



U.S. Department of Energy
Office of River Protection

P.O. Box 450
Richland, Washington 99352

04-ESQ-070

Mr. J. P. Henschel, Project Director
Bechtel National, Inc.
2435 Stevens Center
Richland, Washington 99352

Dear Mr. Henschel:

CONTRACT NO. DE-AC27-01RV14136 – STANDARDS SELECTION PROCESS
ASSESSMENT REPORT A-04-ESQ-RPPWTP-012

This letter forwards the results of the U.S. Department of Energy, Office of River Protection assessment of the Bechtel National, Inc. standards selection process for the Waste Treatment and Immobilization Plant from July 26 through 29, 2004. For standards selection, the Contractor is required to follow the Integrated Safety Management (ISM) process described in Appendix A of the Safety Requirements Document (SRD). The primary focus of the assessment was on the Contractor's implementation of ISM as it pertains to standards selection.

The assessors found the Contractor's implementation of their standards selection process acceptable and compliant with the requirements of the Contract (DE-AC27-01RV14136) and SRD, Appendix A. No Findings were identified.

If you have any questions, please contact me, or your staff may call Robert C. Barr, Director, Office of Environmental Safety and Quality, (509) 376-7851.

Sincerely,

Roy J. Schepens
Manager

ESQ:RWG

Attachment

cc w/attach:
D. Kammenzind, BNI
W. R. Spezialetti, BNI
J. M. Eller, PAC

U. S. DEPARTMENT OF ENERGY
Office of River Protection

ASSESSMENT: Standards Selection Process

REPORT No.: A-04-ESQ-RPPWTP-012

FACILITY: Bechtel National, Inc.

LOCATION: 2435 Stevens Center
Richland, Washington 99352

DATES: July 26 through 29, 2004

ASSESSORS: R. W. Griffith, Lead Assessor
N. N. Kaushal, Assessor

APPROVED BY: P. P. Carier, Verification and Confirmation Official
Environmental Safety and Quality Division

Executive Summary

Assessment of Implementation of the Waste Treatment and Immobilization Plant (WTP) Contractor's Standards Selection Process

Introduction

From July 26 through 29, 2004, the U. S Department of Energy, Office of River Protection, Office of Environmental Safety and Quality assessed the Waste Treatment and Immobilization Plant (WTP) Contractor's programs for implementation of its Standards Selection Process. The assessment team utilized Inspection Technical Procedure I-105, "Standards Selection Process," for the items and activities reviewed. The team interviewed Contractor personnel and reviewed documents and records to determine whether the standards were being properly selected in accordance with the Contract (DE-AC27-01RV14136), Safety Requirements Document (SRD), and Contractor implementing procedure requirements. The assessment of the Contractor's standards selection process covered the following areas:

- Implementation of the Integrated Safety Management (ISM) process as it related to ISM Cycle III; and
- Implementation of the ISM process with respect to changes in plant design:
 - Review of ISM implementation for the carbon bed adsorbers (mercury abatement skids) added to the designs of the High-Level Waste (HLW) and Low-Activity Waste (LAW) melter secondary offgas systems;
 - Review of ISM implementation for design changes made to incorporate valve-regulated lead-acid (VRLA) storage batteries into the WTP design;
 - Review of ISM implementation for the design changes made to the Pretreatment cesium ion exchange columns; and
 - Review of ISM implementation for the disposition of the ammonium nitrate issue associated with the LAW melter offgas system.

Significant Observations and Conclusions

For the ISM and standards selection process documentation reviewed, the assessors found the Contractor's programs had implemented the Contract, SRD, and Contractor implementing procedure requirements for the selection of standards. No deviations to the Contract, SRD, or Contractor implementing procedure requirements were evident for the documents reviewed.

The assessment focused on the implementation of the Contractor's ISM and standards selection processes for recent design changes involving the addition of carbon bed adsorbers (mercury abatement skids) to the HLW and LAW melter secondary offgas systems, the use of VRLA

storage batteries, modification of the Pretreatment cesium ion exchange columns, and dispositioning of the ammonium nitrate issue in the LAW melter offgas system. For many of these changes, new, revised or tailored standards were not required; thus, the standards selection and confirmation processes could not be fully assessed with respect to such changes. However, the Contractor's ISM process, as implemented for these design changes, was assessed for the applicable ISM elements, up to and including, in some cases, the basis for the Contractor's determination that new, revised, or tailored standards were not required.

At the entrance meeting, the assessors informed the Contractor they would review the closure basis for the open Finding and three Assessment Follow-up Items (AFI) from the previous Standards Selection Process inspection (May 2003). The Contractor was unable to provide any closure documentation during the week of the assessment; thus, the Finding and three AFIs remain open.

