



OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

AUDIT REPORT

DOE-OIG-23-34

September 2023

**BECHTEL NATIONAL, INC.'S COST
PROPOSAL ESTIMATES FOR BASELINE
CHANGE PROPOSAL 02 AND ITS
CONTRACT MODIFICATION 384
COUNTERPART FOR THE WASTE
TREATMENT AND IMMOBILIZATION
PLANT**



Department of Energy
Washington, DC 20585

September 28, 2023

MEMORANDUM FOR THE MANAGER, OFFICE OF RIVER PROTECTION; AND
DIRECTOR, OFFICE OF ACQUISITION MANAGEMENT

SUBJECT: Audit Report on Bechtel National, Inc.'s Cost Proposal Estimates for Baseline Change Proposal 02 and Its Contract Modification 384 Counterpart for the Waste Treatment and Immobilization Plant

The attached report discusses our review of Bechtel National, Inc.'s cost proposal estimates for baseline change proposal 02 and its contract modification 384 counterpart for the Waste Treatment and Immobilization Plant. We conducted this audit from May 2021 through May 2022 in accordance with generally accepted government auditing standards. This report contains eight recommendations that, if fully implemented, should help ensure that future cost proposals comply with the applicable regulations and policies. Management concurred with three recommendations, nonconcurred with four recommendations, and partially concurred with one recommendation. With respect to the partial concurrence, the Office of Management's response is a nonconforming response; however, the action it plans to take is responsive to our recommendation.

We appreciated the cooperation of your staff during the audit.

A handwritten signature in black ink, appearing to read "Jennifer L. Quinones".

Jennifer L. Quinones
Deputy Inspector General
Office of Inspector General

cc: Deputy Secretary
Chief of Staff



Department of Energy Office of Inspector General

Bechtel National, Inc.'s Cost Proposal Estimates for Baseline Change Proposal 02 and Its Contract Modification 384 Counterpart for the Waste Treatment and Immobilization Plant (DOE-OIG-23-34)

WHY THE OIG PERFORMED THIS AUDIT

In February 2014, the Department of Energy, Office of River Protection requested Bechtel National, Inc. (Bechtel) prepare a cost proposal for designing modifications to the Waste Treatment and Immobilization Plant to enable a direct feed to the Low-Activity Waste Facility and completing and commissioning the Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory by December 31, 2021.

The Office of River Protection received Bechtel's proposal in September 2014. We initiated this audit to determine whether Bechtel utilized reasonable cost proposal estimates for baseline change proposal 02 and its contract modification 384 counterpart.

What Did the OIG Find?

We found that Bechtel did not utilize reasonable cost proposal estimates for baseline change proposal 02 and its contract modification 384 counterpart at the Waste Treatment and Immobilization Plant. First, Bechtel did not always use adequate estimating practices. Second, Bechtel was unable to reconcile management reserve amounts to identified risks and demonstrate how estimates reconciled to the Risk Management Plan. Finally, Bechtel's use of its Monte Carlo simulation was not consistent with industry practice, which resulted in overstated hours and costs.

We attributed these issues to inadequacies in Bechtel's estimating system and Department oversight. We identified several weaknesses related to Bechtel's labor hour estimates. The labor hour estimates account for approximately \$1.8 billion of the total proposed \$4.5 billion.

What Is the Impact?

These issues resulted in estimates that were likely unreasonable, could not be adequately supported, and potentially benefited Bechtel improperly and disadvantaged the taxpayer. In addition, the issues identified indicate an inadequate estimating system could impact every future estimate Bechtel makes on this project. We identified over 1 million direct labor hours added through Bechtel's questionable application of Monte Carlo.

What Is the Path Forward?

To address the issues identified in this report, we have made eight recommendations that, if fully implemented, should help ensure that the Department receives cost proposal estimates that are based on reasonable estimates.

BACKGROUND

To address the environmental risk posed by the waste stored at the Hanford Site Tank Farms, the Department of Energy is constructing a treatment facility called the Waste Treatment and Immobilization Plant (WTP). The WTP's mission is to treat the 56 million gallons of chemical and radioactive waste into a stable glass form for permanent disposal. In December 2000, the Department awarded Bechtel National, Inc. (Bechtel) a \$4.3 billion cost-reimbursement contract to design and complete the WTP. In June 2002, workers poured the first yard of concrete for the WTP. The WTP construction project is the largest of its kind and was originally comprised of five major facilities: Pretreatment, Low-Activity Waste (LAW) Vitrification, High-Level Waste Vitrification, Analytical Laboratory, and the Balance of Facilities.

In August 2012, the Office of River Protection (River Protection) directed the contractor to halt production engineering work and construction on portions of the WTP. In November 2012, the Secretary of Energy redirected River Protection's focus away from significant construction and production engineering effort on the High-Level Waste and Pretreatment facilities and onto the LAW Facility and its support facilities. To begin treating waste as soon as practicable, the Department developed a sequenced approach that would treat low-activity waste first and as soon as 2022.

In December 2016, the Department approved baseline change proposal (BCP) 02 and the corresponding contract modification 384, which integrated the completion of the WTP LAW Facility, Balance of Facilities, and the Analytical Laboratory. To develop its cost proposal estimates, Bechtel utilized several estimating techniques, including a Monte Carlo simulation, cost estimating relationships (CERs), and unit rates.

- A Monte Carlo simulation is a computerized mathematical technique that allows users to account for risk in quantitative analysis and decision making. This simulation performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has inherent uncertainty. It produces distributions of possible outcome values.
- CERs are derived from a technique used to estimate a particular cost or price by using an established relationship with an independent variable. The important aspect of developing CERs is demonstrating a measurable relationship. An example of a simple CER is the relationship between nails and two-by-fours; when more two-by-fours are added to a project, the number of required nails increases.
- Bechtel applied unit rates to estimated quantities for many of its commodity installation estimates. For example, if Bechtel historically took 5,000 hours to install 1,000 feet of pipe, its performance report would show a unit rate of 5 (5,000 hours/1,000 feet) hours per foot. Accordingly, if Bechtel proposed 2,000 feet of pipe, it would estimate 10,000 hours (2,000*5) to complete this task.

In September 2020, Bechtel and some of its subcontractors agreed to pay \$57.75 million to the U.S. Department of Justice to resolve claims that it fraudulently overcharged the Department of Energy in connection with the operation of the WTP. Between 2009 and 2019, Bechtel and its subcontractors admitted to:

- Overcharging the Department for unreasonable and unallowable idle time experienced by craft personnel;
- Failing to schedule and carry out adequate work to keep craft personnel sufficiently occupied and productive, resulting in excessive idle time;
- Management knowledge that craft personnel were experiencing idle time due to failure to assign sufficient work; and
- Improperly billing the Department labor costs for the unreasonable idle time and continuing to do so for years, even after the companies knew they were under investigation for improper billing practices.

Considering the impact that historically overcharged labor hours could have on a proposal, we initiated this audit to determine whether Bechtel utilized reasonable cost proposal estimates for BCP 02 and its contract modification 384 counterpart.

The Department relied on an audit conducted by the Defense Contract Audit Agency (DCAA) of the Bechtel Systems and Infrastructure, Inc.'s¹ cost estimating system in 2006, as well as a Defense Contract Management Agency (DCMA) estimating system approval in 2015. These reviews used the Defense Federal Acquisition Regulation Supplement (DFARS) standard to evaluate the cost estimating system. Although it is not a requirement of the WTP contract, the DFARS 252.215-7002, *Cost Estimating System Requirements*, provides a reference for the acceptability of an estimating system. The DFARS defines an estimating system as the contractor's policies, procedures, and practices for budgeting and planning controls, and generating estimates of costs and other data included in proposals submitted to customers in the expectation of receiving contract awards. The DFARS also defines an acceptable estimating system as one that: (1) is maintained, reliable, and consistently applied; (2) produces verifiable, supportable, documented, and timely cost estimates that are an acceptable basis for negotiation of fair and reasonable prices; (3) is consistent with and integrated with the contractor's related management systems; and (4) is subject to applicable financial control systems. Given the subjective nature of estimating processes, the DFARS provision also focuses on a disclosure requirement so that the Government can make a reasonably informed judgment regarding the contractor's estimating practices.

¹ Bechtel Systems and Infrastructure, Inc. (BSII) is a holding company and Bechtel Group, Inc.'s U.S. Government contracting arm. A cost accounting organization, BSII (Functions & Services) consolidates business units performing Government contracts under one organization. BSII (Functions & Services) serves as both an intermediate home office and a source of direct and/or indirect labor for Bechtel, a major business unit performing Government contracts. Bechtel performs and manages the majority of Bechtel Group, Inc.'s Federal Government contracts.

