



U.S. Department of Energy
Office of River Protection

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

04-ESQ-093

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

Dear Mr. Henschel:

CONTRACT NO. DE-AC27-01RV14136 – AUTHORIZATION BASIS (AB)
MAINTENANCE IMPLEMENTATION ASSESSMENT REPORT – A-04-ESQ-RPPWTP-009

This letter forwards the results of the U.S. Department of Energy, Office of River Protection (ORP) assessment of Bechtel National, Inc. (BNI) AB Maintenance program for the Waste Treatment and Immobilization Plant during the period September 20 through 27, 2004. The last inspection of this area was during the period of September 15 through 24, 2003.

BNI staff performed AB maintenance in a manner consistent with the requirements of RL/REG-97-13. Improvements have been made in performance since the last assessment. Four Findings were identified. These Findings represent instances of inattention to detail rather than significant safety weaknesses. The Finding in the area of training of those involved in AB maintenance is important and warrants particular attention (A-04-ESQ-RPPWTP-009-F03). Five Observations were identified, three of which warrant special attention. One Observation involved the failure of the staff to consider consequences of similar related events associated with a change that was made to the Pretreatment Facility evaporator separator (A-04-ESQ-RPPWTP-009-O03); another involved failure to identify and correct deficiencies in the Preliminary Safety Analysis Report during another related review (A-04-ESQ-RPPWTP-009-O04); and the third involved the poor application of BNI's Price-Anderson Amendments Act (PAAA) reporting program (A-04-ESQ-RPPWTP-009-O05). In general, procedures were consistent with requirements and properly implemented. BNI staff was knowledgeable and generally well-trained, and documentation was adequate.

ORP review of PAAA Report 2004-0003 suggests that its issues should have been reported. This report contains 54 Corrective Action Reports associated with the AB Maintenance program and is indicative of a programmatic failure. It is our understanding that BNI believes the issue did not warrant reporting because the program has been improving. The procedure compliance trend noted by the Performance Review Board is not an appropriate reason for not reporting non-compliance issues. If a reportable condition exists, it should be reported regardless of corrective actions taken. Actions taken to resolve the issue and results achieved are relevant to the corrective actions described in the Noncompliance Tracking System with respect to the reported condition.

Mr. J. P. Henschel
04-ESQ-093

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Complete details of the assessment, including the Findings, are documented in the attached assessment report. You are requested to provide written responses to these Findings and Observations within 30 days of receipt of this letter unless indicated otherwise in the attached Assessment Report. The responses should include:

- Admission of denial of the Findings;
- The causes of the Findings if admitted and, if denied, the reason why;
- The corrective steps that have been taken and the results achieved;
- The corrective steps that will be taken to prevent further Findings; and
- The date when full compliance with applicable commitments will be achieved.

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,

ESQ:PPC

Roy J. Schepens
Manager

Attachment

cc w/attach:
G. Shell, BNI
Administrative Record

U.S. DEPARTMENT OF ENERGY
Office of River Protection
Environmental Safety and Quality

ASSESSMENT: Authorization Basis Maintenance Implementation Assessment Report

REPORT: A-04-ESQ-RPPWTP-009

FACILITY: Bechtel National, Inc.

LOCATION: Richland, Washington

DATES: September 20-27, 2004

ASSESSORS: W. Pasciak, DOE-ORP, Lead Assessor
R. Griffith, DOE-ORP, Assessor
R. Smoter, DOE-ORP, Consultant, Assessor

APPROVED BY: P. P. Carier, Verification and Confirmation Official

Executive Summary

Introduction

From September 20 through 27, 2004, the U.S. Department of Energy, Office of River Protection (ORP) assessed the implementation of the Waste Treatment and Immobilization Plant (WTP) Contractor's program for maintaining the authorization basis (AB). The contractor for the design and construction of the WTP is Bechtel National, Inc. (BNI). The assessment team (Team) evaluated the Contractor's performance related to maintenance of the AB; the adequacy of the integration of the AB maintenance process with the approval process for changes to the WTP facility design and with project programs and procedures; the safety evaluation (SE) process being conducted as specified in the Quality Assurance Manual (QAM); the adequacy of the AB process implementation to determine if reviews of design changes against the Preliminary Safety Analysis Report (PSAR) and against design requirements are being made; the adequacy of the Contractor's management assessment of AB/design consistency; the adequacy of the AB maintenance training; and the adequacy of AB documentation module and the training and experience of staff performing SEs.