Assessment of Implementation of the Waste Treatment and Immobilization Plant (WTP) Contractor's Standards Selection Process

Assessment Purpose and Scope

From July 26 through 29, 2004, the U.S. Department of Energy (DOE), Office of River Protection (ORP), performed an assessment of implementation of the WTP Contractor's Standards Selection Process. The assessment team utilized Inspection Technical Procedure, I-105, "Standards Selection Process" for the items and activities assessed. The team interviewed Contractor personnel and reviewed documents and records to determine whether standards were being selected in accordance with the Integrated Safety Management (ISM) Process committed to in the Contract (DE-AC27-01RV14136) and the Contractor's Safety Requirements Document (SRD). The team's assessments were documented in Assessment Notes and have been maintained electronically. Copies of the Assessment Notes are available upon request.

The purpose of this assessment was to verify that the Contractor was appropriately implementing the standards selection process in developing and refining subordinate standards and new standards, as well as modifications to existing standards, when substantial changes occur to the facility or to elements of the facility process. The Contractor has committed to the standards selection process described in Appendix A of the SRD.

Overall Conclusions

The assessors concluded for the sample of design, ISM and standards selection output documents reviewed, and from the interviews conducted with Contractor personnel, the Contractor was properly implementing the ISM and standards selection processes in accordance with the Contract (DE-AC27-01RV14136) and SRD Appendix A requirements. The assessors further concluded the Contractor was properly following the requirements of Contractor procedures developed to implement the Contract and SRD ISM standards selection process requirements.

Significant Observations and Assessment Results

The objectives of this assessment included:

- Verification of the adequacy of the Contractor's process for identifying and justifying the appropriate and applicable standards;
- Verification of the Contractor's use of the DOE/RL-96-0004 Standards Selection Process, as committed to by the Contractor in SRD Appendix A, in developing and refining subordinate standards and new standards, as well as modifications to existing standards, when substantial changes occur to the facility or to elements of the facility process; and
- Verification of the Contractor's documented justifications for changes to approved standards and maintenance of records of linkages in the steps (e.g., work identification, hazards analysis, hazard controls selection, and standards selection and confirmation) in the

Standards Selection Process.

To accomplish these objectives, the assessors evaluated the Contractor's ISM and standards selection processes for recent design changes to WTP process buildings and one process issue involving significant potential hazards. The design changes and process issue included:

- 24590-WTP-SE-ENS-03-033, Revision 0, "Rearrangement and Relocation of HLW Melter Secondary Offgas System;"

This change involved the relocation of the sulfur-impregnated carbon bed adsorber upstream in the High-Level Waste (HLW) melter secondary offgas system to protect the catalytic oxidation unit from poisoning by mercury.

- 24590-WTP-SE-ENS-03-1261-0, "Addition of the Activated Carbon Bed Adsorbers to the LAW Offgas System for Mercury Abatement and Removal;"

This change pertains to the addition of activated carbon bed adsorbers to the Low-Activity Waste (LAW) offgas system to prevent mercury in the LAW offgas stream from poisoning the thermal catalytic oxidizer/selective catalytic reactor.

- 24590-WTP-SE-ENS-04-0007, Revision 0, "Replace IEEE 450 and IEEE 484 with IEEE 1187 and update the Revision Years for IEEE 485 and IEEE 741 in the SRD and PSARS;"

The change pertains to revising the SRD to include an Institute of Electrical and Electronics Engineers, Inc. (IEEE) standard that applies to valve-regulated lead-acid (VRLA) batteries. The current WTP design cannot physically accommodate (due to limited space) large vented lead-acid batteries, but the IEEE standards currently specified in the SRD are not appropriate for the VRLA batteries. This change is intended to correct this discrepancy.

- 24590-WTP-SE-ENS-03-1144, Revision 1, "Hydrogen Mitigation/Emergency Elution/Flooded Column Design;" and

This Authorization Basis Amendment Request involved a number of changes to the Pretreatment Building Cesium Ion Exchange Process system and safety classification, control strategy, and SRD standards revisions consistent with DOE-STD-3009.

- 24590-WTP-SE-ENS-04-100-0, "Ammonium Nitrate Deposition."

The assessors reviewed the Contractor's record of ISM meetings to evaluate the hazard associated with the potential deposition of ammonium nitrate (AN) at various locations in the LAW offgas system.

For each of the design change or process issue documents identified above, the assessors evaluated the change or resolution process against the Contract, SRD, and Contractor implementing procedure requirements for the ISM and standards selection processes. The

following subsections contain a summary description of the review performed and the conclusions reached regarding the applicable ISM process elements.

Formation of the ISM Team and Work Identification

The assessors reviewed Process Management Team (PMT) and ISM work identification meeting minutes. The assessors concluded that the PMT was adequately establishing ISM teams for the variety of systems and plant areas within the WTP buildings and the disciplines identified for membership on ISM teams were appropriate for the scope of the design changes analyzed. The assessors further determined that meeting chairmen provided good compilations of information and documentation for performance of the hazards and operability (HAZOP) analysis and appropriate action items and responsible individuals were identified for additional information required to effectively complete the HAZOP.

The assessors found the work identification process for the HLW melter secondary offgas system was properly performed in accordance with SRD Appendix A and Contractor implementing procedure requirements.

