



OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

SPECIAL REPORT

OIG-SR-17-04

February 2017

**MANAGEMENT OF SUSPENDED
PROCUREMENTS AT THE WASTE
TREATMENT AND IMMOBILIZATION
PLANT PROJECT**



Department of Energy
Washington, DC 20585

February 23, 2017

MEMORANDUM FOR THE SECRETARY

A handwritten signature in black ink that reads "April G. Stephenson".

FROM: April G. Stephenson
Acting Inspector General

SUBJECT: INFORMATION: Special Report on “Management of Suspended Procurements at the Waste Treatment and Immobilization Plant Project”

BACKGROUND

One of the Department of Energy’s largest cleanup challenges involves 56 million gallons of hazardous and highly radioactive waste stored in underground tanks at the Hanford Site. The Department’s Office of River Protection manages the cleanup project. As part of this effort, the Department contracted with Bechtel National, Inc., (Bechtel) to complete the design and construction of the Waste Treatment and Immobilization Plant (WTP) to treat and immobilize the majority of the waste in preparation for permanent disposal. WTP includes four main facilities: Pretreatment, High-Level Waste Vitrification, Low-Activity Waste Vitrification, and the Analytical Laboratory.

In November 2011, the Department notified Bechtel that significant reductions in project funding would occur. As a result, Bechtel began to suspend procurements for parts and materials for the Pretreatment Facility. Although Bechtel suspended activity on a total of 56 procurements, it continued to incur costs for the storage of records, materials, and uncompleted parts and equipment. In late 2014, after the Department decided that certain items would not be used in planned testing or in the actual plant, Bechtel performed an analysis of the 56 procurements to determine ways to reduce costs. Bechtel determined it cost nearly \$5.3 million a year to maintain the procurements in suspension. Based on its analysis and because of the significant cost, Bechtel recommended terminating 28 procurements, completing 6, and retaining 22 in suspension. In response to Bechtel’s analysis, on April 28, 2015, the Office of Inspector General received a congressional request to review “questionable contract practices” related to these procurements. In response, we conducted this audit to determine whether the suspended procurements for WTP’s Pretreatment Facility were resolved.

RESULTS OF AUDIT

The Department and Bechtel had not fully resolved issues with suspended procurements for WTP’s Pretreatment Facility. Specifically, neither the Department nor Bechtel has fully acted to

terminate all of the 28 procurements recommended for termination. Although Bechtel initially suspended the procurements due to funding constraints, subsequent events resulted in major changes to the project, circumstances that increased the expected duration of the suspensions as well as affected the need for certain items.

According to Bechtel officials, substantial actions were taken to manage the suspended procurements, including reviewing and negotiating suspension costs on a regular basis, ensuring inventory control and appropriate storage conditions, performing surveillances as necessary, and meeting all requirements that are applicable to the management of those procurements. However, had the Department and Bechtel taken the actions recommended in Bechtel's analysis to terminate certain suspended procurements, they could have avoided portions of the costs incurred during the suspension period. For example, had the Department and Bechtel acted on the January 2015 recommendations to terminate the five most costly procurements, our analysis revealed that they could have avoided \$1.9 million in suspension costs incurred since that date.

Timeline of Events Affecting Suspensions

Our review of a timeline of events associated with the WTP project between September 2011 and October 2014 showed that the design and construction of the Pretreatment Facility, as well as resolution of associated technical issues, significantly affected the need for the procurements. In 2011 Bechtel began suspending the 56 Pretreatment Facility procurements due to pending funding reductions for the WTP project. Initially, Bechtel and the Department expected that the suspensions would last 1 to 2 years. However, subsequent events starting in 2012 concerning technical uncertainties resulted in a halt to construction activities for the Pretreatment Facility. These subsequent events also indicated that engineering and design changes would significantly affect some of the equipment being procured. During our review, we noted the following key events, which provided a timeline of changes that had an impact on the suspended procurements:

