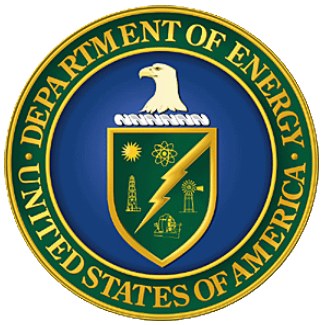

U.S. Department of Energy

Office of Inspector General

Office of Audits and Inspections

AUDIT REPORT

Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site

DOE-OIG-16-03

November 2015

Department of Energy
Washington, DC 20585

November 17, 2015

MEMORANDUM FOR THE SECRETARY

FROM: Rickey R. Hass
Acting Inspector General

SUBJECT: INFORMATION: Audit Report: "Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site"

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, located in Southeastern Washington State. The Department's Office of River Protection manages the cleanup project. As part of this effort, Bechtel National Inc. (Bechtel) was contracted by the Department 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. Construction of WTP began in 2001, with the start of operations scheduled to occur in 2019 and with an estimated cost of $12.2 billion. However, technical issues have led to construction delays for the project.

To support construction of WTP, Bechtel has procured approximately $4 billion in parts and materials through the end of fiscal year 2014 and instituted steps to ensure that procured parts and materials meet specifications and requirements. To help ensure that parts were satisfactory, Bechtel developed several controls to include verification of vendor design submissions, review of the manufacturing or fabrication process, and receipt inspection and testing. Bechtel also developed procedures to identify and resolve the nonconforming items and recover the costs from vendors. We initiated this audit to determine whether the procurements and material management activities process at WTP had been effectively executed.

RESULTS OF AUDIT

The Department and its contractor had not always effectively executed procurements and material management activities at the Office of River Protection. Specifically, Bechtel did not always do the following:

- Identify nonconforming items resulting from vendor errors in a timely manner. In 44 percent of the 1,365 nonconformances reviewed, Bechtel did not identify the issue until at least 2 years after the items arrived on site. In 25 cases, discovery of nonconformances

were not made until 9 or more years after delivery. For example, in September 2013, Bechtel employees identified a black cell pipe spool with a bend that was 90 degrees off from specifications. The pipe spool had been delivered to the Site in July 2004.

- Resolve issues with nonconforming items in a timely manner after they were identified. In 22 percent of the cases we reviewed, the issue was not resolved until a year or more after the nonconformance was identified. For example, Bechtel identified one nonconformance in June 2012, but it sat for more than 2 years waiting to be resolved. Meanwhile, the vendor that provided the material ceased operations in April 2013.

- Recover the costs for resolving nonconformances from vendors when the problems were the result of vendor errors. In many cases Bechtel either canceled efforts to recover the costs or recovered only a portion of the costs incurred to resolve the nonconformance, often due to the length of time that had transpired. For example, Bechtel recovered only $29,100 of $138,822 in direct costs incurred for rework performed on High-Level Waste duct support welds.

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 for nonconforming parts and materials. 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.

While Bechtel issued a Managed Improvement Plan to address a number of priority level 1 findings issued by the Office of River Protection, as noted above, Bechtel has had difficulties implementing corrective actions. 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 the WTP. To help avoid such costly mistakes, we made several recommendations to the Department designed to address the procurement related deficiencies we observed.

MANAGEMENT RESPONSE

Management concurred with the report's recommendations and indicated that corrective actions were planned to address the issues identified in the report. Management's response and planned actions are responsive to our recommendations. However, management cited two examples where they believed the audit report contained information that was either taken out of context or was factually inaccurate. Management's comments and our responses are summarized in the body of the report. Management's formal comments are included in their entirety in Appendix 3.

Attachment

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

AUDIT REPORT: PROCUREMENT OF PARTS AND MATERIALS FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT AT THE HANFORD SITE

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PROCUREMENT OF PARTS AND MATERIALS FOR THE WASTE TREATMENT AND IMMOBILIZATION PLANT AT THE HANFORD SITE

PROCUREMENT AND MANAGEMENT OF NONCONFORMING PARTS AND MATERIALS

The Department of Energy (Department) Office of River Protection and its contractor Bechtel National Inc. (Bechtel) did not always effectively execute procurements and material management activities. A key function of Bechtel's procurement process is to ensure that vendors and subcontractors deliver items that conform to the specifications in procurement orders and that the items are ready for installation and use in the Waste Treatment and Immobilization Plant (WTP). However, our review found multiple examples of items that arrived on site but did not conform to specifications and, in some cases, Bechtel did not discover these nonconformances until up to 9 years after delivery. We also found that even when nonconformities were identified, the amount of time between identification and resolution was often excessive. In a number of cases, the nonconformances were not resolved for a year or longer after they were identified. Additionally, in most cases, Bechtel did not recover the full costs from vendors for the resolution of nonconforming items.

