DEPARTMENT OF THE ARMY CORPS OF ENGINEERS

COMPLETE STATEMENT

OF

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BEFORE

THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES

ON

TECHNICAL SUPPORT TO THE DEPARTMENT OF ENERGY

OFFICE OF RIVER PROTECTION FOR WASTE TREATMENT FACILITY

April 6, 2006

Mr. Chairman and distinguished members of the Subcommittee:

I am honored to be testifying before your subcommittee today on behalf of the U.S. Army Corps of Engineers, on the Department of Energy's Hanford Waste Treatment and Immobilization Plant Project. My name is Kim Callan, and I am the Corps project manager for this review effort.

U.S. ARMY CORPS OF ENGINEERS REPORT TITLED "INDEPENDENT REVIEW OF WASTE TREATMENT FACILITY ESTIMATE AT COMPLETION (EAC) 2005", DATED MAY 05.

The Department of Energy (DOE), Office of Engineering and Construction Management authorized DOE Office of River Protection (ORP) to fund the U.S. Army Corps of Engineers, Walla Walla District, to conduct an independent review of the 2005 Estimate at Completion (EAC) report for the Hanford Waste Treatment and Immobilization Plant (WTP) prepared by Bechtel National Incorporated (BNI). The objectives are to determine the accuracy and viability of the 2005 EAC report and the effectiveness of the existing management controls.

In December 2000, DOE-ORP awarded BNI a contract to design, construct, and commission the WTP using a design-build approach under a cost-plus-incentive fee contract. Since project inception, cost and schedule have continued to increase. On January 7, 2005, DOE requested BNI to prepare a high confidence level estimate at completion, using historical information and a defensible and credible construction schedule using two strategies: Scenario A – unconstrained funding and Scenario B –

Description	EAC 2005 Estimated Amount (Scenario A)
	$M
To-Date as of Dec 2004	5,040
Increases in EAC from 2004 review	
Non-Newtonian Mixing	190
Hydrogen in Piping and Ancillary Vessels	90
Design Evolution	459
Revised Ground Motion	753
Fireproofing of Structural Steel	68
Performance Related Changes	150
Pricing Related Changes (95M in misc)	125
Misc. Other Adjustments	136
S/T Increases	1,971
Contingency	700
2005 EAC Total	**7,711**
Technical and Programmatic Risk Assessment (TPRA)	79
Fee	225
Transition	50
Total Project Cost	**8,065**

constrained funding of $690 million per year.

The independent review (IR) team reviewed the 2005 EAC between March 14, 2005, and April 30, 2005. An initial draft 2005 EAC was received on April 4, 2005, and the final 2005 EAC was received on April 22, 2005. The IR team approach was to evaluate procedures and methods used for developing the 2005 EAC cost and schedule. Due to the magnitude of data, along with the short suspense, the IR team focused on high-impact, high-cost areas. The IR team reviewed over 260 documents, interviewed representatives from DOE-ORP and BNI, and took part in numerous briefings on technical and/or programmatic subjects.

The 2005 EAC shows the estimated total cost of each scenario is significantly higher than the March 2003 total cost of $5.78 billion, and the estimated completion date has extended beyond July 2011. The IR team's development of WTP cost, as shown in table 1.1, and BNI's scheduled contract completion dates for each scenario are as follows:

Scenario A – WTP total project cost equals $8.065 billion, schedule complete date March 17, 2014.

Scenario B – WTP total project cost equals $8.348 billion, schedule complete date July 2015.

Note: Tri-Party Agreement milestone for completion of hot commissioning is currently set at January 31, 2011.

The majority of cost increase and schedule slippage was due to technical issues, such as: non-newtonian mixing; hydrogen in piping and ancillary vessels; revised ground motion (change to seismic criteria); and fireproofing of structural steel. Other increases were due to design evolution, BNI contractor performance related changes, and commodity and plant equipment pricing increases. The following are three examples of significant increases in this EAC:

The overall increase was 3,548,000 in engineering labor hours from the December 2004 Trended Performance Measurement Baseline (PMB) to the 2005 EAC.

The construction cost, as defined by the EAC, which includes non-manual and manual labor and portion of other construction direct cost, has increased 60 percent ($895 million) since the December 2004 Trended PMB, for a net change from $1,483 to $2,378 million.

The key commodity – concrete embeds, increased from 5 million pounds in the December 2004 Trended PMB to 10 million pounds in the 2005 EAC.

The scope of this review did not include validating the processes used in the "Site-Specific Seismic Site Response Model for the Waste Treatment Plant, Hanford, Washington" or the resulting recommended revisions to the response spectra that form the basis of the Revised Ground Motion (RGM).

KEY FINDINGS/OBSERVATIONS

Several potential high cost impact and schedule issues (mainly seismic-related issues and Scenario B Schedule) are not at an adequate level of detail to validate this 2005 EAC cost and schedule. Given the conservatisms built into the seismic-related estimates and schedule, the 2005 EAC cost appears to be a bounding[1] estimate.