Significant Conclusions and Issues

- The Team found the Contractor was continuing to improve its processes for AB maintenance. In general, procedures were consistent with requirements and were properly implemented. The Contractor's staff was knowledgeable and generally well-trained, and documentation was adequate. The current assessment identified no new programmatic issues.
- Four Findings were identified, two containing three examples each:
 - The first Finding contains three examples where the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 or 3.6 associated with making changes using the Authorization Basis Amendment Request process. The examples are the following: 1) the SE not being performed against the AB documents; 2) the SE failing to identify facility changes as not conforming to the safety and requirements document (SRD); and 3) SRD changes submitted and reviewed against the wrong revision of the SRD;
 - The second Finding contains three examples where the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 associated with making changes that do not require prior ORP review and approval. The examples are the following: 1) the SE incorrectly indicating that the change complied with laws and regulations; 2) the SE failed to verify that the change to the starting system did not result in more than a minimal increase in the frequency of an analyzed design basis events; and 3) the change failed to provide adequate safety because the control strategy did not provide for timely evacuation of the facility in an event;

- The third Finding involves several instances where Contractor personnel that signed off on the SEs as the Preparer or Environmental and Nuclear Safety Supervisor were not listed on the List of Qualified Individuals (LQI), had not or were not scheduled to complete these training modules, or both. This is inconsistent with the Contractor's QAM requirements that personnel performing activities governed by the Quality Assurance program are trained to perform their assigned responsibilities. The LQI deficiency was identified by the Contractor in a management assessment performed just prior to the ORP assessment and a Corrective Action Report (CAR) was issued (24590-WTP-CAR-QA-04-141); however, the CAR failed to address the issue with SE preparers and reviewers not receiving training on the revised procedures and process for AB and Safety Envelope maintenance (management attention is warranted);
- The fourth Finding involves the iLibrary database, available at each designer and safety analyst's work station, that did not contain a complete set of up-to-date AB/safety envelope documents. Contractor Environmental and Nuclear Safety (E&NS) personnel are trained and required by procedure (24590-WTP-GPP-SREG-002 and 24590-WTP-3DP-G04T-00913) to use the latest version of the Safety Envelope Documents, (i.e., PSAR Chapters 3.3, 3.4, 4.0, and 5.0) and the SRD to evaluate new and changed designs for AB/safety envelope impact. Contractor E&NS personnel are expected to use the database iLibrary to access the AB and Safety Envelope documents when performing safety screenings and safety evaluations, rather than possess and rely upon hard, controlled copies of these documents. The Contractor was not maintaining the electronic database (iLibrary) used by E&NS personnel performing safety screens and SEs complete and current. This condition could potentially result in safety screens and SE failing to assess the full extent of impacts to AB and safety envelope documents from new and revised design output documents. This is inconsistent with the Contractor's QAM, Revision 5, Policy Q-06.1, "Document Control."
- Five Observations were identified:
 - Procedure requirements were not clear on when safety screening should be performed;
 - The Contractor proposed changes to SRD that were not consistent with the SRD. The Contractor proposed to add text that stated that raceway system for safety class (SC) circuits were not SC. The SRD states that such systems would be designated SC;
 - The Contractor proposed to delete the control strategy for the cesium eluant recovery process system (CNP) evaporator foaming events because the Contractor successfully demonstrated that foaming in the CNP evaporator is not a credible event. During the review of the Authorization Basis Amendment Request (ABAR), ORP reviewers determined that events involving a sudden intrusion of air into the waste feed piping were credible and would result in High consequences to workers. The control strategies for CNP evaporator foaming were an inline radiation monitor in the condensate line of the evaporator separator vessel to shut down the feed to the evaporator separator upon detection of excessive radiation dose rate. This control strategy could under some

circumstances protect against the sudden intrusion of air if the air intrusion is through the feed lines to the evaporator separator, but under other circumstances such as a failed pump housing or seal, it would not provide protection. As a result of ORP reviewer concerns, the Contractor designated the boundary below the liquid level in the CNP evaporator as safety significant. The failure of the Contractor to not identify the High consequences of an air intrusion event in the CNP evaporator and to develop corresponding control strategies is not a Finding because the ABAR did not propose changes in this area. Nevertheless, because the air intrusion event is similar to the foaming carryover event which was the subject of the ABAR, it does demonstrate a lack of attention to safety by the team performing the SE for this ABAR (management attention is warranted);