Identifying Nonconforming Items

Bechtel did not always identify nonconforming parts and materials delivered to the Hanford Site until years after delivery took place. We reviewed a log of 1,365 Nonconformance Reports (NCRs) and Construction Deficiency Reports (CDRs) issued between 2009 and 2014 that identified nonconformances related to equipment and material procurements. The log indicated 595 of the 1,365 (44 percent) NCRs/CDRs reviewed were initiated 2 or more years after the items had arrived on site. Office of River Protection officials stated that a more standard construction project schedule, where receipt of materials and construction installation are completed within months rather than years, would have allowed for identification of such issues more quickly. Nonetheless, we identified examples of nonconformances identified as late as 9 years after the items were delivered on site. Examples included the following:

- In November 2013, Bechtel officials determined that 55 of the 64 (86 percent) installed stair sections for the High-Level Waste Vitrification facility had stair risers that were out of tolerance. The stair sections had been delivered on site and installed between 2004 and 2012. The nonconformances were considered a safety hazard because the stairs were part of the egress routes from the facility. Bechtel procured the stairs at a cost of $654,000. The initial estimate to repair the nonconforming stairs was $1.8 million. Bechtel issued a backcharge notice and reached a settlement for $900,000 with the supplier in May 2015. However, it should be noted that the nonconformances were not discovered until as much as 9 years after the stairs had been delivered and installed. Bechtel officials stated that they did not discover the nonconformance earlier because they did not check the dimension of the stair riser height and did not have the tools to do so.

- The electrical control panel for the Balance of Facilities Nonradioactive Liquid Waste Disposal System was delivered on site in April 2007, but it was not discovered until December 2013, more than 6 years later, that the panel was not certified by either Underwriters Laboratory or another Nationally Recognized Testing Laboratory as required. Bechtel determined that when the Supplier Quality Representatives looked at the panel, they noted the Nationally Recognized Testing Laboratory certification stickers for components inside of the control panel itself and assumed that the panel as a whole was compliant with specifications. Had the control panel been tested and certified, there would have been an additional certification sticker. Bechtel later determined that the Supplier Quality Representatives were not properly instructed or trained. The nonconformance was discovered by an Office of River Protection inspector during a walk-down of the system in preparation for turnover to operations. Later testing to certify the panel identified several other major deficiencies. These included that the variable frequency drives for the 25 horsepower motors were only rated for 20 horsepower and that the panel had no climate control to protect it from extreme high outside temperatures. The control panel was a portion of the original purchase order for the entire Nonradioactive Liquid Waste Disposal System which totaled $233,381. Bechtel officials estimated it would cost approximately $325,000 to replace the control panel, with the Department bearing the cost.

- In July 2004, Bechtel received a vessel for the WTP High-Level Waste Vitrification facility. It was not until 2011, 7 years later, that Bechtel discovered a nonconformance where the supplier was missing documentation that supported the vessel's safety function. This discovery occurred after we identified the nonconformance in a similar vessel from the same supplier and brought it to Bechtel's attention. In our April 2012 Audit Report on *The Department of Energy's $12.2 Billion Waste Treatment and Immobilization Plant – Quality Assurance Issues – Black Cell Vessels* (DOE/IG-0863), we found that Bechtel had procured and installed vessels in WTP missing the required documentation showing that the vessels were inspected to ensure they were free from defects that could compromise the vessels' safety function. Bechtel is currently working to close out the identified issues. The original cost of the vessel was $985,415. To date, Bechtel officials estimate they had incurred approximately $20,000 in costs to perform the review of the documentation but had not yet determined what actions will need to be taken to validate the missing documentation.

Cost Recovery Efforts

In addition to not identifying nonconforming parts and materials in a timely manner, Bechtel did not always take timely or effective action to recover costs once nonconforming items were identified. Bechtel took 1 year or longer to resolve 301 of the 1,365 (22 percent) NCRs and CDRs reviewed. Furthermore, it did not recover any costs from the vendor for over half of the 157 backcharge records on its backcharge log. Most of Bechtel's contracts include a warranty and backcharge clause. The backcharge clause allowed Bechtel to self-repair or rework an item if it discovered a nonconforming part or material and the vendor is unable or unwilling to do the work. Bechtel could then bill the vendor for the cost of the rework, along with a markup percentage stipulated in the contract with the vendor, ranging between 60 and 100 percent of the

cost of rework. The markup covers overhead and administrative costs. Bechtel officials also stated that the markup covers additional receipt inspections and NCR and CDR dispositioning. However, Bechtel often did not recover any costs or the backcharges were settled at significantly less cost for many of the items, often due to ineffective cost recovery action or because of delays in discovering the nonconforming items or taking cost recovery action. Examples included the following:

- Bechtel employees wrote a CDR in June 2012 identifying equipment that did not meet design requirements. As of October 2014, more than 2 years later, the CDR remained open because Bechtel officials did not consider it a priority. The vendor who supplied the equipment ceased operations in April 2013, leaving Bechtel with no means to recover the equipment repair costs.

- Although Bechtel issued a timely backcharge, it did not recover the full cost of the rework of welds on the High-Level Waste duct support, nor the extra overhead and administrative costs associated with the backcharge effort. The actual direct construction cost for Bechtel to rework the material was $138,822, excluding markup. During negotiations, Bechtel utilized the estimated rather than actual costs of repairs, contrary to the requirements of the negotiation plan. This resulted in only $29,100 being recovered, approximately 20 percent of the construction cost associated with the rework.

- Bechtel did not recover the full cost of rework on coaxial pipe welds. The contractor initially discovered the issue in 2005, but the backcharge was not resolved until 2008. The total backcharge cost, which incorporated other CDRs from the same vendor, was listed at $146,010, excluding markup. However, negotiations between Bechtel and the vendor resulted in a final backcharge value of $28,388, less than 20 percent of the cost of rework. Bechtel officials stated that they felt they had no legal option to pursue the backcharge further, since the vendor was not allowed on site to correct the issues.