There is a concern, however, that the 2005 EAC has not fully estimated potential cost growth. This project requires aggressive management by DOE and BNI, sufficient annual funding, and contract incentives to control cost and schedule growth.

The IR team considered programmatic issues that may arise outside of DOE's immediate control [e.g., RGM]. The IR team's independent assessment of DOE's Programmatic Risk identified $1.3 billion (at the 80 percent confidence level) in addition to the forecasted total project cost. This $1.3 billion should not necessarily be included in the proposed Total Project Cost for the WTP Project, but DOE-ORP, DOE Headquarters, and Congress should be aware that potential cost and schedule risks remain beyond those already captured by the BNI 2005 EAC.

Management Controls, Contract Incentive, and Risk

Both DOE and BNI will need to be more proactive in their management approach to determining revised ground motion for the WTP.

For example: DOE and BNI limited their challenge of the Defense Nuclear Facilities Safety Board (DNFSB) RGM position. It appears that both DOE and BNI, in responding to the increased seismic requirements could have responded to DNFSB by conducting a parallel, non-critical path analysis. The design was already conservative, and if seismic threats exist, it is imperative the project be accelerated to empty tanks as soon as possible (tanks and their contents represent the immediate risk in a seismic event), rather than further delay and increase the cost of the project to do more analysis at this time.

Continued cost growth, extended schedule completion dates, and the on-going performance trends exhibited on this project indicate the acquisition and contract strategy is not working as originally envisioned.

The current contract does not provide sufficient incentive for BNI to control cost and schedule.

The complexity of this project is extremely high. Excellent communication and aggressive management are key drivers for the cost and schedule control of this project. Improvements need to be made to improve BNI performance measures.

Potentially significant cost and schedule risks remain beyond those already captured in the 2005 EAC. Potential cost and schedule growth may include:

[1] Bounding – cost falls within the upper limit.

escalation, technical developments, commissioning, and programmatic and regulatory issues.

The IR team believes that it is appropriate to use project escalation rates that reflect current market trends rather than using DOE 2004 rates in calculating escalation at the WTP. The 2005 EAC has been developed using the escalation rate forecasts published by DOE in January 2004. These rates are not reflective of the excessive and abnormal impacts on construction costs experienced in 2004 as construction material prices increased at levels unseen in recent years. Price escalation and rising energy prices have caused a ripple effect on many construction commodities and plant equipment and is not captured by the DOE rates.

DOE-ORP must closely monitor future provisional fee payments; fees paid to date may be approaching the amount BNI may actually earn.

DOE-ORP has made several improvements in its management role for providing oversight on this cost plus contract. DOE needs to ensure sufficient DOE-ORP staff to manage this contract; especially, contract administration of the directed RGM change in accordance with Federal Acquisition Regulations in a timely manner.

DOE-ORP has managed BNI requests for scope change since the 2004 U.S. Army Corps of Engineers review.

For Example: The HYDROGEN IN PIPING AND ANCILLARY VESSELS issue was included in the 2005 EAC by BNI as a technical issue for which the BNI is seeking a contract scope change. BNI states in a letter to DOE-ORP dated February 17, 2005, that they "… have determined that impacts related to unanticipated efforts required to mitigate hydrogen in the WTP are covered under Contract Clause B.10 Fee Risk Allocation. As such, we are reserving our rights to an equitable adjustment for those impacts." However, as with the Pulse Jet Mixers, DOE-ORP does not believe that this issue is a contract scope change, and in a letter dated April 1, 2005, denied the equitable adjustment.

Schedule Development

Scenarios A and B schedules are not sufficiently developed to provide an adequate analysis.

- Scenario A schedule has a high number of constraints (over 1,400), which extended the project length. When asked about aggressive scheduling options for the EAC, BNI indicated that they had not been tasked with analyzing varying schedule methods. By reducing the excess float, a savings of nearly $300 million could possibly be achieved by correcting or modifying the schedule logic.

- Scenario B schedule, which is the “most likely” funding scenario, was a graphical representation of a schedule. The IR team did not receive an acceptable schedule for Scenario B.

The 2005 EAC narrative on “Major Changes from December 2004 Trended PMB” referenced time-related cost impacts. The referenced calculation of cost impacts could not be verified.

2005 EAC Cost Development

The estimating methods used to develop the 2005 EAC cost appear consistent with standard estimating procedures. Tracking cost from a review standpoint is difficult due to the complexity of the cost and accounting system used by BNI.

The IR team found that the 2005 EAC submitted by BNI was not a Class 2 estimate. BNI stated this 2005 EAC is a Class 2 estimate, which incorporates detailed engineering design, site productivity, labor wage rate, escalation, fee, and other factors that influence the job cost. However, the seismic-related estimates of over $750 million are not considered Class 2 estimates. The 2005 EAC specifically identified over $86 million of various rough order of magnitude estimates and a small amount of non-seismic-related estimates, which are not considered Class 2.