- The Pretreatment PSAR does not appropriately address hazard controls for a potential backflow event associated with the cesium ion-exchangers in Attachment A of the PSAR and does not identify structures, systems, and components associated with preventing this event in Chapter 4 of the PSAR. This deficiency should have been addressed during the processing of ABAR 24590-WTP-SE-ENS-03-1144 or SE 24590-WTP-SE-ENS-04-091 (management attention is warranted); and
- ORP review of Price-Anderson Amendments Act (PAAA) Report 2004-0003, suggests that the issues of this report should have been reported. This report contains 54 Corrective Action Reports associated with the AB Maintenance program and is indicative of a programmatic failure. It is our understanding that BNI believes that the issue did not warrant reporting because the program has been improving. The procedure compliance trend noted by the Performance Review Board is not an appropriate reason for not reporting non-compliance issues. If a reportable condition exists, it should be reported regardless of corrective actions taken. Actions taken to resolve the issue and results achieved are relevant to the corrective actions described in the non-compliance tracking system with respect to the reported condition (management attention is warranted).
- The Findings and Observations in the above two bullets represent a small part of the activities in the AB maintenance area.

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List of Acronyms

AB	authorization basis
ABAR	Authorization Basis Amendment Request
BNI	Bechtel National, Inc.
CAR	Corrective Action Report
DBE	Design Basis Event
DOE	U.S. Department of Energy
HLW	High Level Waste
ITS	important-to-safety
LAW	Low Activity Waste
PSAR	Preliminary Safety Analysis Report
ORP	Office of River Protection
SC	Safety Class
SS	Safety Significant
SDC	Safety Design Class
SSC	structures, systems, and components
SC-I	Seismic Category I
SE	Safety Evaluation
SRD	Safety Requirements Document
WTP	Waste Treatment and Immobilization Plant

Assessment of Waste Treatment and Immobilization Plant (WTP) Authorization Basis (AB) Maintenance Program, September 20 - 27, 2004

Assessment Purpose and Scope

This assessment reviewed the Contractor's performance related to maintenance of the AB; the adequacy of the integration of the AB maintenance process with the approval process for changes to the WTP facility design and with project programs and procedures; the safety evaluation process being conducted as specified in the Quality Assurance Manual (QAM); the adequacy of the AB process implementation to determine if reviews of design changes against the Preliminary Safety Analysis Report (PSAR) and against design requirements are being made; the adequacy of the Contractor's management assessment of AB/design consistency; the adequacy of the AB maintenance training; and the adequacy of AB documentation module and the training and experience of staff performing safety evaluations.

Significant Observations and Conclusions

The Contractor performed AB maintenance in a manner consistent with the requirements of RL/REG-97-13. Significant improvements have been made in performance since the last assessment in this area. While four Findings were identified, they generally represent minor instances of inattention to detail rather than significant safety weaknesses. One Finding in the area of training of those involved in AB maintenance is important and warrants particular attention (A-04-ESQ-RPPWTP-009-F03). Five Observations were identified, three of which should receive special attention. One involved the failure of the Contractor to proposed changes to the safety and requirements document (SRD) that are consistent with U.S. Department of Energy (DOE) requirements (A-04-ESQ-RPPWTP-009-O02); another involved the failure of the staff to consider consequences of similar related events associated with a change that was made to the Pretreatment (PT) Facility evaporator separator (A-04-ESQ-RPPWTP-009-O03); another involved deficiencies in PT PSAR that should have been corrected by the Contractor (A-04-ESQ-RPPWTP-009-04); and one involved the application of the Contractor's Price-Andersons Amendment Act (PAAA) reporting program (A-04-ESQ-RPPWTP-009-O05). In general, procedures were consistent with requirements, and being properly implemented. The Contractor's staff was found to be knowledgeable and generally well-trained, and documentation was good. The Findings and Observations represent a small part of the activities in the AB maintenance area.