- In June of 2009, Bechtel notified a vendor of backcharge issues for 14 different NCRs and CDRs via the Preliminary Notice of Backcharge form. The form asked for a vendor response within 48 hours. However, there was no documentation that the vendor responded to the notice of backcharge and Bechtel did not follow up on the issue until October 2010. Bechtel eventually canceled the backcharge due to the age of the NCRs and CDRs, thus recovering none of the necessary repair or rework costs.

- In December 2003, Bechtel notified a vendor of a backcharge related to a vessel with quality issues. However, Bechtel made the decision to cancel the backcharge 3 months later to "ensure cooperation" from the vendor and expedite the testing and repair of the vessel. Subsequently, Bechtel paid the vendor more than $200,000 to make the necessary repairs.

The Office of Inspector General identified similar issues regarding the use of warranties at other sites. In our June 2010 report on *Management Controls over Warranties Involving Newly Constructed and Renovated Facilities at National Defense Laboratories* (OAS-M-10-02), we found that National Nuclear Security Administration laboratories had not always utilized

available warranties but instead performed needed repairs or replacements themselves with the Department bearing the cost. We estimated that repair work performed at three laboratories likely incurred $1.5 million for work that was covered by warranties between fiscal years 2004 and 2008; these funds could have been used for direct mission and other mission support work.

Contributing Factors

The issues we identified were due to weaknesses in Bechtel's quality assurance program for identifying nonconforming parts and deficiencies in recovering costs from vendors for nonconformances. Specifically, nonconforming parts and materials delivered to the site went undetected for long periods, or costs were not successfully recovered because Bechtel did not always effectively implement its policies and procedures regarding nonconforming items. Additionally, Bechtel's priority for resolving NCRs/CDRs did not ensure that they were resolved in a timely manner. Bechtel's backcharge process also had several weaknesses that reduced its effectiveness. Furthermore, although Bechtel was taking action to correct some of these weaknesses, it had not always been successful in effectively implementing corrective actions in the past. Contributing to these factors was the lack of a requirement in Bechtel's contract for the timely identification and replacement or correction of nonconforming items, in accordance with the Federal Acquisition Regulation (FAR). Also contributing was inadequate Department oversight of Bechtel's procurement and material management activities.

Implementation of Identification Procedures

Bechtel's procedures for ensuring that procured parts and materials met specifications and requirements were not always implemented effectively. Since 2012, a number of incidents have been identified in assessments and reviews performed by the Office of River Protection where procedures were not adequately followed. These problems included incomplete verification that vendor design submissions met specifications and source verification and receipt inspections were either not complete or did not follow procedures. Additionally, Bechtel found that it had provided inadequate training to personnel performing inspections of electrical components. Examples of deficiencies identified by the Office of River Protection include the following:

- Bechtel did not properly resolve issues associated with vendor-submitted calculations for the sizing of an uninterruptable power supply battery. Bechtel's Quality Assurance Manual required design analyses to be planned, controlled, and documented. Contrary to this requirement, Bechtel reviewed the supplier document and allowed work to proceed subject to resolution of several comments. However, Bechtel was unable to provide any support showing that the calculations were either resubmitted or that the comments had been resolved by the vendor.

  In response to our draft report, the Department stated that this example lacked appropriate context by not acknowledging that on November 17, 2010, the contractor removed the batteries from the original order placed with the vendor, eliminating the need for the vendor to resolve the battery calculations. We agree that more context could be added, but we believe that the issue remained serious even with additional context. Specifically, the Department's comments omitted the fact that the batteries were not removed from the

original order until 3 years after the calculations were first submitted to Bechtel by the vendor in August 2007. At the time the calculations were submitted, Bechtel requested the vendor provide clarification and resubmit the calculations, which should have taken 10 working days, according to the requirements in the Material Requisition. However, in the 3-year period, action was not taken to resolve this issue, and Bechtel failed to follow its procedures to follow up on the request for revision.

- A Bechtel inspector could not provide documentation that a critical step involving verification of conformance of material to specified requirements was performed during source verification inspections for the High-Level Waste Vitrification facility acid waste vessel demisters. Bechtel procedures require that these verifications be documented in the Source Verification Reports for the Material Acceptance Plan. Without documentation there is uncertainty whether the verification work was actually completed because the demisters became inaccessible after further fabrication.

- The Receiving Inspection and Test Inspectors inappropriately used a sampling approach designed for testing of like items when they performed the receiving inspection for carbon bed absorber crane rail and supports and Low-Activity Waste melter parts. According to Bechtel's procedures, inspectors should only use sampling to test items when they are from a single stock code, a common fabrication process, or a single manufacturing run or process. However, the items tested were nonhomogenous and did not meet the criteria to use sampling. Instead, each item should have been tested individually.

- Bechtel had accepted 15 uninterruptible power supplies that had been certified to Canadian, but not to U.S., standards and were thus nonconforming to specifications. A causal analysis performed by Bechtel determined that both the responsible engineer and the supplier quality representatives were not trained sufficiently to properly evaluate whether electrical equipment met the Nationally Recognized Testing Laboratory certification requirements. This was the same reason cited for Bechtel's acceptance of the previously mentioned electrical control panel for the Balance of Facilities Nonradioactive Liquid Waste Disposal System.