INADEQUATE ESTIMATING PRACTICES

We found that Bechtel utilized inadequate estimating practices that led to unreasonable cost proposal estimates for BCP 02 and contract modification 384. Specifically, in the development of its estimates, Bechtel did not always use consistent estimating techniques, perform analytical tests of its proposed data, have a process to correct errors in a timely manner, sufficiently utilize historical experience, or produce supporting documentation for the estimates. As part of our review, we examined the supporting documentation for Bechtel's proposed 24.6 million labor hours and approximately \$1.8 billion in proposed labor costs.

Inconsistent Estimating Techniques

Bechtel practiced inconsistent estimating techniques that led to unreasonable cost proposal estimates provided to the Department. Specifically, Bechtel used multiple unit rates for estimating the same commodity, inconsistently applied the number of work hours for full time equivalent (FTE) estimates, and implemented an accounting change without updating its proposal.

In many instances, Bechtel's proposal was inconsistent in its use of unit rates. Specifically, we identified 28 different commodities in which the support contained in Bechtel's proposal had more than 1 unit rate for the same commodity. The disparities between the unit rates used were significant. This inconsistent practice would make it difficult for a proposal reviewer to verify estimate accuracy and for the commodity unit rates to be monitored through Bechtel's monthly quantity unit rate report. Bechtel explained that such differences can arise when there is different work scope involved. In some instances, Bechtel said that the use of multiple unit rates was caused by data entry errors.

Additionally, while Bechtel developed and included a monthly and weekly FTE standard in its submission, it did not use these standards in a consistent manner throughout its proposal. We found Bechtel failed to follow its own guidance and inconsistently applied the number of work hours to the FTE estimates contained in the proposal. Further, personnel we interviewed who were involved in the estimates did not specifically recall the FTE standards from 2014. According to the DFARS 252.215-7002(d)(4)(iii), estimating systems shall ensure relevant employees have sufficient training and guidance to perform estimating tasks appropriately. To improve this area, further training is warranted. Using an appropriate method to adjust all estimates to the standard rates, we recalculated the result to be 122,153 overstated labor hours.

Finally, we observed Bechtel appears noncompliant with Cost Accounting Standard (CAS) 401, *Consistency in Estimating, Accumulating and Reporting Costs*, because it changed its accounting system in 2015 without updating its proposal. The Contracting Officer needs to make a final determination on this noncompliance. When calculating its ratios in 2014 for the construction, start-up, and commissioning CERs, Bechtel utilized accounting data from 2012 through 2013. Bechtel then implemented a significant accounting change prior to completing negotiations that caused the hours estimated through CERs to be inconsistent with how these costs were accumulated. CAS 401-40(a) states that "[a] contractor's practices used in estimating costs in pricing a proposal shall be consistent with his cost accounting practices used in accumulating and

reporting costs.” Bechtel utilized noncurrent CERs because it did not update its estimated CERs based on its new method of accounting before it signed contract modification 384 in December 2016.

Lack of Analytical Testing

When developing its estimates, Bechtel did not always use appropriate analytical methods. In utilizing sound estimating techniques, according to the DFARS 252.215-7002(d)(4)(x) and (xiii), estimating systems shall require the use of appropriate analytical methods, the comparisons of projected results to actual results, and an analysis of any differences. However, Bechtel officials told us that they did not compare the 2014 estimates to actual hours worked, nor did Bechtel perform necessary analytical tests to ensure the accuracy of its Monte Carlo simulation, CERs, or unit rates.

Bechtel did not test the accuracy of its Monte Carlo simulation despite the standard practice of testing simulation results to ensure accuracy, especially when systems are new or adjusted. Bechtel could not provide any evidence of accuracy tests despite evidence that Bechtel had changed Monte Carlo simulations and adjusted its Monte Carlo distributions. We also found that Bechtel limited its number of simulations generated for each line item based on computing time and power constraints without determining the impact on accuracy.

Bechtel also did not validate the causal-beneficial relationship or accuracy of its proposed CERs, increasing the likelihood of inaccurate estimates. During our review, Bechtel did not demonstrate that any significant activities included in these CERs appeared to be driven by incurring direct craft labor.² We also found that Bechtel did not perform accuracy tests, such as comparing CER estimates for a project to incurred direct hours on that same project. Additionally, Bechtel did not monitor its CERs to check whether other independent variables could be more accurate. Further, Bechtel did not document the development of its CERs so the Department or a third party could determine their validity. The use of unvalidated, untested, unmonitored, and undocumented CERs significantly increases the risk of inaccurate estimates.

Finally, we found at least 57 unit rates that Bechtel did not adequately support. We performed analytical procedures and identified an additional 114 unit rates that referenced similar estimate supporting data as the 57 unit rate items we reviewed. Although we did not perform the same level of audit testing, it is likely that these additional 114 unit rates were not adequately supported as well. Bechtel’s basis for these estimates used in the proposal stated that estimated unit rates were from one of its monthly reports. However, our review of the proposed unit rates found Bechtel did not reconcile to the rates contained within this monthly report. Further, when we questioned Bechtel, it was unable to demonstrate that proposed unit rates were supported by actual data from its accounting system or how subject matter experts revised rates for its estimate. Bechtel officials told us that they had not performed a 1-to-1 match to ensure that unit rates aligned with the referenced report.

² Craft labor is typically union employees. They are building and construction trades workers employed for a construction project. They are direct hourly labor who perform construction and associated construction activities. Bechtel craft laborers were the manual workers directly assigned to complete construction, maintenance, and start-up work. Some examples of craft laborers are pipefitters, bricklayers, and electricians.

No Process to Correct Errors in a Timely Manner

Bechtel's complex proposal did not allow the Department and external reviewers to adequately validate estimate accuracy or correct errors in its submission in a timely manner. Bechtel's estimating methodology was complicated and contained thousands of overly complex calculations within extremely large files. Oversized files and the vast number of calculations placed strong reliance on Bechtel's estimating system and made it difficult for Bechtel personnel, auditors, and Department officials to validate estimate accuracy and correct errors in a timely manner in accordance with the DFARS 252.215-7002(d)(4)(vii). For example, a simple task for one FTE to provide training resulted in an estimate with three labor categories, eight lines of calculations, and overtime being added. According to Bechtel personnel, Department officials directed them to estimate at this level of detail.

Underutilization of Historical Experience

Bechtel did not always utilize historical experience in developing portions of its estimate. According to the DFARS 252.215-7002(d)(4)(ix), an adequate contractor's estimating system will "provide for the use of historical experience." Although Bechtel told us it used historical data to develop CERs and unit rates, we found Bechtel did not base a single estimate for hours needed to perform various tasks and scopes of work on actual historical labor hours. Based on the information we obtained, we determined that Bechtel also could not demonstrate how it utilized historical data in its Monte Carlo simulation. Instead, Bechtel relied heavily on subject matter experts to determine the labor hours needed or modify distributions for creating estimates. However, Bechtel did not provide any documentation as to what the subject matter experts used to support the estimates. Bechtel also purported that the Monte Carlo simulation was developed in the 1980s using historical data from the 1960s through the 1970s but did not provide evidence of this claim. Bechtel stated that the quick turnaround time given to prepare its proposal (60 days according to the request for proposal) did not allow it to develop individual estimates based on actual cost data. However, we noted that the Department issued a revised letter granting over 210 cumulative days for proposal preparation.

Unsupported Estimates

Bechtel could not support that it submitted reasonable cost estimates in its proposal because it lacked the necessary documentation. For example, Bechtel could not support the data it used in Monte Carlo distributions. Additionally, Bechtel could not provide the data for the unit rate underlying calculations. Bechtel also could not provide supporting justification for hours added to the proposal or provide supporting documentation to proposal reviewers in a timely manner.

Bechtel could not provide the data used in its distributions that were used to generate its Monte Carlo simulation results. Instead, Bechtel informed us it relied on a group of experts to subjectively modify its distributions in preparation for proposals. Department Guide 413.3-21A, *Cost Estimating Guide*, states that "the quality of the output is dependent on the quality and accuracy of these inputs. Inaccurate estimates of either probability or impact will lead to erroneous project probability outputs and misstatement of needed contingency allowances and/or confidence level." Bechtel agreed that the Monte Carlo distributions used by its Monte Carlo

simulation were more reliant on judgment than empirical data. As a result, we determined that Bechtel could not support the quality of its Monte Carlo simulation outputs, which might be inaccurate and would cause a misstatement of contingency allowances for the project. Bechtel explained that it relied on technical experts to develop risk probability factors based on their expert judgment. However, we still determined that there is room for improvement in this area, and that distributions should be based on data that has been properly evaluated, has included all significant risks, and has been confirmed as accurate to minimize overruns in cost.