ASSESSMENT TEAM CONCLUSIONS:

Procedure for AB Maintenance for implementation of RL/REG-97-13

The inspectors concluded that, while there were a few terminology differences between the Contractor procedures for AB Maintenance and RL/REG-97-13, the intent of the requirements in RL/REG-97-13 were consistently and adequately addressed in the Contractor's procedures. No discrepancies between RL/REG-97-13 and the Contractor procedures were identified. The inspectors concluded that none of the terminology differences were significant to the preparation, review, approval, and control of changes to project AB documents. In addition, since RL/REG-97-13 identified itself (Introduction) as a guidance document, the inspectors concluded that consistency between the requirements of Contractor procedures and the intent of guidance within RL/REG-97-13 was sufficient. Implementation of the requirements in these Contractor procedures should result in management of the WTP AB in compliance with the expectations of DOE Office of River Protection (ORP), as delineated in RL/REG-97-13.

However, one Observation was identified concerning a potential weakness in the Contractor's Engineering Design Review (EDR)/safety screening procedure (24590-WTP-3DP-G04T-00913). Since the last AB Maintenance inspection, the safety screening process has been revised such that the safety screening is performed on the EDR form in accordance with the EDR procedure. The inspectors determined this procedure was vague on when the safety screen is performed during the EDR process, creating the potential that safety screens are performed on new and changed design documents before significant comments are dispositioned and reflected on these documents.

Implementation of AB Maintenance Procedures

During the last AB Maintenance inspection, the inspectors observed that Engineering had not always completely described the changes made to the design in the Description of Design Change section of the safety evaluation form; accordingly, Environmental and Nuclear Safety (E&NS) evaluators had not evaluated all changes potentially affecting the AB/safety envelope. This issue was reviewed during this assessment by the review of design change safety evaluations, administrative control safety evaluations, and categorical exclusion safety evaluations and by interviews of Contractor design and E&NS personnel. The assessors determined the safety evaluations included adequate descriptions of and the reasons for the design changes evaluated. The assessors also found the answers to the safety evaluation questions, including their bases, to be appropriate and acceptable.

Based on interviews conducted with Contractor design and E&NS personnel responsible for the safety evaluations reviewed by the assessors, the assessors concluded that past problems with deficient descriptions of changes have been resolved. Contractor E&NS personnel interviewed produced the completed EDR forms showing adequate safety screening of all design changes with potential safety envelope impacts.

Review of Safety Evaluations

Since the last assessment of this area, more than 60 safety evaluations have been reviewed by ORP. Of those 60, only a small number has resulted in issues identified in this report as Findings or Observations. In most cases the identified issues are of minor safety significance. Below are discussed two Findings, each with three examples identified and two Observations related to these safety evaluations. In general, the quality of the safety evaluations has improved since the last assessment in this area.

Knowledge of Staff in AB Maintenance

The assessors concluded personnel performing design changes and safety screenings/safety evaluations were knowledgeable of the AB maintenance program and procedure requirements and ensured no deleterious impact on safety resulted from changes to the AB. Personnel interviewed were aware of vulnerabilities in the process identified in prior inspections/assessments and all stated that recent changes made to the AB maintenance process and procedures had adequately eliminated these vulnerabilities. In addition to their knowledge of the AB maintenance process and procedures, the assessors found Contractor personnel understood project documents comprising the AB, the project documents which constitute the Safety Envelope Document (SED) for each facility (i.e., the facility PSAR Chapters 3.3, 3.4, 4.0, and 5.0, the SRD, and approved AB changes), and how to access the AB/safety envelope to assess design changes for impact [Design Criteria Database (DCD), AB documents, and SEDs as maintained in the database iLibrary and accessible from each person's work station].

The assessors identified no deficiencies relative to the requirements of RL/REG-97-13 or the other criteria documents identified above.