Priorities for Resolving Nonconformance

Delays in resolving nonconformances, along with the low rate of recovery for backcharges, can be attributed, in part, to Bechtel's priorities for addressing nonconforming items and weaknesses in Bechtel's backcharge process. In 2010, Bechtel performed a statistical analysis of the factors that affect the recovery rates for backcharges. Among the factors that had an impact, the analysis found that the length of time it takes to identify a vendor deficiency was the one critical factor in determining the rate of return for backcharges. The analysis also found that the backcharge cycle time had a "statistically significant" impact on recovery rates. However, in determining the priority for resolving outstanding NCRs/CDRs, Bechtel officials stated they did not consider the length of time that had elapsed since the nonconformance had been identified. Additionally,

Bechtel determined that weaknesses in the backcharge process, such as a lack of notification of key officials when a backcharge opportunity existed and the complexity of the process, further contributed to the ineffectiveness in resolving nonconformances.

In spite of these factors, Bechtel did not schedule the resolution of an NCR/CDR based on its age. Rather, first priority was given to resolving those nonconformances that would have a near-term impact on the critical path for the construction of various WTP facilities that have been established as the highest priority. Bechtel officials indicated that there is a high priority for resolution of nonconformances for Balance of Facilities and the Low-Activity Waste Vitrification facility to support turnover of those facilities to operations and that the age of the NCR/CDR is usually not a factor. Although this approach appears reasonable, it makes it more difficult to resolve nonconformances and affects the ability to recoup costs by increasing the time to complete the resolution and backcharge processes for those items not on the critical path. These delays decrease the rate of recovery of costs from the vendors and increase the risk that vendors cannot or will not resolve these issues in some cases. Thus it would seem to be prudent to further consider the age and cost of the NCR/CDR when setting priorities for resolution of nonconforming items.

Backcharge Procedures

Furthermore, weaknesses in Bechtel's backcharge process precluded the effective collection of costs from vendors associated with resolving nonconformances. In October 2014, Bechtel completed a self-assessment of its backcharge procedure and identified a number of weaknesses in the process. Bechtel's process did not include formal steps for identifying and notifying Procurement when nonconformities existed that warranted a backcharge. For example, the initiator of an NCR/CDR was not required to notify the buyer of the identified nonconformance, and report forms did not contain an entry field that identified potential backcharges. Additionally, the backcharge process was considered cumbersome, time-consuming, and difficult to execute. For example, the process required the completion and approval of a number of forms before Construction could start work on the repairs. The self-assessment also identified that the Construction Site Managers were only aware of backcharges when required to sign the Authorization to Collect Backcharge form after work had been completed. However, according to Bechtel's backcharge procedure, the Construction Site Manager is responsible for ensuring the compliance with the procedure and deciding the merit of self-performance, backcharge, or cancelation.

Bechtel Corrective Actions

In March 2014, Bechtel issued a Managed Improvement Plan addressing a number of findings and other issues identified by the Office of River Protection and other external reviewers. Revision 1 of the Plan included 51 specific initiatives to strengthen its programs in the areas of Quality, Engineering, Nuclear Safety Engineering, and Procurement, including key initiatives related to our findings. It is commendable that Bechtel is in the process of implementing corrective actions to address many of the issues identified in this report. However, Office of River Protection officials noted that Bechtel has initiated corrective actions in the past only to have the issues reappear over time. Examples include the following:

- A 2014 Bechtel self-assessment of the backcharge process noted that a Process Improvement Project (PIP) was developed for the program in 2010, but Bechtel was not successful in addressing all of the recommendations. The self-assessment noted there was no evidence to suggest that the Implementation and Control Plans were effectively monitored or managed since completion of the PIP in October 2010. It should be noted that institutionalizing the improvements was a major concern in the development of the PIP and was based on past attempts to improve the backcharge process. Also, although Bechtel had determined that the length of time it takes to identify nonconformances was the critical factor in determining the rate of recovery on backcharges, we found the PIP did not include steps to address this issue.

- In response to an Office of River Protection finding that Bechtel's implementation of receipt inspection, source verifications, and review of supplier submittals was not fully effective, a December 2012 Bechtel Project Issues Evaluation Report determined the apparent cause to be that timely actions identified in the casual analysis of previous findings were not completed.

- A 2013 Bechtel audit on the handling of nonconformances noted that discussions with Engineering and Environmental Equipment Qualification management "resulted in the acknowledgement of long-standing issues regarding incomplete equipment qualification, ineffective extent of condition, and ineffective corrective action." The audit also noted that the closure of one corrective action report had "resulted in received and installed components and material requisitions that do not meet the qualification parameters. This issue has not received adequate resolution to date despite multiple subsequent [Project Issues Evaluation Reports]."

Timelines for Resolving Nonconformance

Problems with resolving nonconforming items were further compounded by Bechtel's procedures for controlling and monitoring the resolution process. A 2013 Bechtel assessment found that "there is not a procedural requirement for the timeliness of NCR/CDR disposition and closure." According to management, they are closed on a priority basis. We noted that Bechtel officials stated it had a metric for resolution of the NCR/CDR backlog for approximately 5 years, with the goal of closing 50 percent of the previous year's open NCRs/CDRs. However, an analysis of Bechtel records indicated that the contractor had lowered the goal for the past several years to 33.4 percent, which they generally met. Furthermore, the records showed that the total number of open NCRs/CDRs had been increasing from year to year. Bechtel's assessment also "determined that there are a number of NCRs and CDRs that have been open for an extended period of time," noting that if there was no work taking place in a facility, there was not necessarily going to be a concerted effort to close NCRs/CDRs for items in the facility.