Bechtel also could not provide underlying calculations for its proposed unit rates. Bechtel was required to submit with its proposal “the mathematical or other methods used in the estimate” in accordance with the Federal Acquisition Regulation (FAR) 15.408, Table 15-2, *Instructions for Submitting Cost/Price Proposals When Certified Cost or Pricing Data Are Required*. Bechtel’s proposal cited one of its monthly quantity unit rate reports as the source for many estimated unit rates; however, the estimated unit rates did not reconcile to the report. Bechtel explained that these citations referred to unit rates developed by its construction team. However, Bechtel was unable to demonstrate how these unit rates were developed. In addition, Bechtel confirmed that it had cited incorrect support for 18 unit rate estimates. We performed analytical procedures to identify estimates with the same basis of estimate as the 18 unit rates and identified an additional 151 estimates that most likely cited incorrect support.

Bechtel could not provide supporting justification for hours added to the proposal. We found that Bechtel management added hours to the proposal without adequate justification. The supporting documentation provided by Bechtel could not demonstrate how the number of hours were developed or justify why the hours were needed. In addition, Bechtel included 5-month reserve hours totaling 708,212 for schedule risk without adequate support required by the DFARS 252.215-7002(d)(4)(iv).

Finally, we found that Bechtel did not provide supporting documents to proposal reviewers in a timely manner, including during this audit. Supporting documents for estimates should be readily available for authorized reviewers. According to Department of Energy Acquisition Regulation (DEAR) 970.5204-9, *Accounts, Records, and Inspection*,³ all books of account and records relating to this contract shall be subject to inspection and are subject to audit. We also noted that it took Bechtel several months to provide auditors supporting documents for some estimates. Further, some of the required supporting documents we requested could not be located and were not provided at all. For example, we requested Monte Carlo distribution information in May 2021, followed up on the request in June and July meetings, and continued to inquire about the request during weekly status meetings. Bechtel never provided the information to our auditors. During a previous performance audit completed by CohnReznick LLP, the auditors were forced to issue a denial of access letter to Bechtel, compelling a response. That letter included a list of contractor-delayed and incomplete requested items so auditors could obtain the information required to perform the audit.

³ DEAR 970.5204-9, *Accounts, Records, and Inspection* (May 2000), was in Bechtel’s WTP base contract and has never been modified to the current version.

Department Unaware of Inadequacies in the Estimating System

These weak estimating practices occurred because the Department was unaware of the inadequacies contained in Bechtel's estimating system. Despite the Department's extensive reviews of Bechtel's estimates and methodology, we found that Bechtel's estimating system does not have policies and procedures for significant estimating techniques, such as Monte Carlo, CERs, and unit rates. Further, as we examined this topic, we discovered that Bechtel's contract does not include clauses that define estimating system requirements. In addition, the Department does not have a specific DEAR⁴ contract clause related to cost estimating system requirements, nor does it mandate that a clause defining adequate cost estimating system criteria be included in contracts. The Contracting Officer explained that the DCMA had cognizance over Bechtel Systems and Infrastructure, Inc.'s business systems, including the estimating system, and evaluated it per the DFARS 252.215-7002, *Cost Estimating System Requirements*. Absent any additional contract requirements, we determined that the DFARS criteria was a good reference for Bechtel's estimating system. Contractor business systems and internal controls are the first line of defense and reduce the risk of Government payment of unallowable and unreasonable costs. Therefore, it is important to ensure business systems are approved and meet general requirements, such as the cost estimating standards described in the DFARS. According to the DFARS 252.215-7002, an acceptable estimating system should accomplish the following functions:

- Establish and adhere to policies, procedures, and practices;
- Ensure relevant personnel have the training, experience, and guidance to perform estimating tasks;
- Identify and document the sources of data and the estimating methods and rationale used in developing cost estimates;
- Provide for detection and timely correction of errors;
- Provide for the use of historical experience;
- Require the use of appropriate analytical methods; and
- Provide for comparisons of projected results to actual results, including an analysis of any differences.

⁴ In 2014, the Department considered requiring the inclusion of five mandatory clauses in Department contracts, including *Cost Estimating System Requirements*, which contained similar requirements that were in the DFARS. The objective of adding the clauses was to give the Department the ability to rely on information produced by the contractor's business systems during contract performance. However, in 2016, the Department withdrew the proposed change and did not mandate the inclusion of these clauses, but instead made it as an optional inclusion into new contracts.

The Department relied upon the DCMA's 2015 estimating system approval despite the system not being fully audited since 2006. In addition, DEAR 915.404-2-70, *Audit as an Aid in Proposal Analysis*, requires a review by the cognizant Federal auditor prior to the negotiation of any contract modification over \$1.5 million. However, the Department waived this audit requirement for part of the proposal valued at nearly \$393 million. Although DEAR allows a waiver from audit, Bechtel's proposal (i.e., the Direct Feed Low Activity Waste Procurement and Construction Proposal) had enough risk factors (i.e., the proposal's large dollar amount and the lack of recent system reviews) to warrant an audit. Compounding these problems, the Department did not conduct oversight sufficiently to identify whether Bechtel had established policies or procedures in place for developing many of its estimates.

We also attributed estimating system issues to the Department's inadequate review of the proposal to identify various errors. Specifically, the Department requested independent audits and reviews that did not always adequately evaluate the proposal. While the Department requested multiple reviews of the proposal, we found examples where reviewers did not evaluate the documentation upon which estimates were based. Our analysis revealed that many of the reviews provided to us by the Department did not adequately evaluate the information used to develop distributions used in Bechtel's Monte Carlo simulation or the details behind how Bechtel's Monte Carlo system works. The audits also did not review the methodology used by Bechtel to develop, test, and monitor its CERs, nor did they test for multiple unit rates for a given item or request unit rate calculations. We interviewed the proposal reviewers and found that they did not utilize fundamental techniques such as tracing data back to source documents. Some of the reviewers stated that this information was reviewed by a KPMG LLP audit. However, we noted the KPMG LLP audit specifically stated that its scope excluded an evaluation of proposed labor hours, which should have alerted reviewers that this area required additional due diligence.

Finally, the Department did not ensure that Bechtel retained documents supporting Bechtel's proposal estimates in accordance with DEAR 970.5204-9, as contained in the Bechtel contract. Similarly, we found external and internal reviewers of Bechtel's proposal also requested documentation that was either provided months late or not at all, even though Bechtel had referenced such documents as supporting its estimates.

INABILITY TO RECONCILE MANAGEMENT RESERVE TO RISK

We found that Bechtel was unable to reconcile management reserve amounts to identified risks and demonstrate how estimates tied to the Risk Management Plan, which led to unreasonable cost proposal estimates for BCP 02 and contract modification 384. Management reserve is a project management tool which allows the contractor to manage risks and uncertainties. A May 2010 Department memorandum, *EM Protocol for the Application of Contingency and Management Reserve*, outlines the treatment of management reserve. It states that "the amount of management reserve should correlate with the quantification of uncertainties and risks identified by the contractor in their Risk Management Plan." The contractor should be able to trace quantified risks to established management reserve amounts so that risks can be adequately monitored during contract performance. The memorandum further explains that management reserve should be identified by the contractor after risks are identified. The risks are then

evaluated for threats and opportunities. Though Bechtel stated it incorporated “opportunities” (a risk with a positive consequence) into its proposal, Bechtel was unable to demonstrate how opportunities were incorporated. In addition, *EM Protocol for the Application of Contingency and Management Reserve* outlines the requirement to identify and adjust estimates for risk opportunities.

This occurred because Bechtel did not establish policies, procedures, and practices that ensure compliance with the Department’s Office of Environmental Management protocol on risk management. Even though the Department’s guidance clearly laid out the appropriate process, Bechtel did not have the policies and procedures in place to follow it. The Department did not conduct oversight in a timely manner to confirm that Bechtel complied with the Office of Environmental Management protocol.

MONTE CARLO INCREASED COSTS

Bechtel utilized the Monte Carlo simulation in a manner that consistently resulted in increased hours and cost proposal estimates for BCP 02 and contract modification 384. Specifically, Bechtel applied Monte Carlo to every individual line item within its proposal as opposed to industry standard best practice application at an aggregate or summary level. Bechtel’s method has a compounding effect that would put additional hours on the proposal. Although an external independent review determined that the proposed management reserve was insufficient because of other findings in its review, it also stated that Bechtel’s “cost risk analysis uses a non-standard methodology to calculate cost reserves that overstates what would be predicted from an aggregate Monte Carlo analysis.” Additionally, the Department’s cost and technical analysis confirmed Bechtel’s use of Monte Carlo increased each estimate by 3.4 percent to 47.1 percent.