Review of Training in the AB Maintenance Area

The assessors found the information in the training modules consistent with the requirements from the Contractor's AB Maintenance procedures identified above and, as discussed in Assessment Notes A-04-ESQ-RPPWTP-009-01, these procedures were consistent with the requirements of RL/REG-97-13. Both training modules included knowledge tests that the assessors determined adequately challenged the trainee's knowledge of the material presented. No deficiencies were identified.

The assessors review of training records, training profiles, qualification lists, training delinquency reports, and training rosters and interviewed Contractor Engineering training management and personnel identified no deficiencies regarding the Contractor's process for tracking training requirements, training progress, and delinquencies. However, a Finding related to this topic is discussed below.

Adequacy of Documentation

The assessors evaluated the database containing the AB documents and DOE authorization documents used by Contractor E&NS personnel to assess new and revised design documents for potential AB/safety envelope impact. The assessors concluded the database did not contain a complete set of the latest AB and DOE authorization documents issued for use on the project. As such, the potential existed for safety screens and safety evaluations to have failed to assess the complete scope of AB and DOE authorization documents for impacts due to new or revised designs. A Finding on this matter is discussed below.

Contractor's PAAA Reporting Process

The DOE maintains a Non-compliance Tracking System (NTS) for identifying and tracking corrective actions associated with non-compliances with DOE nuclear safety requirements. The DOE uses information in the NTS as one source of information in providing oversight of DOE contractors. As an incentive for prompt non-compliance reporting and corrective action by contractors, DOE considers mitigating enforcement actions taken under 10 CFR 820 for non-compliances reported in NTS by the contractor.

The assessment team determined that on about May 12, 2004, the Contractor PAAA Coordinator Manager completed PAAA-2004-0003, which is an evaluation of 54 Corrective Action Reports (CAR) associated with the implementation of the Contractor's AB maintenance process that were issued over a period of two years. The evaluation concluded that non-compliances with DOE nuclear safety requirements occurred and that sufficient programmatic deficiencies existed that the condition was potentially reportable. Specifically, the condition described in PAAA-2004-0003 potentially met the "programmatic breakdown" threshold criteria described in relevant DOE guidance for reporting the condition into the NTS.

The assessment team found that the Contractor's PAAA process procedure required that potentially reportable non-compliances be reviewed by a PAAA Review Board (PRB), which consists of senior managers from various project organizations. The PRB makes recommendations to the Project Manager on whether or not to report the non-compliance. The Project Manager makes the final NTS reporting decision.

The assessment team reviewed the PRB meeting minutes (CCN 089494) and found that the PRB met on May 17, 26, and 28, 2004, to discuss PAAA-2004-0003. The PRB decided that the identified non-compliance was reportable. An action item was established by the PRB to make a written recommendation to the Project Manager regarding the NTS report by June 7, 2004.

From discussions with the PAAA Coordinator Manager and a review of e-mail messages, the assessment team found that PRB Chairman reversed his decision to report the non-compliance. The decision was based on an analysis of "procedure non-compliances" associated with the authorization basis process with respect to time and data provided by engineering organization

regarding design document conformance with authorization basis information. The remainder of the PRB members were informed of this decision by e-mail on June 17, 2004. Based on this e-mail, the remaining PRB members that originally determined to report the non-compliance also reversed their decisions. The assessment team found that on June 21, 2004, a memorandum was written by the PRB chairman that recommended that the condition described in PAAA-2004-0003 not be reported. The Project Manager accepted this recommendation.

The assessment team concluded that:

- The process used by the PRB to reach its decision on PAAA-2004-0003 was not consistent with the Contractor's PAAA process procedure;
- The reportability decision process for PAAA-2004-0003 was not timely;
- The condition identified in PAAA-2004-0003 is reportable; and
- The contractor's basis for reversing its decision regarding the reportability of PAAA-2004-0003 is inadequate

This item is described as an Observation below.

Items Opened, Closed, and Discussed

Opened Findings

A-04-ESQ-RPPWTP-009-F01: The Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 or 3.6 associated with making changes using the Authorization Basis Amendment Request (ABAR) process.