Contributing further to the lack of a time requirement for resolving nonconformances, Bechtel officials informed us that although corporate headquarters maintains a metric for the timely closure of nonconformances on its other projects, Bechtel's WTP project does not. Instead, the WTP project relies on the backlog metric to maintain focus on minimizing the number of open NCRs/CDRs that are directly related to the highest priority work, while acknowledging that

some nonconformances are not being worked specifically as part of the project's prioritization process. Failure to have a time requirement and track the progress for resolving nonconformances reduces Bechtel's opportunity to recoup the costs of fixing these nonconformances from the vendors and subcontractors.

This approach is in contrast to the requirements of FAR 52.246-3(f), which calls for the replacement or correction of nonconforming items to be completed no later than 6 months after acceptance of the delivered items. The clause establishes guidance for the inspection of supplies and services, including things such as components, intermediate assemblies, and end products, which are purchased under cost reimbursable contracts. However, this clause was not included in Bechtel's contract with the Department. Current and former Office of River Protection contracting officials explained that the reason for not including the clause was that the contract with Bechtel was a construction contract and not a supply contract. However, one Office of River Protection contracting official indicated that they could not identify any reason why the clause could not be included in the contract. In our judgment, although Bechtel has a construction-type contract with the Department, the contractor is acting on behalf of the Government to construct WTP, a Government-owned facility. In constructing WTP, Bechtel has done extensive business with a number of vendors and subcontractors, acquiring $4 billion in parts and materials through the end of fiscal year 2014. Therefore, we believe the FAR clause or similar requirements regarding the timeliness of performing inspections of supplies and services should be incorporated into Bechtel's contract, as appropriate for the Waste Treatment and Immobilization Plant project.

Department Oversight

The Department had not always provided effective oversight of certain portions of Bechtel's procurement and material management activities. To its credit, the Office of River Protection had performed many oversight functions, including assessments and surveillances. The selection of areas of focus for oversight is based on risk, with areas of higher risk receiving greater attention. Thus not all areas addressed during our audit would have received the same level of review as we performed. However, officials stated that due to limited resources the Office of River Protection did not provide effective oversight of certain aspects of Bechtel's procurement and material management activities related to backcharges. Instead, the Office of River Protection relied on Bechtel to inform the Department of issues. For example, Department officials stated they were familiar with Bechtel's backcharge procedure; however, they relied primarily on Bechtel to self-police these activities. Yet, as its 2014 self-assessment noted, Bechtel experienced difficulties in carrying out its backcharge program over a number of years. When asked whether they reviewed Bechtel's backcharge log, Office of River Protection officials stated that they had not done so. The officials said that they met with Bechtel procurement officials on a regular basis and would sometimes discuss specific backcharge cases; however, the discussions were generally limited to only high visibility issues, as would be consistent with a risk-based approach.

Opportunity for Cost Savings

We recognize that the Waste Treatment and Immobilization Plant requires the procurement of a number of highly complex and one-of-a-kind parts and equipment and that no system of internal controls can identify all nonconformances before parts and materials arrive on the Hanford Site. We noted that Bechtel has issued a plan to address a number of priority level 1 findings issued by the Office of River Protection. We have also noted, however, the difficulties Bechtel experienced in implementing corrective actions. If improvements are not made to Bechtel's processes and procedures for identifying and resolving nonconformances in procured items and materials, it will continue to unnecessarily increase the cost to the Department for the construction of the WTP. For example, in its 2014 Managed Improvement Plan, Bechtel estimated the cost to resolve nonconformances after installation to be three times the cost if resolved earlier in the process when the system turnover schedule is on the critical path. Additionally, Bechtel's 2010 backcharge process improvement project determined that the time it takes to complete a backcharge is a critical factor affecting the rate of recovery for backcharges. It estimated that Bechtel could save $1.9 million through 2016 by implementing changes to its backcharge process. Furthermore, by not identifying nonconforming items in a timely manner, the Department may be adversely affected by vendors going out of business, resulting in Bechtel having to resolve the nonconformance and passing the costs on to the Department.

RECOMMENDATIONS

To help ensure that nonconforming parts and materials are identified and resolved in a timely manner, we recommend that the Assistant Secretary for Environmental Management direct the Manager of the Office of River Protection to:

1. Ensure that Bechtel personnel fully comply with procurement and property management policies and procedures that address the weaknesses identified in this report;

2. Ensure that Bechtel considers all factors as appropriate in determining priorities for resolving nonconforming parts and materials;

3. Ensure that Bechtel implements corrective actions for identified weaknesses and monitors implementation to ensure their effectiveness;

4. Include FAR 52.246-3, or similar language, establishing timeliness of performing inspections of supplies and services and resolving nonconformances, into Bechtel's contract with the Department, as appropriate for the Waste Treatment and Immobilization Plant project; and

5. Strengthen oversight by placing additional emphasis on the timely identification and resolution of nonconformances and the backcharging of subcontractors and vendors.