The increased hours and costs occurred because the Department did not ensure Bechtel’s methods were consistent with industry standards or best practices. *EM Protocol for the Application of Contingency and Management Reserve* states that cost uncertainty is usually performed at the summary level. According to an external independent review observation, calculating cost uncertainty at the individual level is not a standard Monte Carlo methodology. However, the Department allowed Bechtel to submit its proposal utilizing this non-standard estimating methodology.

OTHER MATTERS – MAJOR COST ELEMENT

The Department inadequately documented its negotiation on Bechtel’s proposal by not identifying the negotiated amount by cost element in its post-price negotiation memorandum. The lack of transparency on what cost elements, such as labor, were negotiated between Bechtel and the Department makes it difficult to perform a subsequent Truth in Negotiations Audit (defective pricing audit) and recover any fee that may have been negotiated using defective pricing data. The Department did not comply with FAR 15.406-3(a)(7), *Documenting the negotiation*, which states that “where the determination of a fair and reasonable price is based on cost analysis, the summary shall address each major cost element.” To prove that a contract was defectively priced, the Department is required to provide evidence that the Government relied on

defective pricing data when negotiating with the contractor. The lack of detail contained in the post-price negotiation memorandum makes it difficult for the Government to provide evidence that it relied on defective pricing data provided by the contractor.

This occurred because the Department did not follow the Department of Energy Acquisition Guide designed to ensure compliance with FAR. Specifically, we were informed that Department personnel considered that they had adequately documented the negotiation and were unaware of the FAR requirement. However, the template for price negotiation memoranda in the Department of Energy Acquisition Guide does not provide an exception to documenting by cost element or provide an exception to FAR. In addition, we reviewed other price negotiation memoranda at the Department, and they were documented by major cost element.

EFFECT OF UNREASONABLE COST PROPOSAL ESTIMATES

The contract was negotiated using consistently unreasonable estimates resulting in a risk that there were increased contract costs to the Department and, ultimately, U.S. taxpayers. Additionally, the issues identified are indications of an inadequate estimating system and, consequently, could impact every estimate Bechtel makes (e.g., request for equitable adjustments, proposals) on this project. The proposals reviewed in this audit identified over 3 million hours, at least \$124,170,000 of unreasonable CERs, and over 1 million direct labor hours added through Bechtel's application of Monte Carlo. In addition, according to a River Protection review, Monte Carlo simulation was also used to add 13.9 percent more subcontracts, 9 percent more other direct costs, 11.7 percent more bulk materials, and 11.8 percent more equipment to the proposal, all contributing to a higher negotiated project cost. Although we were able to identify an additional 830,365 (708,212+122,153) unreasonable labor hours, we were unable to quantify the impact of unit rates and some other issues identified due to the contractor's inability to provide adequate supporting documentation.

In addition to impacting all estimates completed by Bechtel, we anticipate billions of dollars in proposals to complete the High-Level Waste, Pretreatment Facilities, and the rest of the WTP. Left unresolved, the issues identified in this report could result in unsupported higher contract costs to the American taxpayer as a consequence of negotiations for current and future proposals. The taxpayer may currently be facing these consequences. As of August 2022, the Department has received two current proposals at over \$700 million in costs that may include the identified inadequacies. The Department was expecting a third Bechtel proposal before the end of 2022 that, when combined with the first two proposals, could total more than \$1 billion in costs.

RECOMMENDATIONS

We recommend that the Manager, River Protection, direct the Department Contracting Officers to:

1. Ensure all Hanford Site contractors have an adequate estimating system, including:
 - Establish specific local policies and procedures that address estimating techniques such as Monte Carlo, CERs, and unit rate development.

- Require personnel to have sufficient training, experience, and guidance with regards to the contractor's established estimating procedures.
 - Identify and document the sources of data and the estimating methods and rationale used in developing cost estimates. (Verify that contractors submit proposals that allow for detection and correction of errors in a timely manner.)
 - Ensure proposals document and utilize historical experience to the extent possible in the development of its estimates.
 - Implement a formal process to select the most reasonable CER cost drivers through a process that documents, tests, and monitors its CERs so the most appropriate CERs are developed.
 - Compare projected results to actual results including an analysis of any differences.
2. Determine whether Bechtel is compliant with CAS 401, *Consistency in Estimating, Accumulating and Reporting Costs*.
 3. Ensure that requested independent audits and reviews adequately assess data reliability and estimate accuracy through the request and review of sufficient source documentation.
 4. Require Bechtel to comply with DEAR 970.5204-9, *Accounts, Records, and Inspection*, in accordance with contract clause I.112, and provide auditor requested information in a timely manner.
 5. Ensure contractors follow the *EM Protocol for the Application of Contingency and Management Reserve*.
 6. Ensure that contract files contain summaries by major cost element when a cost analysis is required, per FAR 15.406-3(a)(7).
 7. Include the requirement for an adequate estimating system and associated estimating system criteria (see Appendix 4, *Estimating System Criteria*, for suggestion) in Bechtel's contract as part of any future modification negotiations.

We also recommend that the Director, Office of Acquisition Management:

8. Develop a policy that prescribes cost estimating system requirements, similar to those in Appendix 4, *Estimating System Criteria*, for inclusion in Department contracts.

CONSOLIDATED MANAGEMENT RESPONSE AND AUDITOR COMMENTS

River Protection concurred with three recommendations and nonconcurred with four recommendations. However, management's actions were generally not responsive to our recommendations as not all our report issues were addressed, and some of management's

proposed actions and actions already taken contradicted its own responses. The Office of Management partially concurred with Recommendation 8. Despite our efforts to discuss the report, verify information, and clarify requirements, River Protection nonconcurred with four of the seven recommendations addressed to them and considered them closed. Therefore, we require the Office of the Chief Financial Officer to maintain these recommendations in an “open” status and commence the management decision process specified in Order 224.3A.

With respect to Recommendation 8, the Office of Management provided a nonconforming response; however, the action it plans to take is responsive to our recommendation. Therefore, Recommendation 8 shall remain open until corrective action is complete, but no management decision is required.

Below is a summary of the recommendations, management’s response to each recommendation, and the auditor’s comments to each of the responses.

Recommendation 1: Ensure all Hanford Site contractors have an adequate estimating system.

- **Management Response: Nonconcur.** River Protection stated that it requires all its contractors to have an adequate estimating system and utilize it to develop and submit contract proposals that are compliant with FAR. According to River Protection, it will continue to use the DCMA to make the determination of the adequacy of the Bechtel estimating system. On June 1, 2023, the DCMA determined that Bechtel’s cost estimating system “is acceptable in accordance with the terms and conditions of DFARS 252.215-7002 and is approved.” Further, River Protection stated that it does not concur with the OIG’s recommendations that the Department establish “specific local policies and procedures” to address certain estimating techniques that would expand on or augment the requirements in DFARS 252.215-7002. River Protection considers this recommendation closed.
- **Auditor Comments:** As noted on page 7 of our report, Bechtel’s contract does not include clauses that define estimating system requirements. We continue to recommend that River Protection require all Hanford Site contractors, including Bechtel, to have an adequate estimating system, particularly for local estimating practices that Bechtel uses on the WTP project (e.g., unit rates, CERs, Monte Carlo). According to a 2014 Department Project Management Workshop presentation on Business System Clauses, Department officials stated that contractor business systems and internal controls are the first line of defense and reduce the risk of Government payment of unallowable and unreasonable costs. Because the proposal evaluated in our audit predates the 2023 DCMA determination, we cannot validate or verify the Department’s assertions. In addition, a DCMA official stated that if Bechtel implemented local policies and procedures, they would not conflict with the DCMA approved system, but rather it would be an improvement. Therefore, we continue to stand by Recommendation 1 and require the Chief Financial Officer to commence the management decision process.

Recommendation 2: Determine whether Bechtel is compliant with CAS 401, *Consistency in Estimating, Accumulating and Reporting Costs*.