- September 2011 – Bechtel requested direction from the Department on what actions to take to address potential funding reductions for the project. Bechtel proposed deferring procurements for parts and materials and other actions as potential steps it could take to reduce funding requirements.
- November 2011 – The Department responded to Bechtel stating that the contractor “should take all actions it deems necessary to mitigate negative impacts to the project and/or contract performance (i.e., schedule, price, and scope).”
- February 2012 – The Department directed Bechtel to rebaseline the Pretreatment and High-Level Waste Vitrification Facilities and replan the Low-Activity Waste Vitrification Facility, Balance of Facilities, and the Analytical Laboratory. This letter clearly identified several major priorities to occur before construction of the Pretreatment Facility.
- August 2012 – The Department instructed Bechtel to halt engineering and construction work on the Pretreatment and High-Level Waste Vitrification Facilities until Bechtel

could determine that associated technical risk was substantially reduced. The direction also listed three areas of technical concern with the Pretreatment Facility that were to be addressed: pulse jet mixing, vessel design verification, and erosion/corrosion issues. Additionally, the Secretary of Energy established a team of experts to review WTP technical issues and tank waste treatment strategies.

- November 2012 – The Department directed Bechtel to suspend efforts to use computational fluid dynamics as a design verification tool to predict the performance of pulse jet mixers in the Newtonian and non-Newtonian process vessels. At the same time, the Secretary informed the Defense Nuclear Facilities Safety Board that the Department envisioned that a full-scale test program will replace the current design verification strategy.
- May 2013 – The Department formally modified Bechtel’s contract to replace computational fluid dynamics with full-scale vessel testing as a design verification tool.
- June 2013 – Bechtel determined that at least six different vessels would require full-scale testing to support design verification.
- October 2013 – Department officials determined that testing of the six vessels could cost at least \$900 million and take up to 8 years.
- March 2014 – The Department developed a revised approach to vessel testing to address the full-scale testing cost and schedule growth. This approach called for adoption of a standardized vessel design to replace the five vessel design concepts currently identified for the Pretreatment Facility. The Department estimated that full-scale testing using such an approach could be accomplished in 3 years at a cost between \$147 and \$180 million.
- October 2014 – The Department formally incorporated the full-scale testing program using a standardized vessel design into Bechtel’s contract. Department officials stated that they would defer incorporating the use of a standardized vessel within the Pretreatment Facility into Bechtel’s contract until after testing results were available, which was expected to be in 2017.

Bechtel’s Analysis and Subsequent Events

In January 2015 Bechtel completed its analysis that ultimately recommended terminating 28 procurements, including 5 of the most costly procurements. The Department reviewed Bechtel’s analysis, including performing its own analysis, and responded to the contractor that the recommendations “appear reasonable.” However, between January 2015 and January 2016, Bechtel had only taken action to terminate 12 of the 28 purchase orders including the 4 for which the vendor was no longer in business. According to Bechtel officials in February 2016, they planned to take action to terminate nine additional purchase orders by the end of April 2016, including those for which the vendor is no longer able to perform the work. As of September 8, 2016, Bechtel officials stated that they had completed actions on seven of the nine purchase orders.

Although Bechtel acted to terminate a number of the purchase orders, as of January 4, 2017 Bechtel had still not acted on its own recommendations to terminate the five most costly procurements. In the year after Bechtel recommended termination, the Department incurred approximately \$1.9 million in suspension costs for those five procurements. Those procurements account for more than \$128 million of the \$181 million (71 percent) spent on all 56 suspended procurements as of January 2015, the date of Bechtel's analysis. Three of these procurements were for obsolete pressure vessels that had been in suspension since 2012. One procurement was for an evaporator system, and another was for recirculation evaporators that had been in suspension since December 2011.

Impasse Between the Department and Bechtel

The delays in resolving issues with the suspended procurements resulted primarily from an impasse between the Department and Bechtel over roles and responsibilities, an issue that delayed action being taken on Bechtel's recommendations for terminating the five most costly suspended procurements. In a January 9, 2015, memorandum to the Department communicating the results of its analysis of the suspended procurements, Bechtel indicated that it expected the Department to determine the next actions to be taken. The memo stated that Bechtel anticipated the need for the analysis "in order to provide the necessary insight to support an immediate decision by [the Department]." In subsequent discussions and correspondence with the Department, Bechtel repeatedly requested the Department's concurrence on its recommendations. However, the Department did not formally respond to Bechtel's analysis until August 2015.