MANAGEMENT RESPONSE

Management concurred with each of the report's recommendations and indicated that corrective actions were planned to address the identified issues. For example, the Department will direct Bechtel to perform a review of its policies and procedures and take necessary action to ensure they address requirements and are appropriately implemented. Additionally, the Department will develop and perform annual assessments of Bechtel to address the areas identified in the report. The Department will also include evaluation criterion related to the issues of nonconformances and backcharging in Bechtel's Performance Evaluation and Measurement Plans starting in calendar year 2016. Management, however, stated that the audit had not identified any findings that had not been previously identified by either the Office of River Protection or Bechtel. Management also stated that an example regarding the use of Material Acceptance Plans was factually inaccurate.

AUDITOR COMMENTS

Management's comments and proposed actions are responsive to our recommendations. However, we disagree with management's comment that the report did not identify any issues that had not been previously identified by either the Department or Bechtel. Our report acknowledges the issues identified by the Department and Bechtel. However, several new issues we identified in this report include the following: (1) the magnitude of the issue with nonconforming parts and material, (2) the Office of River Protection's ineffective oversight over Bechtel's backcharging practices, and (3) Bechtel's problems resolving root causes of these issues. We agree with the Department's comment that the example cited in our report regarding Material Acceptance Plans, in which we relied on an Office of River Protection surveillance report finding, was factually inaccurate. As a result, we deleted that example from the report.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The objective of this audit was to determine whether the procurements and material management activities process at Waste Treatment and Immobilization Plant (WTP) had been effectively executed.

Scope

The audit was conducted between December 2013 and November 2015. The scope of the audit was limited to the procurement and management of parts and materials by Bechtel National Inc. (Bechtel) for the WTP located on the Hanford Site near Richland, Washington. The audit included a review of 1,365 Nonconformance Reports (NCRs) and Construction Deficiency Reports (CDRs) issued between 2009 and 2014, as well as additional sources of data that were relevant to the issue under audit. We conducted work at the Department of Energy (Department) Office of River Protection, located in Richland, Washington, and at Bechtel. The audit was conducted under Office of Inspector General project number A14RL012.

Methodology

To accomplish the audit objective, we:

- Reviewed laws, regulations, and program guidance applicable to procurement and property management activities within the Department;
- Interviewed key Department and Bechtel officials to discuss the processes and procedures used to inspect procured parts and materials for WTP;
- Obtained and analyzed assessments, surveillances, and other reviews of Bechtel's procurement and property management systems;
- Obtained and reviewed data regarding the identification and resolution of nonconforming parts and materials; and
- Discussed with Department and Bechtel officials concerning procedures and practices regarding backcharging of vendors and subcontractors.

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, the audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the objective. We considered the *GPRA Modernization Act of 2010* as necessary to accomplish the objective, and we determined 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 did rely on computer-processed information in Bechtel's nonconformance reporting system to achieve our audit objective. We confirmed the validity of the NCR and CDR logs we were provided by examining system controls, to include data input. We also compared a judgmental sample of NCR/CDR log data to the electronic source documents and determined the data was accurate for our purpose. We held an exit conference with the Department on October 19, 2015.

PRIOR REPORTS

- 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 review noted that Bechtel National Inc. (Bechtel) had not subjected design changes requested by suppliers to the required review and approval by Bechtel's Environmental and Nuclear Safety Group or properly verified that deviations from design requirements that could affect nuclear safety were implemented. This occurred because Department of Energy (Department) oversight of Bechtel's quality assurance program lacked focus and 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. 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.

- Audit Report on *The Department of Energy's $12.2 Billion Waste Treatment and Immobilization Plant – Quality Assurance Issues – Black Cell Vessels* (DOE/IG-0863, April 2012). The review identified a number of instances where quality assurance requirements were not completely followed for processing vessels installed in black cells and/or hard-to-reach areas. Specifically, the audit found that Bechtel had not obtained or maintained (1) weld maps; (2) information on welding procedures, qualification on welders, materials used in the vessels; (3) positive material tests; and (4) radiographs showing the integrity of welds. These weaknesses in quality assurance records occurred because of deficiencies in Bechtel's implementation of its quality assurance program and a lack of Department oversight. Specifically, Bechtel employed inspectors who lacked the appropriate qualifications, and the contractor's receipt and inspection procedures were deficient in that reviews of quality assurance records for the vessels were limited to basic procedures. Furthermore, the Departments failure to identify the weaknesses in Bechtel's processes raises questions as to the quality of the Department's contract administration and oversight. Without ensuring that quality assurance improvements are in place and operating effectively and that the necessary quality assurance records are acquired, the Department may not be able to demonstrate that the Waste Treatment and Immobilization Plant (WTP) facilities are ready for operation and will operate as intended.

- Audit Report on the *Management Controls over Warranties Involving Newly Constructed and Renovated Facilities at National Defense Laboratories* (OAS-M-10-02, June 2010). The review determined that the National Nuclear Security Administration laboratories had not always utilized available warranties but instead performed needed repairs or replacements themselves with the Department bearing the cost. This occurred because the laboratories had not implemented effective controls to ensure that the warranty

provisions were enforced. For example, managers did not provide warranty documentation to personnel responsible for requesting, planning, and performing work orders. The review estimated that repair work performed at the three laboratories likely incurred $1.5 million for work that was covered by warranties between fiscal years 2004 and 2008; these funds could have been used for direct mission and other mission support work.