- **Management Response: Concur.** According to River Protection, the DCMA is the Cognizant Federal Agency (per FAR 42.003, *Cognizant Federal Agency*) for Bechtel and has responsibility for determining CAS compliance. River Protection also stated that from 2014 through 2016, the DCAA determined that Bechtel was CAS 401 compliant. River Protection stated that as a supplemental action to validate current performance, it will request that the DCMA obtain a current DCAA CAS 401 compliance audit and update its CAS 401 determination. River Protection estimates completing this task by March 31, 2025.
- **Auditor Comments:** Management's proposed actions were responsive to our recommendation. We consider Recommendation 2 open until management's review is completed.

Recommendation 3: Ensure that requested independent audits and reviews adequately assess data reliability and estimate accuracy through the request and review of sufficient source documentation.

- **Management Response: Concur.** River Protection stated that Bechtel currently provides extensive back-up documentation for each of its contract proposals and that River Protection considers estimate accuracy and data reliability as part of its review, comment, and negotiations to establish sufficient source documentation to support the final contract change approval. On July 12, 2023, the Department held a workshop with Bechtel to gain alignment on the supporting documentation provided in proposals to support data reliability and estimate accuracy. River Protection considers this recommendation closed.
- **Auditor Comments:** We agree that Bechtel provided extensive documentation for each of its estimates; however, as stated in our report on page 6, we were unable to identify how Bechtel developed and calculated specific numbers included in the estimates. Although Bechtel provided a voluminous amount of documentation throughout our audit, the quantity of data provided does not equal the quality required to support proposal estimates according to FAR. However, management's proposed actions were responsive to our recommendation. We consider Recommendation 3 closed.

Recommendation 4: Require Bechtel to comply with DEAR 970.5204-9, *Accounts, Records, and Inspection*, in accordance with contract clause I.112, and provide auditor requested information in a timely manner.

- **Management Response: Concur.** According to River Protection, it will continue to require Bechtel to comply with all contract clauses, including clause I.112, DEAR 970.5204-9, *Accounts, Records, and Inspection* (May 2000). Going forward, River Protection and its external auditors will continue the practice of assigning due dates for information requested from Bechtel and hold Bechtel accountable. On June 21, 2023, the

Department issued a Request for Proposal for the next major WTP contract modification that included the following requirement: “Following delivery of the proposal, [Bechtel] responses to formal requests for information or additional documentation from [the Department] or external reviewers shall be provided within 5 business days unless otherwise specified or negotiated.” River Protection considers this recommendation closed.

- Auditor Comments: Management’s proposed actions were responsive to our recommendation. We consider Recommendation 4 closed.

Recommendation 5: Ensure contractors follow the *EM Protocol for the Application of Contingency and Management Reserve*.

- Management Response: **Nonconcur.** River Protection stated that the *EM Protocol for Application of Contingency and Management Reserve for the Acquisition of Capital Asset Projects* (April 2010) is not a contractor requirements document and is thus not appropriate to include as an applicable contract directive. In addition, River Protection explained that the contract required Bechtel’s Earned Value Management System (EVMS) be compliant with EIA-748 standard for EVMS. EIA-748 establishes standardized guidelines for EVMS including management reserve. River Protection continued to assert that it properly followed the protocols for establishment and management of contractor management reserve and contingency. River Protection considers this recommendation closed.
- Auditor Comments: As noted on page 8 of our report, Bechtel did not follow the guidance in its proposal estimates even though it stated it had. The Department’s response related to the contractor’s EVMS system are not related to adequate FAR estimates. The contractor stated it followed EM’s guidance for management reserve, a form of contingency. We stand by Recommendation 5 and require the Chief Financial Officer to commence the management decision process.

Recommendation 6: Ensure that contract files contain summaries by major cost element when a cost analysis is required, per FAR 15.406-3(a)(7).

- Management Response: **Nonconcur.** According to River Protection, the Contracting Officer appropriately detailed the basis for the final negotiated amount in the Price Negotiation Memorandum for Contract Modification 384, in accordance with FAR 15.406(3), *Documenting the Negotiation*. River Protection further stipulated that FAR 15.405(a), *Price Negotiation*, does not require the final price agreement be reached on every element of cost. Furthermore, River Protection explained that the Pre-Negotiation Memorandum provides tables of Bechtel’s proposed values and the Department’s negotiating objectives by major cost element to include Labor, Other Direct Costs, Subcontracts, and Materials. Lastly, River Protection stated that all negotiation documents and supporting documentation for Modification 384 were reviewed and approved by the Department Senior Procurement Executive. River Protection considers this recommendation closed.

- Auditor Comments: FAR 15.405(a), *Price Negotiation*, which River Protection cited, is for negotiations based on price analysis (when cost or pricing data is not required). However, Bechtel was required to provide cost or pricing data, and River Protection performed a cost analysis. FAR 15.406-3(a)(7), *Documenting the Negotiation*, requires that when the determination of a fair and reasonable price is based on cost analysis, every cost element be addressed in the negotiation summary. The Pre-Negotiation Plan, which contained cost elements, was developed before the negotiation; therefore, it did not address the summary of negotiations. The Price Negotiation Memorandum, developed after negotiations, did not contain Labor, Other Direct Costs, Subcontracts, and Materials, and, therefore, did not clearly articulate the information relied on in negotiations. As stated on page 9 of the report, this information is required to protect the Government's interests by enabling remedies if defective pricing data was relied on in negotiations. We continue to recommend that River Protection ensure that contract files contain summaries by major cost element when a cost analysis is required, per FAR 15.406-3(a)(7). The Department has not demonstrated that it has changed its practices to documenting all negotiations that require cost or pricing data by cost element or that it would be able to pursue defective pricing without this information, as required by FAR 15.406-3(a)(7). Therefore, we continue to stand by Recommendation 6 and require the Chief Financial Officer to commence the management decision process.

Recommendation 7: Include the requirement for an adequate estimating system and associated estimating system criteria (see Appendix 4, *Estimating System Criteria*, for suggestion) in Bechtel's contract as part of any future modification negotiations.

- Management Response: **Nonconcur.** River Protection stated that the WTP contract includes requirements for a contractor to maintain an adequate estimating system and collect costs consistently in support of normal contractor operations and contract modifications. River Protection listed various clauses as examples of requirements contained in the WTP contract. River Protection explained that it is not the cognizant contracting officer responsible for Bechtel's estimating system and relies on the DCMA to determine system adequacy. River Protection considers this recommendation closed.
- Auditor Comments: We found River Protection to be unresponsive to our recommendation because the FAR clauses listed as examples do not provide a requirement for an adequate estimating system and are not a substitute for estimating system requirements. As noted on page 7 of our report, Bechtel's contract does not include clauses that define estimating system requirements. A December 2020 U.S. Civilian Board of Contract Appeals decision states that "the difficulty for [the Department] is that none of the contract language quite says what [the Department] wishes it said." The decision also quotes *Sigal Construction Corp. v. General Services Administration*, United States Civilian Board of Contract Appeals 508, 10-1 BCA 34,442, which states that "we must interpret [...] as it is written, not as one party wishes in retrospect that it should have been written." Similarly, River Protection's FAR references do not substitute for actual criteria being included in the contract. Instead, they act as a remedy for actual estimates because of a lack of an adequate estimating system. Therefore, we continue to recommend that River Protection include the

requirement for an adequate estimating system and associated estimating system criteria (see Appendix 4, *Estimating System Criteria*, for suggestion) in Bechtel's contract as part of any future modification negotiations. Additionally, we continue to stand by Recommendation 7 and require the Chief Financial Officer to commence the management decision process.

Recommendation 8: Develop a policy that prescribes cost estimating system requirements, similar to those in Appendix 4, *Estimating System Criteria*, for inclusion in Department contracts.

- Management Response: The Office of Management stated that the Director, Office of Acquisition Management, will issue guidance to Contracting Offices that describes the value to the Department of its contractors creating and maintaining strong cost estimating systems, the requirements such systems would meet, and the need to ensure contractors meet the requirements.
- Auditor Comments: The Office of Management's comments and proposed actions are responsive to our recommendation.

Management comments are included in Appendix 3.

Appendix 1: Objective, Scope, and Methodology

OBJECTIVE

We initiated this audit to determine whether Bechtel National, Inc. (Bechtel) utilized reasonable cost proposal estimates for baseline change proposal 02 and its contract modification 384 counterpart.

SCOPE

The audit was performed from May 2021 through May 2022 in Richland, Washington. Audit scope included Bechtel's cost proposal estimating methods from February 2014 through December 2016. The audit was conducted under Office of Inspector General project number A20RL025.