In responding, the Department did not state whether it concurred with the recommendations. Rather, the Department only stated that the recommendations "appeared reasonable" in the instances where its own analysis agreed with Bechtel's analysis. According to contracting officials at both the Office of River Protection and the Office of Environmental Management, Bechtel had authority under its contract to act on the recommendations of its analysis without direction or approval from the Department. Furthermore, Department officials stated that they had not provided Bechtel direction because of contractual liability that could potentially arise from the Department directing actions on subcontracts held between Bechtel and its various vendors. Additionally, Department officials stated that they had provided Bechtel the responses necessary for Bechtel to manage each of the subcontracts in question.

Bechtel officials agreed they had authority to act on the recommendations; however, they indicated they wanted the Department's direction to proceed in order to avoid any questions regarding actions taken on the procurements in the future. After we expressed our concerns about no action being taken on these procurements to the Department, it issued a memo in December 2015 stating that Bechtel had the responsibility "to evaluate, award, and manage subcontracts in order to effectively manage project cost and ensure the efficient use of public resources." Since January 2016, efforts have been made to resolve the impasse, including making two modifications to the Department's contract with Bechtel. However, as of January 4, 2017, the five most costly procurements had not been terminated.

Impact of Delay

Delays in carrying out the recommendations to terminate procurements that are no longer needed resulted in the Department incurring costs that could have been avoided. Had the Department and Bechtel acted on the January 2015 recommendations to terminate the five most costly process vessel and evaporator system procurements, they could have avoided \$1.9 million in suspension costs incurred in the 12 months since that date. In its comments to the report, the Department stated that it had validated the potential cost avoidance. Had these procurements been terminated, these funds could have been used to accomplish other tasks on the WTP project.

Award Fee

The congressional request also asked the Office of Inspector General to determine whether Bechtel had earned fees for managing these procurements and whether those fees were appropriate. Our review of Bechtel's performance plans for the period of 2011 through 2015 found that during the period from 2011 through the first half of 2013, a portion of Bechtel's award fee was based on how well the contractor managed its business systems, including its procurement system as a whole. We noted that during this period, the amount of award fee earned by Bechtel had declined; however, the award fee determination lacked the specificity necessary to ascertain whether the decrease was related to the issues associated with suspended procurements. From the second half of 2013 through 2015, Bechtel's performance plans did not include management of business systems as part of the basis for determining award fee.

RECOMMENDATIONS

Resolution of the WTP's technical design approaches, along with restarting engineering and construction, has the potential to significantly affect ongoing procurements for WTP's Pretreatment Facility. To make certain that the impact of these potential changes are fully considered, as well as to address the current recommendations for the suspended procurements, we recommend that the Acting Assistant Secretary for Environmental Management direct the Office of River Protection to:

1. Ensure that both ORP and Bechtel take a proactive approach in evaluating the future cost and schedule impact of changes to the WTP project on existing procurements;
2. Review the WTP contract to ensure requirements for management of procurements are clearly stated and complete WTP contract revisions as appropriate to provide any additional clarification in the management of procurements; and
3. Ensure that Bechtel takes action to manage the suspended procurements to ensure cost and schedule effectiveness, as appropriate.

MANAGEMENT RESPONSE

EM stated that the recommendations provided in the report aligned with ORP's ongoing initiatives for management of the procurement suspension of the Waste Treatment and Immobilization Plant. EM also provided corrective actions to address all three of the report's recommendations. Included in the corrective actions is quarterly reporting by Bechtel to the Department on the status of suspended procurements; a review of contract requirements; and annual assessments of procurements by the Department.

In its response, EM pointed out that WTP is a large, complex project that has been affected by a number of major factors. EM encouraged the OIG to consider and address in its conclusion some of these factors that impacted Bechtel's procurement management.