Requirements:

Contract No: DE-AC27-01RV14136¹ states in Standard 7 Section (e) (2) (iii) the Contractor's Integrated Safety Management Plan (ISMP) shall conform with RL/REG-97-13, "Office of River Protection Position on Contractor-Initiated Changes to the Authorization Basis." Section 1.4 of the ISMP refers to the SRD, Appendix I. Appendix I states in Section 3.3 that Changes to the AB will be in accordance with RL/REG-97-13.

Discussion:

RL/REG-97-13, Revision 10, Position 3.6 provides requirements for submitting changes to ORP for review and approval using the ABAR process. The following examples represent instances where the ABAR process described in RL/REG-97-13 was not followed.

- RL/REG-97-13, Revision 10, Position 3.6 states that an amendment request submitted to ORP by means of an ABAR shall include a safety evaluation as described in Position 3.5.a. Position 3.5.a states, in part, that each such safety evaluation must determine that the change complies with all applicable laws and regulations, conforms to the SRD and provides adequate safety.

The assessor examined several completed "Safety Evaluations for Design" forms, specifically those associate with ABARs to determine if the requirements of RL/REG-97-13, Revision 10, were being followed. RL/REG-97-13, Revision 10, Position 3.6 states that an amendment request submitted to ORP by means of an ABAR shall include a safety evaluation as described in Position 3.5.a. Position 3.5.a states, in part, that each such safety evaluation must determine that the change complies with all applicable laws and regulations, conforms to the SRD and provides adequate safety.

During the period of December 2003 through June 2004, the Contractor submitted ABARs 24590-WTP-SE-ENS-03-521; 24590-WTP-SE-ENS-03-155; 24590-WTP-SE-ENS-03-368; 24590-WTP-SE-ENS-04-008; 24590-WTP-SE-ENS-04-021; 24590-WTP-SE-ENS-04-026; and 24590-WTP-SE-ENS-03-188 to ORP and the ABARs did not provide safety evaluations against AB documents. Safety Evaluations for Design, Form 24590-SREG-F00010

¹ Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2002.

Revision 6 through 10, provided text that caused the preparer to evaluate the change not against the PSAR, which is an AB document, but against the SED, which is not an AB document. No statement of equivalency between the SED and the PSAR is made in these safety evaluations.

In Safety Evaluations for Design, Form 24590-SREG-F00010 Revision 13, approved on June 30, 2004, the Contractor added the statement “the SED represents the currently approved PSAR safety envelope sections, plus approved changes.” This statement was made in a letter² from Bechtel National, Inc. (BNI) to ORP in which BNI described changes it would make in response to ORP concerns. In addition, since issue was brought to the attention of BNI, the Contractor began stating in its safety evaluations in the block “Affected Authorization Basis and/or SED Documents” that the safety evaluation affects the PSAR facility specific information (as represented by the SED). These corrective actions adequately address ORP concerns described above.

For the examples noted above, the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.6, by not documenting the review as being made against AB documents. As corrective actions have been put in place as described above, no response to this Finding is required.

- RL/REG-97-13, Revision 10, Position 3.6 states that an amendment request submitted to ORP by means of an ABAR shall include a safety evaluation as described in Position 3.5.a. Position 3.5.a states, in part, that each such safety evaluation must determine that the change complies with all applicable laws and regulations, conforms to the SRD and provides adequate safety.

Safety Evaluation (SE) 24590-WTP-SE-ENS-03-155, reclassified the High-Level Waste (HLW) facility Melter Feed and Melter Preparation/Radioactive Liquid Waste Disposal System vessel interlocks. The proposed change failed to provide adequate safety because the proposed facility changes were inconsistent with the SRD. Specifically, the high-high vessel interlocks reclassified from safety design significant (SDS) to additional protection class (APC) and corresponding changes to SRD safety criteria that addressed requirements for APC systems were not proposed to be modified to include requirements for APC systems.

SE 24590-WTP-SE-ENS-03-188, reclassified the pretreatment facility high-high level interlocks for the ultimate overflow vessel (PWD-VSL-00033). The proposed change failed to provide adequate safety because the proposed facility changes were inconsistent with the SRD. Specifically, the high-high vessel interlocks reclassified from SDS to APC and corresponding changes to SRD safety criteria that addressed requirements for APC systems were not proposed to be modified to include requirements for APC systems.

