedillo  
14-AMRP-0272

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documents its project and contract oversight results in an Operational Awareness (OA) database and in informal spreadsheets rather than in formal reports to the contractor. By limiting our documentation to these methods, tracking and trending of apparent issues in either the contractor's or RL's issue management systems are limited or ad-hoc. By implementing the corrective actions in response to the OIG's recommendations one and four, deficiencies and problems will be captured in a formal issue management system with the capability for tracking and trending. A number of recent internal and external reviews performed at RL determined a need to revise the RL issue management system, including improvement in the ability to track and trend identified issues, and inclusion of review results not driven by formal assessments (e.g., OA entries) to help with monitoring contractor performance. The revised RL issue management system is currently under development, and is planned to be implemented by April 30, 2015.

### **Recommendation 3**

Ensure CHPRC develops corrective actions plans to address productivity problems.

**Management Response:** RL concurs. We share your concerns and observations regarding the productivity problems described in the report. Presently, our contractor conducts and documents cost and schedule variance analyses monthly and, if thresholds are exceeded, corrective actions are developed and tracked in a corrective action log until they are resolved. Use of variance reports and this log as part of productivity issue management is reasonable and consistent with EVMS requirements. But, considering past project performance and the fact the Plutonium Finishing Plant project is planned to be completed in the next three years, RL feels that in addition to the actions described in the above management responses, a formal letter to our contractor is justified addressing this topic. Therefore, RL will formally communicate the need for a more rigorous and formal project productivity issue management process, including the use of corrective action plans or recovery plans to address productivity problems. RL plans to complete this action by November 26, 2014. The effectiveness of the above action will be evaluated in follow-up surveillances or audits.

### **Recommendation 4**

Ensure formal quality assurance audits and assessments are performed as required.

**Management Response:** RL concurs. We will schedule both project and quality assurance formal assessments in the RL office-wide integrated evaluation plan beginning with Fiscal Year 2015. We will complete this action by October 30, 2014. The formal assessments will be conducted annually and quarterly depending on the topical area under review in order to provide both RL and contractor management with regular and formal feedback on contract/project performance. In addition, we will provide assessment training to project personnel by December 15, 2014, to ensure assessments will be conducted consistent with current expectations and policies.

## **FEEDBACK**

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