

memorandum

DATE: February 4, 2010 Audit Report No. OAS-L-10-03

REPLY TO:

ATTN OF: IG-32 (A09ID018)

SUBJECT: Report on "Processing of Sodium-Bearing Waste at the Idaho National Laboratory"

TO: Deputy Assistant Secretary for Technical and Regulatory Support, Office of Environmental Management, EM-40

INTRODUCTION AND OBJECTIVE

The Department of Energy (Department), under a 1992 Notice of Noncompliance Consent Order, is required to cease use of the radioactive liquid waste tank farm at the Idaho Nuclear Technology and Engineering Center (INTEC) by December 31, 2012. Approximately 900,000 gallons of liquid waste remain in the INTEC tank farm. Besides being radioactive, this mixed waste has a high sodium content from decontamination activities and as such is also regulated by the State of Idaho under the Resource Conservation and Recovery Act. Accordingly, this waste is commonly referred to as "sodium-bearing waste." A 1995 Settlement Agreement with the State of Idaho requires the Department to treat this waste by the end of 2012 which would also enable the Department to close the tank farm in support of the 1992 Consent Order.

In 2005, the Department contracted with CH2M WG Idaho, LLC (CWI) for the Idaho Cleanup Project to provide the facilities and expertise to treat the liquid sodium-bearing waste for eventual disposal at the Waste Isolation Pilot Plant (WIPP). CWI proposed constructing the Sodium-Bearing Waste Treatment Facility (SBWTF) to treat the sodium-bearing waste in a form suitable for disposal. CWI also proposed that this facility could subsequently be used to treat other waste types under its purview at the Idaho National Laboratory (INL), thereby reducing costs associated with having multiple treatment facilities. In addition to these waste forms, the Department decided that the facility would also have the capability to package and ship 4,400 cubic meters of radioactive calcine waste for disposal at a high-level waste repository. The SBWTF would also have an adjacent area with shielded vaults capable of temporarily storing the treated waste. Management of the project was to meet the requirements of the Department's Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, to help ensure that it was delivered within budget, on schedule, and fully capable of meeting mission performance expectations.

We conducted this audit to assess whether the Department had effectively managed construction of the SBWTF.

CONCLUSIONS AND OBSERVATIONS

The Department had not always effectively managed construction of the SBWTF. Specifically, the Department did not ensure that the project was managed under a sufficiently developed performance baseline. As a result, costs were greater than anticipated and the schedule for completing work may not have sufficient schedule contingency to deal with unforeseen occurrences and delays.

Performance Baseline

In December 2006, the Department approved a cost baseline for the project of \$461 million and a schedule baseline that called for construction of the SBWTF to be completed and operations to begin in July 2010. The approved schedule provided the Department with over two years of operations to complete treatment of the sodium-bearing waste to meet the December 2012 requirement of the Idaho Settlement Agreement.

After the design effort was underway and prior to approving the performance baseline, the Department decided, in February 2006, to expand the mission of the SBWTF to include the potential for treatment of high-level radioactive calcine waste. The performance baseline approved by the Department, however, did not include all the cost and schedule necessary to provide the expanded mission capability. In particular, the decision to expand the mission of the facility to include the potential for high-level radioactive waste necessitated additional design, construction and testing costs to meet more stringent seismic and footprint requirements for the facility. Although DOE Order 413.3A requires that the performance baseline be based upon a well-defined facility design, an independent review performed in 2008 found that the performance baseline was approved before sufficient design development had occurred to support the baseline estimate.

Management asserted that it was aware in 2006, when it approved the baseline, that changes would be needed to address the expanded project scope. However, management stated that it decided to approve the baseline due, in part, to its need to facilitate near term project execution. We noted, however, that the Department did not change the performance baseline for the project until January 2009, two years after it first approved the baseline. At that time the Department approved a revised baseline that recognized an increase in total project costs of approximately \$109 million. According to Department officials, approximately \$65 million of the cost increase was attributable to upgrades associated with the expanded mission of the facility that had not been previously quantified. Department officials attributed other cost increases to a directed delay in construction that resulted from fiscal year 2009 funding constraints.