The Contractor should have included proposed changes to the SRD for Safety Criterion 4.1-3 and Appendix J. Safety Criterion 4.1-3 contains seismic design requirements for Important-

² Letter from J. P. Henschel to R. J. Schepens, “Authorization Basis Amend Request Referencing the Safety Envelope Document Rather than the Preliminary Safety Analysis Report,” CCN: 087994, dated May 6, 2004.

to-Safety (ITS) structures, systems, and components (SSC) and Appendix J is the Ad Hoc Implementing Standard for Startup. Since the issuance of these ABARs, SRD Safety Criterion has been modified through the approval of ABAR 24590-WTP-SE-ENS-04-011. Modifications to Appendix J have not yet been proposed.

- RL/REG-97-13, Revision 10, Position 3.6 states that an amendment request submitted to ORP by means of an ABAR shall include a copy of the AB document or appropriate excerpt showing the proposed revision.

In Attachment 1 to ABAR 24590-WTP-SE-ENS-04-044, the Contractor provided a copy of proposed revision to an unapproved version of the SRD. The proposed revision provided by the Contractor should have been against the current version of the SRD which was at the time of submittal of the ABAR, Revision 3f, dated March 17, 2004.

The three items above represent multiple examples where the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 or 3.6 associated with making changes using the ABAR process. The above instances are examples of: 1) the SE not being performed against the authorization basis documents; 2) the SE failing to identify facility changes as not conforming to the SRD; and 3) SRD changes submitted and reviewed against the wrong revision of the SRD. Failure to implement the requirement in Section 1.4 of the ISMP is considered a Finding with multiple examples (A-04-ESQ-RPPWTP-009-F01)

A-04-ESQ-RPPWTP-009-F02: The Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 associated with making changes that do not require prior ORP approval.

Requirements:

Contract No: DE-AC27-01RV14136³ states in Standard 7 Section (e) (2) (iii) the Contractor's ISMP shall conform with RL/REG-97-13, "Office of River Protection Position on Contractor-Initiated Changes to the Authorization Basis." Section 1.4 of the ISMP refers to the SRD, Appendix I. Appendix I states in Section 3.3 that Changes to the AB will be in accordance with RL/REG-97-13.

Discussion:

RL/REG-97-13, Revision 10, Position 3.5 provides requirements for processing changes that do not have to be reviewed and approved by ORP. The following examples represent instances where this process described was not followed. RL/REG-97-13, Revision 10, Position 3.5.a, states the Contractor may make changes to the facility without prior ORP approval provided a SE was performed and documented which demonstrates, among other things, the change "Will

³ Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2002.

continue to comply with all applicable laws and regulations, conform to top-level safety standards, and provide adequate safety.”

- SE 24590-WTP-SE-ENS-04-091, Revision 0, dated August 8, 2004, did not provide an adequate evaluation of eliminating air gap vessel CRP-VSL-00002 or eliminating a technical safety requirements (TSR) Design Feature associated with preventing contamination of the PT facility demineralized water system.

RL/REG-97-13, Revision 10, Position 3.5, requires that SE be documented such that a reviewer can identify the technical issues considered and the basis for determinations made in the SE. The basis provided for Part 1, Item 4 of WTP-SE-ENS-04-091 identified this change as a potentially significant design change by stating: “removal of the air gap vessel changes how a safety design class, safety class, or safety significant SSC meets its respective safety function;” however, the related Part 1 question was answered “No,” indicating that the change was not potentially significant. Contrary to the requirement of RL/REG-97-13, the issues considered in making the “No” determination were not discussed and the basis provided directly conflicted with the determination.

The SE approved a change to the Table 5A-2, “Pretreatment Facility Design Features for Preventing Hazardous Situations,” that eliminated a TSR Design Feature described as follows: “The vessel demineralized water inlets are located above air gap vessels to prevent diffusing of siphoning radionuclides into the demineralized water system” in the PT PSAR. The elimination of this Design Feature was not included in the scope of the change described in the SE and there was no documented evaluation of the issues considered or the basis for determining that this change did not require an ABAR and was acceptable under the criteria of RL/REG-97-13.