METHODOLOGY

To accomplish our audit objective, we:

- Obtained and reviewed the cost proposal(s) for baseline change proposal 02 (and its contract modification 384 counterpart) to determine if reasonable estimates were used in estimating labor hours (e.g., craft, nonmanual, quantity unit rate report rate (QURR) hours, Monte Carlo, and cost estimating relationships).
- Reviewed applicable policies, procedures, laws, and regulations pertaining to Bechtel's cost proposal estimating.
- Reviewed reports issued by the Office of Inspector General, Government Accountability Office, and other entities, such as external audit firms.
- Interviewed key personnel from Bechtel, Office of River Protection, and the Department of Energy's Office of Environmental Management.
- Evaluated Bechtel's estimating practices to determine reasonableness of applicability.
- Obtained and assessed Bechtel Quality Development Packages to determine if estimates were reasonably prepared. We reviewed all Quality Development Packages from the proposal that included labor hours totaling 21,544,114 hours to assess whether Quality Development Packages were compliant with contract, procedural, and regulatory requirements. Because the selection was based on a nonstatistical sample, results and overall conclusions are limited to the items tested and cannot be projected to the entire population or universe of costs.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. We assessed internal controls and

Appendix 1: Objective, Scope, and Methodology

compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed the control activities components as well as the underlying principles implementation of control activities and design activities for information systems. However, because our review was limited to this internal control component and underlying principles, it may not have disclosed all internal control deficiencies that may have existed at the time of this audit.

To assess the reliability of the QURR needed to support proposed unit rates for labor hour estimates, we attempted to review the supporting data to the QURR. The results of our review found that the contractor did not retain any data supporting the quantity of commodities that feed into the QURR. Therefore, we determined the QURR data was not sufficiently reliable for the purposes of this report. Because the data reviewed was integral to the audit objective, this report contains recommendations to improve the reliability of the data that management relies on. Although the QURR is not sufficiently reliable, we used some of its data to answer the audit objective but not as a method of quantifying any labor hours or costs.

We held an exit conference with management officials on March 30, 2023.

Appendix 2: Prior Reports

Office of Inspector General

- Audit Report on [*Bechtel National, Inc.'s Subcontract Audit Program*](#) (DOE-OIG-20-06, November 2019). The audit found that Bechtel National, Inc. (Bechtel) had not fulfilled the requirement to audit subcontractor costs (flexibly-priced subcontracts) within its contract due to weaknesses in Bechtel's administration of its subcontract audit program as well as deficiencies in the Department of Energy's oversight. Specifically, since the start of its contract in December 2000, Bechtel had only ensured that audits had been conducted on 23 out of 110 flexibly-priced subcontracts that had received over \$1 million in funds. Further, when the Office of Inspector General reviewed the total number of years of performance for these 110 subcontracts, it was found that only 102 out of 641 (16 percent) of the years of performance had been audited. Additionally, many of the completed audits had not been effective or reliable. Bechtel's long-standing noncompliance with subcontract auditing requirements persisted, in part, because the Department had not always provided proactive oversight of Bechtel's subcontract audit program in a timely manner.

Government Accountability Office

- Audit Report on [*Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability*](#) (GAO-19-28, January 2019). The Department's Office of Environmental Management faces an environmental liability of \$377 billion, according to the Department's fiscal year 2018 financial statements. This amount largely reflects estimates of future costs to clean up legacy radioactive tank waste and contaminated facilities and soil. The Office of Environmental Management's environmental liability increased by nearly \$130 billion from fiscal year 2014 through fiscal year 2018 at the Hanford Site in Washington State in part because of contract and project management problems with waste cleanup. The Government Accountability Office's analysis of Department documents identified instances of decisions involving billions of dollars where such an approach did not always balance overall risks and costs. For example, two Office of Environmental Management sites had plans to treat similar radioactive tank waste differently, with the costs at one site, the Hanford Site, possibly exceeding tens of billions more than the other site.

Appendix 3: Management Comments



Department of Energy Hanford Site

Richland Operations Office | Office of River Protection

October 5, 2023

PSD:MAZ/23-PSD-0026

MEMORANDUM FOR EARL OMER
ASSISTANT INSPECTOR GENERAL FOR AUDITS
OFFICE OF INSPECTOR GENERAL

FROM: ROBERT M. IRWIN
ACTING ASSISTANT MANAGER
WASTE TREATMENT AND IMMOBILIZATION PLANT PROJECT

Robert M.
Irwin

Digitally signed by Robert
M. Irwin
Date: 2023.10.05
12:47:23 -07'00'

SUBJECT: UPDATED MANAGEMENT RESPONSE TO THE OFFICE OF
INSPECTOR GENERAL DRAFT AUDIT REPORT ON BECHTEL
NATIONAL, INC.'S COST PROPOSAL ESTIMATES FOR BASELINE
CHANGE PROPOSAL 02 AND ITS CONTRACT MODIFICATION 384
COUNTERPART FOR THE WASTE TREATMENT AND
IMMOBILIZATION PLANT

The U.S. Department of Energy (DOE) has reviewed the information in the Office of Inspector General's (IG) draft audit report (project number A20RL025). DOE appreciates the IG's comprehensive review of the contract and baseline proposals supporting completion of the facilities that support the direct-feed low-activity waste (DFLAW) configuration for the Waste Treatment and Immobilization Plant (WTP) Project at Hanford. While DOE acknowledges a number of the facts presented in the IG's report, there were also numerous statements in the report that omitted important factual data provided to the IG during the audit to establish additional context for the assessment process.

As a result, and while DOE does not endorse the report's conclusions that Bechtel National, Inc.'s (BNI) baseline and contract proposals were unreasonable or that BNI benefited (improperly) or disadvantaged the taxpayer, DOE will use the assessment to continue to enhance contractor oversight in general. Both the DOE Hanford Site office and DOE's external independent review teams performed extensive cost and technical reviews of BNI's DFLAW proposals prior to the negotiation and approval in 2016, and in fact concluded in those reviews that BNI's estimates understated the amount of management reserve BNI would require to complete the DFLAW segment of the project. DOE established additional contingency in its Baseline Change Proposal 02 to account for those additional risks, contingency, which has in fact been needed to address challenges encountered during DFLAW commissioning. Regardless, DOE acknowledges the IG's recommendations and has largely addressed the recommendations prior to this report being issued. DOE will continue to implement appropriate process improvements to manage its contract and baseline changes and to enhance contractor oversight in the future.

DOE's Management Response to each of the recommendations is summarized below.

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Recommendation 1:

Ensure all Hanford site contractors have an adequate estimating system, including:

- Establish specific local policies and procedures that address estimating techniques such as Monte Carlo, cost estimating relationships (CERs), and unit rate development.
- Require personnel have sufficient training, experience, and guidance with regards to the contractor's established estimating procedures.
- Identify and document the sources of data and the estimating methods and rationale used in developing cost estimates. (Verify that contractors submit proposals that allow for detection and correction of errors in a timely manner.)
- Ensure proposals document and utilize historical experience to the extent possible in the development of its estimates.
- Implement a formal process to select the most reasonable CER cost drivers through a process that documents, tests, and monitors its CERs so the most appropriate CERs are developed.
- Compare projected results to actual results including an analysis of any differences.

Management Response: Non-Concur

DOE requires all of its contractors to have an adequate estimating system and to utilize that system to develop and submit contract proposals compliant with the "Federal Acquisition Regulation." DOE will continue to use the Defense Contract Management Agency (DCMA) to make the determination of the adequacy of BNI's estimating system. DCMA issued a determination in January 2019 that "Bechtel's Estimating System continues to be acceptable and approved in accordance with the terms and conditions of DFARS 252.215-7002, 'Cost Estimating System Requirements.'" On June 1, 2023, DCMA issued its most recent determination on BNI's cost estimating system. DCMA determined BNI's cost estimating system "is acceptable in accordance with the terms and conditions of DFARS 252.215-7002 and is approved."

DOE does not concur with the IG's recommendations that DOE Hanford establish "specific local policies and procedures" to address certain estimating techniques (e.g., Monte Carlo analysis, CERs, or unit rates) that would expand on or augment the requirements in DFARS 252.215-7002, "Cost Estimating System Requirements." DOE does not support a deviation from DOE policies or practices at the site level unless those deviations are addressed and endorsed at the Department level.

Rationale:

- Estimating system attributes are already included in the "System Requirements" section of DFARS 252.215-7002.
- Establishing unique/local estimating system requirements beyond those required by the Defense Federal Acquisition Regulations Supplement would introduce potential conflicting requirements, duplicate auditing resources, and confuse lines of authority for estimating system approval determinations.
- BNI uses a common government estimating system across multiple business units (Bechtel Group, Inc.; Bechtel National Security and Environmental; and BNI). Establishing specific

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Hanford local estimating system requirements would require BNI to establish a standalone estimating system for WTP, which would increase cost to the project and the taxpayer.