Management's comments are included in Attachment 3.

AUDITOR COMMENTS

We consider management's comments and planned corrective actions to be fully responsive to our findings and recommendations.

In its comments to the report, EM requested that we consider and include in our conclusion some of the factors impacting Bechtel's procurement management. These factors were considered in our analysis and are addressed in our report. Specifically the section of the report entitled "Timeline of Events Affecting Suspensions" notes many of the factors EM included in its response. These factors were included as part of our analysis and in preparing the report.

Attachments

cc: Deputy Secretary
Acting Under Secretary for Science and Energy
Acting Assistant Secretary for Environmental Management
Chief of Staff

OBJECTIVE, SCOPE, AND METHODOLOGY

OBJECTIVE

The objective of this audit was to determine whether the suspended procurements for the Waste Treatment and Immobilization Plant's Pretreatment Facility were resolved.

SCOPE

The audit was performed from October 2015 through February 2017. The scope of the audit was limited to the Department of Energy's Office of River Protection and Bechtel National Inc.'s (Bechtel) management of the 56 suspended procurements for the Waste Treatment and Immobilization Plant's Pretreatment Facility located on the Hanford Site near Richland, Washington. We conducted work at the Office of River Protection and at Bechtel, both of which are located in Richland, Washington. The audit was conducted under Office of Inspector General project number A16RL002.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed applicable laws, regulations, and program guidance applicable to procurement activities within the Department;
- Interviewed key Department and Bechtel officials to discuss the processes and procedures used to manage suspended procurements;
- Obtained and analyzed the review of suspended procurements performed by both Bechtel and the Office of River Protection;
- Reviewed the Bechtel contract terms, and award fee documentation;
- Obtained and reviewed cost information regarding procurement and suspension costs for the 56 suspended procurements; and
- Discussed with Department and Bechtel officials their positions in regard to carrying out the recommendations related to the suspended procurements.

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 objectives. We believe the evidence obtained provides a reasonable basis for our findings and 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 it was not applicable to our audit scope.

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 relied on computer-processed data to some extent to satisfy our objective related to suspended procurements. To verify the accuracy of that data we confirmed the validity and reliability by reviewing supporting documentation used to generate the computer-processed data. We held an exit conference with the Department on January 4, 2017.

PRIOR REPORTS

- Audit Report on [Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site](#) (DOE-OIG-16-03, November 2015). The review noted that the Department and its contractor, Bechtel National, Inc., (Bechtel) had not always effectively executed procurements and material management activities at the Office of River Protection. Specifically, Bechtel did not always identify nonconforming items resulting from vendor errors in a timely manner, resolve issues with nonconforming items in a timely manner after they were identified, and recover the costs for resolving nonconformances from vendors when the problems were the result of vendor errors. These problems were caused by weaknesses in Bechtel's quality assurance program. In particular, although Bechtel had procedures in place to prevent or identify nonconforming items, they were not always performed effectively. Additionally, Bechtel's procedures for resolving nonconforming parts and materials did not address timely resolution of these issues. Further, Bechtel's process to recover costs from suppliers had several weaknesses that limited the amount of funds the contractor could recover from vendors. Contributing to these weaknesses were Bechtel's failure to effectively implement corrective actions, a lack of timelines for resolving nonconformances, and inadequate Federal oversight over Bechtel's cost recovery processes for nonconforming items. In the absence of improved processes and procedures for identifying and resolving nonconformances in procured items and materials, the Department will continue to incur unnecessary costs for the construction of Waste Treatment and Immobilization Plant.
- Audit Report on [Department of Energy Quality Assurance: Design Control for the Waste Treatment and Immobilization Plant at the Hanford Site](#) (DOE/IG-0894, September 2013). The audit noted significant shortcomings in the Department's process for managing the design and fabrication changes of waste processing equipment procured for the Waste Treatment and Immobilization Plant. Specifically, the Department had not ensured that Bechtel had subjected design changes requested by suppliers to the required review and approval by Bechtel's Environmental and Nuclear Safety Group or had properly verified that deviations from design requirements that could affect nuclear safety were implemented. This occurred because the Department's oversight of Bechtel's quality assurance program lacked focus. The depth and breadth of the Department's oversight was not sufficient to identify weaknesses in the implementation or adequacy of Bechtel's procedures. Additionally, Bechtel had also not effectively implemented its own quality assurance procedures. The exclusion of Nuclear Safety from the design change process can be traced to poor implementation of existing procedures. Furthermore, Bechtel did not have quality control procedures or processes to ensure that deviations from design or specifications were documented to support product fabrication and delivery. As a result, these problems led to the creation of major design vulnerabilities. Proper design control is essential to ensure that critical equipment is properly fabricated to specifications and will perform its safety function. The lack of a robust design control process makes it difficult to ascertain whether all necessary safety-related design activities are adequate and that workers, members of the public, and the environment are adequately protected.