Hazards Analysis and Selection and Documentation of Preferred Control Strategies

The assessors interviewed Contractor personnel and reviewed documents and records for HAZOP analyses and the selection of preferred control strategies for the design changes discussed above. Based on these interviews and reviews, the assessors concluded that:

- ISM teams included qualified personnel representing appropriate functional disciplines within the Contractor's organization;
- HAZOP analyses were performed in accordance with the American Institute of Chemical Engineers "Guidelines for Hazard Evaluation Procedures Second Edition with Worked Examples;"
- The ISM teams considered multiple control strategies, using an iterative approach, before a final control strategy was identified;
- The results of the HAZOP studies and the control strategy evaluations were appropriately incorporated into the Standards Identification Process Database (SIPD) and appropriate safety analyses to support the changes were performed;
- The ISM team thoroughly considered the potential for AN deposition at various points in the LAW offgas system and the potential for explosions from ignition of the deposited AN. The team systematically considered various control strategies for prevention of AN deposits and identified final control strategies which were reflected in SIPD, including appropriate estimates of event frequencies and severity levels, selected control strategies, and safety case requirements (SCR); and

- Action items from HAZOP and control strategy selection meetings were captured in an ISM Meetings Action Tracking database with near term completion dates.

The assessors concluded that the HAZOP and control strategy selection portions of the Contractor's ISM process were performed in accordance with the requirements of the Contract, SRD Appendix A and the Contractor's implementing procedures. In addition, the assessors determined the Contractor had adequate controls in place to track and ensure completion of ISM action items.

Design Basis Event (DBE) Selection and Analysis

The assessors interviewed Contractor personnel and reviewed documents and records from the Contractor's DBE selection process, subsequent DBE analyses, and engineering specifications for the design changes discussed above. Based on these interviews and reviews, the assessors concluded that:

- The process used by the Contractor to determine potential DBE was consistent with the ISM requirements from SRD Appendix A;
- Control strategy development records documented in SIPD were consistent with the potential events identified through the HAZOP and control strategy selection processes (see discussion above);
- DBE calculations provided a technical basis for concluding that radiological and toxicological exposures to the public and co-located workers were within exposure guidelines; and
- Potential events were properly evaluated to determine if they represented the highest qualitative risk and/or presented the greatest challenge to the selected controls.

The assessors concluded the DBE selection and analysis processes were acceptable and met SRD Appendix A and Contractor implementing procedure requirements. Further, the assessors determined that identified SCR were adequately addressed in the design, design output documentation, and/or safety analyses.

Standards Selection Process

The assessors interviewed Contractor personnel and reviewed documents and records from the Contractor's standards selection process for the design changes discussed above. While not all of the design changes required new, revised, or tailored standards, the assessors were able to conclude that:

- The Contractor was adequately identifying changes to SRD implementing codes and standards and the preliminary safety analysis report resulting from application of DOE-STD-3009. This included the tailoring of a number of standards to include reference to Safety

Class and Safety Significant where previous tailoring of the standard included references to Safety Design Class and Safety Design Significant;

- The PMT was adequately performing its assigned standards selection process responsibilities; and
- The specification of codes and standards for the design changes assessed were acceptable and SRD compliant.

The assessors concluded that the Contractor's standard selection process, as an element of the ISM process, was being adequately and effectively performed in accordance with requirements from SRD Appendix A and Contractor implementing procedures.

Structures, Systems, and Components Comprising the Hazard Control Strategy

While the assessors did not conduct a thorough technical review of the changes and the associated control strategies, the assessors concluded that the Contractor's process for assigning important-to-safety classifications to structures, systems and components (SSC) comprising the selected control strategies was consistent with the requirements of the Contract, SRD Appendix A and Contractor implementing procedures. In addition, the assessors found tentative SSC classifications for the in-progress design changes discussed above consistent with the credit taken for these components in the DBE analysis.

Project Safety Committee Confirmation of Standards

The assessors interviewed Contractor personnel and reviewed documents and records to assess the adequacy of the Process Safety Committee (PSC) process for the confirmation of standards for the design changes discussed above. While not all of the design changes required new, revised, or tailored standards, the assessors were able to review sufficient documentation to conclude that the PSC was performing their standards confirmation function in accordance with the SRD Appendix A and Contractor implementing procedures.

List of Assessment Items Opened, Closed, and Discuss

Opened

None

Closed

None

Discussed

One open Finding (A-03-OSR-RPPWTP-013-F01) and three open Assessment Follow-up Items (AFI) (A-03-OSR-RPPWTP-013-A02, A-03-OSR-RPPWTP-013-A03, and A-03-OSR-RPPWTP-013-A04) from the May 2003 Standards Selection Process inspection were discussed

with Contractor personnel. The Contractor provided a summary of their efforts to close these items to date; however, the Contractor could provide no documented evidence to allow the assessors to determine if adequate closure was achieved. As such, the Finding and AFIs will remain open for closure verification review during a future ORP assessment.