This recommendation is considered closed.

Recommendation 2:

Determine whether Bechtel is compliant with Cost Accounting Standard 401, *Consistency in Estimating, Accumulating and Reporting Costs*.

Management Response: Concur

DOE concurs with this recommendation but notes that BNI has already been determined to be compliant with CAS 401. DCMA is the cognizant federal agency (per FAR 42.003, "Cognizant Federal Agency") for BNI and has responsibility for determining compliance with the cost accounting standard (CAS) compliance. Additionally, DCMA would most likely use the Defense Contract Audit Agency (DCAA) as the cognizant federal audit agency for a BNI determination of CAS 401 compliance or noncompliance. DCAA evaluated BNI CAS 401 compliance from 2014 through 2016 and opined that BNI was compliant per DCAA letter 4281/820.1/17-0032, "Cost Accounting Standard Compliance Testing," dated November 29, 2016, in accordance with FAR 42.003. FAR 30.202-6, "Responsibilities" and FAR 30.202-7, "Determinations" address responsibilities and determinations for CAS coverage, CAS compliance determinations, and CAS reviews. As a supplemental action to validate current performance, DOE will request DCMA to obtain a current DCAA CAS 401 compliance audit and request DCMA to update its CAS 401 determination.

Estimated completion date: March 31, 2025.

DCAA audit and subsequent DCMA CAS determination is contingent upon DCMA's acceptance of DOE's request since DCMA is the cognizant federal agency as noted above.

Recommendation 3:

Ensure that requested independent audits and reviews adequately assess data reliability and estimate accuracy through the request and review of sufficient source documentation.

Management Response: Concur

BNI currently provides extensive backup documentation for each of its quantity development packages (e.g., quantity basis, rates, pricing data) in its contract proposals. Estimate accuracy and data reliability are considered part of the DOE review, comment, and negotiation to establish sufficient source documentation to support the final contract change approval.

DOE has completed two actions to address this recommendation:

- On June 21, 2023, DOE issued a request for proposal (RFP) for the next major WTP contract modification for completion of the High-Level Waste (HLW) Facility design. The RFP included the following requirements:

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The design completion period proposal shall include adequate supporting documentation that provides traceability to proposed scope, quantities, and rates used to develop the proposal estimate. Estimating rates (e.g., construction or engineering unit rates) not based directly on historical data will be supported with adequate justification for the alternate rates being used in the proposal. DOE will meet with Bechtel early in the proposal development process to gain alignment on the nature and content of supporting documentation to be provided in the proposal.

- On July 12, 2023, DOE held the workshop referenced in the June 21, 2023, RFP to gain alignment on the supporting documentation to be provided in the proposal to support data reliability and estimate accuracy. The purpose of the workshop was to define source documentation requirements to support BNI's estimate for the contract modification proposal for completing the design of the HLW Facility between 2023 and 2027. The meeting was supported by senior HLW project managers from both DOE and BNI, as well as project controls and estimating managers from both organizations. Meeting minutes were captured to document agreements on the required proposal source documentation and the technical and pricing basis for estimates in the proposal.

This recommendation is considered closed although the contract modification associated with the RFP will not be complete until fiscal year 2024.

Recommendation 4:

Require Bechtel to comply with DEAR 970.5204-9, *Accounts, Records, and Inspection*, in accordance with contract clause I.112, and provide auditor requested information in a timely manner.

Management Response: Concur

DOE will continue to require BNI to comply with all contract clauses, including Contract No. DE-AC27-01RV14136, "Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant," clause I.112, "DEAR 970.5204-9, Accounts, Records, and Inspection (May 2000)." Going forward, DOE (and its external auditors) will continue the practice of assigning due dates for information requested from BNI and hold BNI accountable for providing timely responses or negotiating appropriate extensions to due dates if warranted.

To address the IG's recommendation for BNI to provide auditor requested information in a timely manner, DOE has taken the following additional action:

- On June 21, 2023, DOE issued an RFP for the next major WTP contract modification for completion of the HLW Facility design. To address the IG's issue with timeliness of BNI responses to requests for information, the RFP included the following requirement:

Following delivery of the proposal, BNI responses to formal requests for information or additional documentation from DOE or external reviewers shall be provided within five business days unless otherwise specified or negotiated. BNI

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may request additional time to provide responses from the contracting officer via email.

This recommendation is considered closed.

Recommendation 5:

Ensure contractors follow the EM *Protocol for the Application of Contingency and Management Reserve*.

Management Response: Non-Concur

The DOE Office of Environmental Management's (EM) "Protocol for Application of Contingency and Management Reserve" for the acquisition of capital asset projects (April 2010) "provides guidance for the development and consistent application of government contingency and contractor management reserve (MR) in the planning and execution of DOE capital asset projects in accordance with the requirements of DOE Order 413.3 and the Federal Acquisition Regulations (FARs)." The EM protocol memorandum is not a contractor requirements document such as those found in some (not all) DOE orders and is thus not appropriate to include as an applicable contract directive. The DOE O 413.3B, "Program and Project Management for the Acquisition of Capital Assets," contractor requirements document and Contract No. DE-AC27-01RV14136 require that the Earned Value Management System (EVMS) be compliant with EIA-748 standard for EVMS. EIA-748 establishes standardized guidelines for EVMS including management reserve.

DOE has reviewed and continues to assert that it properly followed the protocols for establishment and management of contractor management reserve and contingency in the development of Contract No. DE-AC27-01RV14136, Modification 384 and Baseline Change Proposal 02 as confirmed by both DOE internal reviews and external reviews of both the contract modification and baseline change proposal.

This recommendation is considered closed.

Recommendation 6:

Ensure that contract files contain summaries by major cost element when a cost analysis is required per FAR 15.406-3(a)(7).

Management Response: Non-Concur

FAR 15.406-3(a)(7), "Documenting the negotiation," states that the level of detail in a price negotiation memorandum is:

A summary of the contractor's proposal, any field pricing assistance recommendations, including the reasons for any pertinent variances from them, the Government's negotiation objective, and the negotiated position. Where the determination of a fair and reasonable price is based on cost analysis, the summary shall address each major cost element. When determination of a fair and reasonable price is based on price analysis, the summary shall include the source and type of data used to support the determination.

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In this case, the contracting officer appropriately detailed the basis for the final negotiated amount in the price negotiation memorandum for Contract DE-AC27-01RV14136, Modification 384, in accordance with FAR 15.406-3 and FAR 15.405(a), "Price negotiation," states, in part, that the fair and reasonable price does not require that the settled price agreement be reached on every element of cost. DOE's pre-negotiation memorandum on Modification 384, pages 16 through 32, provides tables of BNI's proposed values and the DOE negotiating objectives of the major cost elements. The table lists labor, other direct costs, subcontracts, materials, etc. All negotiation documents and supporting documentation for Modification 384 were reviewed and approved by both the head of contracting activity (lead contracting negotiator) and the DOE senior procurement executive. Local policies and "Federal Acquisition Regulations" will continue to be adhered to.

This recommendation is considered closed.

Recommendation 7:

Include the requirement for an adequate estimating system and associated estimating system criteria (see Appendix 4, *Estimating System Criteria*, for suggestion) in Bechtel's contract as part of any future modification negotiations.

Management Response: Non-Concur

Contract No. DE-AC27-01RV14136 already contains requirements for an adequate estimating system to be in place and to be used to collect costs consistently in support of normal contractor operations and contract modifications, for example:

- Clause I.13, "FAR 52.215-11 Price Reduction for Defective Cost or Pricing Data - Modifications (Oct 1997)"
- Clause I.14, "FAR 52.215-13 Subcontractor Cost or Pricing Data - Modifications (Oct 1997)"
- Clause I.19A, "FAR 52.215-20 Requirements for Cost or Pricing Data or Information Other than Cost or Pricing Data (Oct 1997)"
- Clause I.63, "FAR 52.230-2 Cost Accounting Standards (Apr 1998)"
- Clause I.64, "FAR 52.230-6 Administration of Cost Accounting Standards (Nov 1999)"
- Clause I.83, "FAR 52.243-6 Change Order Accounting (Apr 1984)."

Notwithstanding, cognizance for the Bechtel Corporate estimating system resides with the DCMA. Under Contract No. DE-AC27-01RV14136, a self-contained corporate entity was not established to execute a single contract (the WTP contract) specifically, which is common with other DOE Hanford Site prime contractors. The DCMA corporate administrative contracting officer, outlined in detail below, utilizes DFARS 252.215-7002 in conducting oversight of Bechtel Corporate's estimating system.