CURRENT 2006 U.S. ARMY CORPS OF ENGINEERS SUPPORT AT WASTE TREATMENT FACILITY

Based on the Corps 2005 review, the Department of Energy, Office of Environmental Management has requested the U.S. Army Corps of Engineers to conduct additional independent reviews of the Hanford Waste Treatment and Immobilization Plant project for the following: 1) development and implementation of the revised seismic design criteria, 2) activities to gather additional geophysical data to confirm the revised seismic design criteria, and 3) validate the updated 2005 Estimate At Completion.

Task 1: Through independent analysis determine the basis for the revision to the seismic design criteria.

Phase 1: The U.S. Army Corps of Engineers will provide a review of the ORP plan to perform additional deep borings at WTP. The current ORP proposal of five new bore holes drilled down 1,500 linear feet will be evaluated. U.S. Army Corps of Engineers experts in geotechnical investigations will provide independent comments to DOE on this course of action which is meant to augment the seismic information gathered to date. In order to perform this review, site-specific ground motion data previously collected at the Hanford Site will be examined by the independent U.S. Army Corps of Engineers review team.

Phase 2: The U.S. Army Corps of Engineers will conduct a review of the scope, schedule and cost for the Department of Energy subcontractor to drill up to five boreholes and conduct the seismic analysis. The U.S. Army Corps of Engineers will provide independent recommendations on the scope, schedule and cost effectiveness of this approach.

Phase 3: The U.S. Army Corps of Engineers will have personnel in the field as the drilling is accomplished and work with Department of Energy subcontractor if refinements of the drilling activities are necessary.

Phase 4: Upon completion of the actual drilling, the U.S. Army Corps of Engineers and their nationally recognized technical experts will evaluate the data collected by the drilling contractor. Independent recommendations on the use of the collected data will be provided to DOE.

Phase 5: The U.S. Army Corps of Engineers will accomplish the ground motion experiments. After analyzing that data the U.S. Army Corps of Engineers will consider any modifications to the seismic design criteria.

Phase 6: Using the data derived from the seismic experiments the U.S. Army Corps of Engineers and their technical experts will evaluate and determine if this new data would materially change the seismic design criteria currently in place. The U.S. Army Corps of Engineers and their experts (along with ORP and BNI) will discuss these results with DNFSB.

Task 2: Provide assistance to the Department of Energy for design reviews of ongoing design activities against current seismic design criteria to assure code compliance is being addressed, while cost and schedule impacts are being minimized.

Phase 1: Using nationally recognized experts, review the previous reports which served as the basis for the revision to the seismic design criteria. The previous reports were in response to the concerns expressed by DNFSB. Determine the overall margin of conservatism and the likelihood the criteria bounds the expected results from the gathering of additional geophysical data. The U.S. Army Corps of Engineers will prepare a Phase 1 report that summarizes these findings and determinations.

Phase 2: The U.S. Army Corps of Engineers will support DOE in the assurance of quality for the progression of BNI structural analysis and design, as revised and modified in Seismic Design Criteria Revision 10. The U.S. Army Corps of Engineers external IR will assure that the design complies with the code requirements, ensuring the safety of WTP structures, systems and components, and at the same time, maintaining efficient design practices to minimize the impact to the cost and schedule of the project. The U.S. Army Corps of Engineers independent review will ensure that the BNI seismic re-design processes are performed in an effective manner.

The objective of these independent oversight reviews of the BNI re-analysis and design is to determine that designs are code-compliant ensuring the safety of WTP, and at the same time an appropriate level of design is performed that minimizes the impact to the project without adding undue layers of conservatism. This will be accomplished through a review of the design procedures used by BNI engineers. In addition, the U.S. Army Corps of Engineers will perform a review of selected specifications, design criteria, drawings and calculations which represent the structural designs of WTP structures, systems and components.

The review team will identify, where possible, key analytical and/or design assumptions and discuss their validity. The team will recommend changes where prudent to reduce project risk or significant over-design.

Task 3: Conduct an independent validation[2] of the 2006 Estimate at Completion. Completion Date: July 2006

This review is a follow-on study subsequent to the U.S. Army Corps of Engineers May 13, 2005 report of the April 2005 Estimate at Completion. The basis for this independent validation review began with a Waste Treatment Facility 2005 Estimate at Completion dated September 30, 2005 for three of the five facilities.

Based on recommendations within the May 2005 U.S. Army Corps of Engineers report DOE-ORP tasked WTP Contractor to update the 2005 Estimate at Completion dated December 31, 2005.

As the Independent Validation Review of the updated December 2005 EAC progressed, a Congressional fiscal year (FY) 2006 funding reduction to $521M resulted in the need for an additional revised EAC. At the direction of DOE, WTP Contractor is preparing that EAC, which is due May 30, 2006.

Thank you, Mr. Chairman and Members of the Subcommittee. This concludes my statement. I will be happy to answer any questions.

[2]By definition, "validation" is a review of the contractor's methods used to calculate cost estimates. It entails the review of cost drivers and high cost areas to determine if methods described are being used. The review team will make an assessment as to the level and amount of review required to validate a final estimate. During review, consideration will also be given to scope and schedule. Within the validation report, the Team will provide any findings, observations, recommendations and conclusions.