- Audit Report on *The Procurement of Safety Class/Safety-Significant Items at the Savannah River Site* (DOE/IG-0814, April 2009). The review determined that the Department had procured and installed safety-class and safety-significant structures, systems, and components that did not meet NQA-1 quality standards. Specifically, the audit identified multiple instances in which critical components did not meet required quality and safety standards. Among other conditions, the audit found that three structural components were procured and installed by the prime contractor at Savannah River during construction of the Mixed Oxide Fuel Fabrication Facility that did not meet the technical specifications for items relied on for safety. These substandard items necessitated costly and time-consuming remedial action to ensure that nonconforming materials and equipment would function within safety margins. These failures were attributable to inadequate attention to quality assurance at Savannah River. Departmental controls were not adequate to prevent and/or detect quality assurance problems. For example, Federal and prime contractor officials did not expressly require that subcontractors or lower-tiered vendors comply with quality assurance requirements. Additionally, management did not effectively communicate quality assurance concerns between the several Departmental program elements operating at Savannah River. The procurement and installation of these nonconforming components resulted in cost increases. Additionally, these weaknesses could have permitted the procurement and installation of safety critical components that did not meet quality assurance standards. In a worst case scenario, undetected, nonconforming components could fail and injure workers or the public.

- Audit Report on the *Quality Assurance Standards for the Integrated Control Network at the Hanford Site's Waste Treatment Plant* (DOE/IG-0764, May 2007). The review determined that the WTP control system acquired by the Department did not meet applicable quality assurance standards. Bechtel's specifications, which were approved by the Department, required the installation of a control system that met quality assurance standards for nuclear facilities, or equivalent standards. Yet Bechtel failed to impose parallel requirements on the subcontractor supplying the control system. This situation occurred because of weaknesses in Bechtel's procurement system. Specifically, Bechtel had not (1) performed a supplier evaluation, (2) clearly set forth quality assurance standards to be followed, (3) consistently applied quality assurance requirements, or (4) appropriately documented key elements in the procurement process. Additionally, the Department failed to adequately monitor Bechtel's procurement of the control system. Because of these weaknesses, the Department is at risk that the control system will not perform as needed thereby affecting the schedule, cost, and safety of the $12 billion project.

MANAGEMENT COMMENTS

Department of Energy
Washington, DC 20585

SEP 29 2015

MEMORANDUM FOR RICKEY R. HASS
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 "Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site"

Thank you for the opportunity to review the Office of Inspector General (OIG) subject draft report. After completing our review, we are encouraged that OIG did not identify any findings that had not been previously identified by the Office of River Protection (ORP) or by the Waste Treatment and Immobilization Plant (WTP) contractor. The thoroughness of the review is evident by the 18 month duration, the number of individuals interviewed (more than 60 ORP and WTP contractor employees), and the amount of documentation provided to OIG (more than 200,000 pages). As acknowledged in OIG's draft audit report, many of the issues identified in the report were previously identified by ORP or self-identified by the WTP contractor, with corrective actions well on their way.

The OIG draft audit report contains some comments that are taken out of context or are factually inaccurate. Two examples follow:

Example 1: The first bullet under the section entitled, "Implementation of Identification Procedures," states, "However, [the WTP Contractor] was unable to provide any support showing that the calculations were either resubmitted or that the comments had been resolved by the vendor;…" This citation, related to procurement of uninterruptable power supply (UPS) batteries, does not acknowledge that on November 17, 2010, the WTP Contractor removed the UPS batteries from the original order placed with the vendor. That action eliminated the need for the vendor to resolve the battery calculations.

Example 2: In the second bullet under the same section, statements imply that the WTP contractor used a single material acceptance plan (MAP) for the procurement of two vessels being fabricated by different vendors. This comment fails to acknowledge the full series of events that provide context for this issue. ORP transmitted a letter to BNI forwarding surveillance report S-12-TRS-RPPWTP-003, dated July 2, 2013, to the WTP contractor documenting that a single MAP was being used for the two vessels with different materials.

At that time the WTP contractor was procuring both vessels from the same vendor but the issue was rectified when the WTP contractor removed one of the vessels from the scope of work from the original vendor and awarded it to a second vendor with a separate MAP. DOE recognizes that at the time the award was made to the second vendor, the WTP contractor did not have a new MAP in place; however, the contractor's procedures allowed it to put a new MAP in place, after the award, as long as the WTP contractor had not performed any activity associated with the MAP. These actions resulted in rectifying the issue and rendered it obsolete with no impact to mission cost or schedule.

The draft OIG report identifies five recommendations, which EM accepts and will implement actions to address them, with the exception of those parts that are not applicable due to factual inaccuracies. A summary of the actions planned to address each of those recommendations is delineated in the attachment.

If you have any questions, please contact me or Mr. J. E. Surash, Deputy Assistant Secretary for Acquisition and Project Management, at (202) 586-6382.