Bechtel Corporate has numerous federal government contracts. FAR 42.601, "General," states:

Contractors with more than one operational location (e.g., division, plant, or subsidiary) often have corporate-wide policies, procedures, and activities requiring Government review and approval and affecting the work of more than one administrative contracting officer (ACO). In these circumstances, effective and consistent contract

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administration may require the assignment of a CACO to deal with corporate management and to perform selected contract administration functions on a corporate-wide basis.

FAR 42.602 (a), "Assignment and location," states:

... In determining the location of the CACO, the responsible agency shall take into account such factors as the location(s) of the corporate records, corporate office, major plant, cognizant government auditor, and overall cost effectiveness.

In the case of BNI, DOE and DCMA agreed at the time of award that DCMA would have cognizance over Bechtel Corporate systems. A corporate administrative contracting officer designated by DCMA maintains cognizance over Bechtel Corporate's estimating system. DOE relies on DCMA to determine the adequacy of Bechtel Corporate's estimating system.

This recommendation is considered closed.

If you have any questions, please contact Marcy Aplet-Zelen, Procurement Support Division Hanford Audit Coordinator, at (509) 376-8510.

cc:

Director, Office of Financial Policy and Audit Resolution, CF-20
Audit Resolution Specialist, Office of Financial Policy and Audit Resolution, CF-20
Audit Liaison, Office of Environmental Management, EM-5.112
Audit Liaison, Richland Operations Office, RL
Audit Liaison, Office of River Protection, ORP

Appendix 3: Management Comments



Department of Energy

Washington, DC 20585

February 1, 2023

MEMORANDUM FOR JENNIFER L. QUINONES
DEPUTY INSPECTOR GENERAL
OFFICE OF THE INSPECTOR GENERAL

FROM: INGRID KOLB
DIRECTOR
OFFICE OF MANAGEMENT

Ingrid Kolb
Digitally signed by Ingrid
Kolb
Date: 2023.02.01
07:59:01 -05'00'

SUBJECT: OFFICE OF MANAGEMENT RESPONSE TO INSPECTOR
GENERAL DRAFT AUDIT REPORT ON BECHTEL
NATIONAL, INC.'S COST PROPOSAL ESTIMATES FOR
BASELINE CHANGE PROPOSAL 02 AND ITS CONTRACT
MODIFICATION 384 COUNTERPART FOR THE WASTE
TREATMENT AND IMMOBILIZATION PLANT

The Office of Management (MA) partially concurs with the Draft Audit Report's recommendation 8, which recommends the Director, Office of Acquisition Management "Develop a policy that prescribes cost estimating system requirements, similar to those in Appendix 4, Estimating System Criteria, for inclusion in Department contracts." The Director, Office of Acquisition Management will issue guidance to Contracting Offices that describes the value to the Department of its contractors' creating and maintaining strong cost estimating systems, the requirements such systems would meet, and the need to ensure contractors meet the requirements.

The cost estimating system requirements in Appendix 4, Estimating System Criteria, of the Draft Audit Report are those of the Department of Defense (DoD). They will be considered in formulating the guidance, as will the differences between DoD's contract administration and that of the Department of Energy (DOE).

While the Draft Audit Report contains many observations that may contribute to the Department's achieving its mission and continuing to be a good steward of taxpayer dollars, MA identified a few technical issues in the report. As an example, the part of the DEAR contract clause "Accounts, Records, and Inspection" that the Report alludes to applies to incurred allowable costs, not to estimated costs. Technical comments will be provided separately.

If you have any questions regarding this response, please contact Berta Schreiber, Deputy Director, Office of Acquisition Management.

Estimating System Criteria

These 17 points of criteria for an adequate estimating system mirror those included in the Defense Federal Acquisition Regulation Supplement, Department of Energy Acquisition Letter AL-2013-11, and the criteria utilized by CohnReznick LLP in the Department-procured *Performance Audit of Bechtel National, Inc.'s Estimating System under the Waste Treatment and Immobilization Plant Project as of May 15, 2017* (Performance Audit Report, No. 0207684-2370-16, September 2017). These criteria are as follows:

1. Establish clear responsibility for preparation, review, and approval of cost estimates and budgets.
2. Provide a written description of the organization and duties of the personnel responsible for preparing, reviewing, and approving cost estimates and budgets.
3. Ensure that relevant personnel have sufficient training, experience, and guidance to perform estimating and budgeting tasks in accordance with the contractor's established procedures.
4. Identify and document the sources of data and the estimating methods and rationale used in developing cost estimates and budgets.
5. Provide for adequate supervision throughout the estimating and budgeting process.
6. Provide for consistent application of estimating and budgeting techniques.
7. Provide for detection and timely correction of errors.
8. Protect against cost duplication and omissions.
9. Provide for the use of historical experience, including historical vendor pricing information, where appropriate.
10. Require use of appropriate analytical methods.
11. Integrate information available from other management systems.
12. Require management review, including verification of compliance with the company's estimating and budgeting policies, procedures, and practices.
13. Provide for internal review of, and accountability for, the acceptability of the estimating system, including the budgetary data supporting indirect cost estimates and comparisons of projected results to actual results and an analysis of any differences.

Appendix 4: Estimating System Criteria

14. Provide procedures to update cost estimates and notify the Contracting Officer in a timely manner.
15. Provide procedures that ensure subcontract prices are reasonable based on a documented review and analysis provided with the prime proposal, when practicable.
16. Provide estimating and budgeting practices that consistently generate sound proposals that are compliant with the provisions of the solicitation and are adequate to serve as a basis to reach a fair and reasonable price.
17. Have an adequate system description, including policies, procedures, and estimating and budgeting practices that comply with the Federal Acquisition Regulation and Department of Energy Acquisition Regulation.

FEEDBACK

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**Bechtel National, Inc.'s Cost Proposal Estimates for Baseline Change
Proposal 02 and Its Contract Modification 384 Counterpart for the Waste
Treatment and Immobilization Plant
DOE-OIG-23-34
Report Addendum for Identified Contractor Comments**

The U.S. Department of Energy Office of Inspector General (OIG) released a public report that refers to work performed by external parties. Pursuant to Public Law 117-263, Section 5274, non-governmental organizations and business entities specifically identified in an audit report prepared by the OIG have the opportunity to submit a written response for the purpose of clarifying or providing additional context to any specific reference. The OIG notified each external party related to this report on November 8, 2023, giving them 30 days to provide a response. The response is appended to the final, published report. The OIG reviews any response for the purpose of preventing the improper disclosure of classified or other nonpublic information, and, if necessary, will redact such information.

In response to our final report on *Bechtel National, Inc.'s Cost Proposal Estimates for Baseline Change Proposal 02 and Its Contract Modification 384 Counterpart for the Waste Treatment and Immobilization Plant*, one contractor provided written responses for the purpose of clarifying or providing additional context to specific references in the report. The contractor agreed with the Office of River Protection response to the report. The contractor stated the report did not recognize some factual issues raised in the Department's response nor in the comments the contractor provided during the course of the report's drafting and finalization.

The response from the contractor, Bechtel National, Inc. (BNI), is provided below.

BNI Response to OIG Audit Report DOE-OIG-23-34

BNI agrees with the response to the DOE-OIG-23-34 Report (“Report”) submitted by the Department of Energy, Office of River Protection (“DOE-ORP”). By way of highlight, the Report does not recognize the following factual issues raised in the DOE-ORP’s response nor in the extensive comments BNI provided during the course of the Report’s drafting and finalization:

- BNI’s Estimating System was determined adequate and approved by the Defense Contract Management Agency, the agency that is responsible for reviewing the estimating systems of various federal contractors, in February 2015, and more recently in June 2023.
- The WTP contract, including Mod. 384, is a cost-reimbursement contract, which means that DOE reimburses BNI for its actual incurred costs not based on its prior estimates.
- The Report states that BNI and DOE failed to exercise oversight and appropriate reviews and did not compare actual costs to estimated costs. BNI’s earned value management system made those comparisons and accomplished that oversight (*e.g.*, monthly reporting to DOE regarding cost and schedule variances experienced across all Control Accounts).
- BNI provided substantial information to OIG that demonstrates that the Report’s Recommendations to DOE-ORP are already part of the Project’s processes and procedures. This information includes written submissions concerning BNI’s Monte Carlo analysis, the development of unit rates, BNI’s use of cost estimating ratios (CERs), and the background and timing of the Mod. 384 process. BNI provided OIG with over 9,300 files from the estimating process and the BNI estimates were subject to nearly 2 years of thorough review by DOE.