MANAGEMENT COMMENTS



Department of Energy
Washington, DC 20585

DEC 15 2016

MEMORANDUM FOR GEORGE W. COLLARD
DEPUTY INSPECTOR GENERAL
FOR AUDITS AND INSPECTIONS
OFFICE OF INSPECTOR GENERAL

FROM: MONICA C. REGALBUTO 
ASSISTANT SECRETARY
FOR ENVIRONMENTAL MANAGEMENT

SUBJECT: Management Response to the Office of Inspector General Draft Audit
Report on "Management of Suspended Procurements at the Waste
Treatment and Immobilization Plant Project" (IG-A16RL002)

The U.S. Department of Energy (DOE), Office of Environmental Management (EM) appreciates the opportunity to review the Office of Inspector General's (OIG) draft report: "*Management of Suspended Procurements at the Waste Treatment and Immobilization Plant Project.*" The recommendations provided in the draft report align with the Office of River Protection (ORP) ongoing initiatives for management of the procurement suspension of the Waste Treatment and Immobilization Plant (WTP) High Level Waste (HLW) and Pretreatment (PT) Facilities.

The WTP is a large, complex project that has been affected by control point issues, Continuing Resolutions, changes in the WTP baseline, and technical issues associated with the PT and HLW Facilities. With this in mind, the Office of Environmental Management respectfully requests that the OIG consider the broader context for the Bechtel National, Incorporated (BNI) procurement management actions. EM would encourage the OIG to review, evaluate, include in its analysis, and address in its conclusions some of the factors that impacted BNI's procurement management, such as technical issues associated with the PT Facility, and to a lesser degree the HLW Facility.

For example, in 2011, when the Federal Project Director (FPD) directed BNI to accelerate startup and commissioning preparations, the WTP Project was progressing at a rapid pace. However, amid funding constraints and concerns, DOE requested BNI develop a planning case to manage procurements in the event the final fiscal year 2012 budget appropriation was \$100 million less than the requested \$840 million. DOE's intent was to determine if project carryover would be sufficient to maintain the project procurement pace should the budget shortfall be realized.

In February 2012, DOE determined that unresolved technical issues necessitated development of a new baseline for the PT and HLW Facilities, and requested BNI prepare a baseline change proposal. In August 2012, DOE provided BNI additional guidance on work scope through fiscal year 2014, directing a slow-down of design and construction work associated with unresolved technical issues impacting the PT Facility, and to a lesser degree the HLW Facility.



At that time, both DOE and BNI were projecting that two years would be adequate to resolve technical issues to the extent needed to allow resumption of design and construction. DOE and BNI concluded that Large Scale Integrated Testing (LSIT) and Computational Fluid Dynamics (CFD) would be sufficient to determine if the design met nuclear safety requirements for safe operations. In addition, during this time period, the Defense Nuclear Facilities Safety Board, among others, raised new questions regarding BNI's nuclear safety assumptions, and DOE determined that LSIT and CFD would not be adequate alone to prove that the WTP would be safe to operate. Following this determination in August 2012, DOE halted design and construction on the PT Facility and greatly slowed design and construction on the HLW Facility. At the time, the expectation was that some, if not all, vessels in the PT Facility might require full scale vessel testing; however, a path forward had not yet been determined.