Attachment

cc: Kenneth Picha, Jr., EM-20
J. E. Surash, EM-50

Attachment - Department Response to the Recommendation of the Office of Inspector General Draft Report DOE/IG-XXXX on "Procurement of Parts and Materials for the Waste Treatment and Immobilization Plant at the Hanford Site"

Recommendations:

To help ensure that nonconforming parts and materials are identified and resolved in a timely manner, we recommend that the Acting Assistant Secretary for Environmental Management direct the Manger, Office of River Protection to:

1. **Ensure that Bechtel personnel fully comply with procurement and property management policies and procedures that address the weaknesses identified in this report:**

   The Office of River Protection (ORP) will direct the Waste Treatment and Immobilization Plant (WTP) contractor to perform a review of its procurement and property management policies and procedures and take necessary actions to ensure these policies and procedures address requirements and are being appropriately implemented, including addressing the issues identified in this OIG audit. ORP will also direct the WTP contractor to appropriately assess previously procured materials to ensure they were adequately inspected for compliance with contract procurement requirements.

   ORP will develop an assessment and perform annual assessments of the WTP contractor's procurement and property management policies and procedures, subcontractor/vendor-related Non-Conformance Report/Conformance Deficiency Report (NCR/CDR) identification and disposition processes, and back-charge process to ensure the contactor is in compliance with contract requirements. These assessments will be performed utilizing a cross-functional team typically consisting of engineers, contract specialists, property management specialist, facility representatives, and quality assurance specialists, and will focus, in part, on the WTP contractor's timely identification of non-conforming materials and timely implementation of its back-charging process.

   ORP will also include the timely identification and resolution of subcontractor/vendor-related non-conformances and back-charges as an evaluation criteria in the calendar year 2016 Performance Evaluation and Measurement Plan for the WTP contractor.

   Completion of this recommendation will be based on assessment completion and the performance of the first (baseline) assessment. However, to ensure long-term effectiveness, ORP will continue these annual assessments and verify closure of any Priority Level 1 or 2 findings identified during them until completion of the WTP Project.

2. **Ensure that Bechtel considers all factors as appropriate in determining priorities for resolving non-conforming parts and materials:**

   ORP will ensure the WTP contractor's policies and procedures for determining priorities for resolving non-conforming parts and materials specifically identify those factors that are to be considered, such as:

   - Impact of the NCR/CDR to the overall schedule
   - Age of the NCR/CDR
   - Dollar value associated with the NCR/CDR

   As part of ORP's annual assessments (identified under corrective action for recommendation one above), ORP will evaluate the WTP contractor's backlog of subcontractor/vendor-related CDR/NCRs to ensure that the factors discussed above are considered as appropriate.

   Completion of this recommendation will be based on assessment completion and the performance of the first (baseline) assessment. However, to ensure long-term effectiveness, ORP will continue these annual assessments and verify closure of any Priority Level 1 or 2 findings identified during them until completion of the WTP Project.

3. **Ensure that Bechtel implements corrective actions for identified weaknesses and monitors implementation to ensure their effectiveness:**

   ORP will require the WTP contractor to submit a corrective action plan for identified weaknesses in this OIG audit report. The contractor will also be required to provide quarterly updates on the responsive corrective actions until verified as closed.

   ORP will verify corrective action implementation by performing closure reviews of each of the contractor actions, and later, perform an overall effectiveness review of the contractor's subcontractor/vendor-related NCR/CDR identification and disposition processes. This effectiveness review will include the contractor's process for back-charges against subcontractors/vendors.

4. **Include Federal Acquisition Regulation 52.246-3, or similar language establishing timeliness of performing inspections of supplies and services and resolving nonconformances, into Bechtel's contract with the Department, as appropriate for the Waste Treatment and Immobilization Plant Project:**

   ORP will resolve by including the issue of subcontractor/vendor-related non-conformance and back-charges, as evaluation criterion in the Calendar Year 2016 and beyond Bechtel National Inc. (BNI) Performance Evaluation and Measurement Plans (Objective IV) for the Waste Treatment Plant (WTP). ORP will also include the clause language in the next proposed major contract change package for renegotiation at a future date, in order to include it in the contract with bilateral acceptance.

5. **Strengthen oversight by placing additional emphasis on the timely identification and resolution of non-conformances and the back-charging of subcontractors and vendors:**

ORP will require the WTP contractor to develop and implement corrective actions to address these OIG audit recommendations, including addressing legacy procurement receipt inspection issues, and develop metrics to monitor and take actions to reduce the backlog of subcontractor/vendor-related NCR/CDRs and ensure timely resolution and back-charging of high-cost subcontractor/vendor-related non-conformance dispositions as applicable.

ORP will review and approve the WTP contractor's corrective action plan, and once completed, assess and verify that each action is adequately closed. In addition, as stated above, as part of ORP's annual assessments (identified under corrective action for recommendation one above), ORP will annually evaluate the WTP contractor's progress in addressing the current and backlog of subcontractor/vendor-related CDR/NCRs, including ensuring appropriate back-charging actions are being processed.

In addition, ORP will include the timely identification and resolution of non-conformances and back-charges of subcontractor/vendor materials as an evaluation criteria in the calendar year 2016 Performance Evaluation and Measurement Plan.

ORP actions to address this recommendation will be considered completed when the responsive WTP contractor corrective actions are verified closed, and the first (baseline) assessment has been performed and issued. However, ORP will continue these annual assessments and verify closure of any Priority Level 1 or 2 findings identified during them until completion of the WTP Project.

FEEDBACK

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

If you want to discuss this report or your comments with a member of the Office of Inspector General staff, please contact our office at (202) 253-2162.