Change Control

To help control the escalating project costs, management made several technical changes to the project's scope in revising the baseline. While management asserted that these changes were insignificant, they did not provide documentation demonstrating that the

cost impact of these technical changes had been fully assessed. Specifically, management officials told us that the technical changes eliminated SBWTF capabilities that were considered redundant or no longer needed. For example, management considered a third packaging line unnecessary after it eliminated the shipment of sodium-bearing waste to WIPP from the project's scope. The revised baseline, however, also added more than 200 storage spaces in an existing facility to accommodate the treated sodium-bearing waste since it would not be shipped for disposal at the time of treatment. During our review, the Department had not included the cost of these scope changes in its summary level change control documents.

The revised baseline also recognized a delay in construction completion and the start of facility operations of approximately one year, until August 2011. As a result, the Department will have just over one year to complete treatment of the sodium-bearing waste if it is to meet the requirements of the Idaho Settlement Agreement. According to Department officials, to meet this deadline the Department plans to operate the facility 24-hours a day, 7-days a week. This aggressive operating schedule could process the sodium-bearing waste within 15 months, just in time to meet the December 2012 deadline for completing treatment of the waste established by the Idaho Settlement Agreement. We concluded the very tight operations schedule presents a major risk since it may not provide sufficient time to address unforeseen occurrences and delays.

Actions Taken by Management

The Office of Environmental Management acknowledged that contractor performance and Department-directed changes have contributed to increased costs and schedule on the project, which has constrained the schedule for meeting the December 2012 Idaho Settlement Agreement milestone. Management also recognized that there were baseline management problems with this project and has taken steps to address them.

Senior management pointed out that it has made a high priority of improving performance on construction projects by: increasing the frequency of senior level management review from quarterly to monthly; enhancing information and analysis to make sure sufficient attention was given to project progress and corrective actions; and initiating comprehensive Construction Progress Reviews.

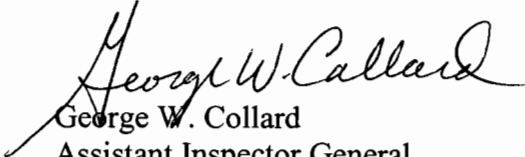
Additionally, in 2008 Environmental Management replaced the Federal Project Director; added technical construction oversight, startup and project controls staff; and institutionalized a formal oversight approach. Environmental Management arranged with the Department's Office of Engineering and Construction Management to validate improvements in management of the project, and to review the project at critical points in its progression. Also, the contractor replaced its Project Director, Project Manager, Project Controls Manager, and Engineering Manager. Further, the contractor has taken steps to improve schedule management and reassigned engineering work from a subcontractor to its in-house staff.

SUGGESTED ACTIONS

In recognition of management's action to improve management of the SBWTF project, we are not making formal recommendations. However, given the increases in estimated

costs, the lack of information about the impact on costs of capabilities de-scoped from the project, and the very tight schedule remaining to complete work, we suggest that Office of Environmental Management senior officials continue to focus attention on the status of the SBWTF project.

Since no formal recommendations are being made in this report, a formal response is not required. We appreciate the cooperation of your staff and the various Departmental elements that provided information and assistance.


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

Attachment

cc: Team Leader, Office of Risk Management, CF-1.2
Dianne Williams, Office of Risk Management, CF-1.2
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SCOPE AND METHODOLOGY

The audit was performed from January 2009 to January 2010 at the Idaho Operations Office. The scope of the audit focused on the planning and construction of the Sodium-Bearing Waste Treatment Facility (formerly known as the Integrated Waste Treatment Unit) at the Idaho National Laboratory.

To accomplish the audit objective, we obtained and reviewed relevant project planning documents, contract proposal and subsequent contract modifications, Congressional budgets, management reports, independent review reports, and correspondence between the Department of Energy and its contractor; held discussions with key officials at the Idaho Operations Office; and toured the construction site. In addition, we reviewed the requirements in DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, along with its accompanying Guide.

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 that the evidence obtained provides a reasonable basis for our findings and conclusions based on our 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. Also, we examined the establishment of performance measures in accordance with the *Government Performance and Results Act of 1993* as it relates to the audit objective. Finally, since we did not rely upon automated data processing information to accomplish our audit objective, we did not conduct an assessment of the reliability of computer processed data.

Officials from the Idaho Operations Office waived the exit conference.