Subsequently, in June 2013, in consideration of the status of WTP, DOE developed a new framework that outlined a phased approach to the completion and startup of the WTP. This approach was endorsed by DOE in September 2013. As a result, in July 2014, DOE requested BNI develop a plan and funding profile that maintained its work within a \$690 million per year allocation, achieve the objectives of the phased approach, and identify other activities where costs could be reduced or delayed, including procurements affected by the suspension in PT work.

In the timeframe covered by the OIG report, DOE reiterates it has appropriately managed and consistently conveyed to BNI that it had the necessary contract authority and obligation to effectively manage subcontract project cost and scope, including the management and/or termination of 56 suspended procurements. However, from January 9, 2015, through January 8, 2016, BNI abstained from terminating all of the remaining 28 procurements as recommended by the BNI analysis, resulting in monthly storage cost of \$1.9 million for the most costly suspended procurements, five process vessels and an evaporator (see OIG A16RL002).

Terminating the purchase orders could have potentially avoided \$1.9 million of suspension and storage cost. The Department validated the potential cost avoidance by assessing monthly invoices during the time of the audit.

Recommendations:

- 1. "Ensure that both Office of River Protection and Bechtel take a proactive approach in evaluating the future cost and schedule impact of changes to the WTP project on existing procurements."**

The ORP will require the WTP contractor, BNI, to brief the WTP FPD and project staff on a quarterly basis on suspended and proposed suspended procurements. Reporting detail will consist of current subcontractor/vendor procurement cost and schedule data. The contractor shall also provide quarterly updates on any outstanding impacts and take appropriate action per contract requirements.

ORP will develop and perform annual assessments of the current subcontract/vendor procurements cost and schedule and validate that procurement policies and procedures are being adhered to per the current contract requirements. Such assessments will be performed utilizing a cross functional team consisting of project staff, contract specialists, and quality assurance specialists.

In addition, ORP will modify the WTP Design Change Procedure within six months to address the status of procurements impacted by design change. As part of the design change package, ORP will recommend the disposition of procured equipment as appropriate within the approval response.

Completion of this recommendation will be based on the performance of the first assessment. To ensure long term effectiveness, ORP will continue to perform annual assessments and verify closure of any Priority Level 1 or 2 findings identified during each assessment through the completion of the WTP Project.

An estimated completion date for the first briefing annual assessment report to the WTP FPD will be scheduled prior to the end of the fiscal year.

2. “Review the WTP contract to ensure requirements for management of procurements are clearly stated and complete WTP contract revisions as appropriate to provide any additional clarification in the management of procurements.”

ORP will review the WTP Contract to ensure requirements for management of procurements are clearly stated. In addition, ORP will complete contract revisions as appropriate to provide any additional clarification on the management of procurements. ORP will accomplish this as part of the annual subcontract/vendor procurement assessment (identified in corrective action 1, above).

Completion of this recommendation will be based on issuance of the first annual assessment report. If necessary, any resulting contract modifications will be completed within six months following the first annual assessment.

3. “Ensure that Bechtel takes timely action to manage the suspended procurements to ensure cost and schedule effectiveness, as appropriate.”

For suspended procurements, ORP will require BNI to submit corrective action plans for any identified subcontractor/vendor procurement cost and schedule impacts, and will ensure the contractor manages each procurement per the contract. As indicated in corrective action 1, the contractor will provide quarterly briefings, including cost and schedule data, for each suspended procurement to the WTP FPD and project staff. ORP will also conduct annual assessments to ensure the contractor is adhering to current policies, procedures, and contract requirements.

Completion of this recommendation will be based on assessment completion and the performance of the first assessment. However, to ensure long term effectiveness, ORP will continue to perform annual assessments and verify closure of any Priority Level 1 or 2 findings identified during each assessment through the completion of the WTP Project.

An estimated completion date for the first briefing annual assessment report to the WTP FPD will be scheduled prior to the end of the fiscal year.

FEEDBACK

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Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

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