- SE 24590-WTP-SE-ENS-04-026, Revision 0, dated March 8, 2004, approved design changes to the Diesel Generators involving the replacement of the battery start system with an air start system.

Section 2.0.2 of RL/REG 97-13, Revision 10, states that a significant design change is, among other things, one that results in more than a minimal increase in the frequency or consequence of an analyzed design basis events (DBE) as described in the PSAR. In the SE, in the answer to Question #4, it is stated that the change does not result in more than a minimal ($\geq 10\%$) increase in the frequency or consequence of an analyzed DBE as described in the SED. The basis for this answer is described as “The DBE analysis does not address the starting system for the EDGs.”

Section 4.3.5 of the Balance of Facilities PSAR, Revision 1, states that the emergency diesel generators are a credited safety function and that they must be capable of providing a “reliable source of emergency power on demand.” To be able to meet this requirement, the starting system must be reliable. In making this change, the Contractor did not verify that the change to the starting system did not result in more than a minimal increase in the frequency

of an analyzed DBE. Contrary to the above, the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 and Section 2.0.2.

- Authorization Basis Change Notice (ABCN) 24590-WTP-SE-ENS-03-184, Revision 0, dated October 17, 2003, approved design changes to the HLW facility involving the downgrading of the C2 and C3 exhaust fan interlocks from ITS Risk Reduction Class to non-ITS design class. These interlocks trip the C2 and C3 exhaust fans on a loss of the C5 exhaust fans. Failure to trip the C2 exhaust fans on loss of the C5 exhaust fans, according to the ABCN and the PSAR, would lead to a SL-2 event to workers.

The credited control strategy for loss of C5 ventilation was described to be evacuation of the C2 areas. The control strategy of evacuation, as described in CSD-HHLW/N0012, is deficient in that it did not ensure that workers' in the C2 area would know to evacuate in the event of loss of the C5 fans. The Control Strategy Development (CSD) record indicated that "requirements including surveys of operating areas would verify safe occupancy requirements are met." Surveys are typically done prior to the start of a job and periodically throughout the job and do not ensure timely evacuation in the event of loss of C5 ventilation.

The contractor implemented a change to the facility under RL/REG-97-13 without properly implementing requirements of RL/REG 97-13, Revision 10, Position 3.5. Specifically, the SE did not properly evaluate the reclassification of C2/C3/C5 cascade fan interlocks. Consequently, the C2/C3/C5 interlocks were improperly reclassified as non-ITS SSCs.

The three items above represent multiple examples where the Contractor failed to implement the requirements of RL/REG 97-13, Revision 10, Position 3.5 associated with making changes that do not require prior ORP review and approval. They represent the implementation of changes to the facility without performing adequate SEs. The above instances are examples of: 1) the SE incorrectly indicating that the change complied with laws and regulations; 2) the SE failed to verify that the change to the starting system did not result in more than a minimal increase in the frequency of an analyzed DBE; and 3) the change failed to provide adequate safety because the control strategy did not provide for timely evacuation of the facility in an event. Failure to implement the requirement in Section 1.4 of the ISMP is considered a Finding with multiple examples (A-04-ESQ-RPPWTP-009-F02).

A-04-ESQ-RPPWTP-009-F03: The Contractor failed to implement the requirements of the QAM, Revision 4a, Policy Q-02.2, "Personnel Training and Qualification."

Requirements:

The Contractor's QAM, Revision 4a, Policy Q-02.2, "Personnel Training and Qualification," requires initial and continuing training. Continuing training must include training in significant applicable procedure changes, operating experience, and selected fundamentals with emphasis on knowledge and skills necessary to assure safety.

Discussion:

The assessors reviewed 35 completed SEs against the List of Qualified Individuals (LQI) and training records for those personnel who had completed or were scheduled to complete training modules 24590-WTP-CRM-TRA-000902 and 24590-WTP-CBT-TRA-000904. Several instances were found where Contractor personnel signing off on the SEs as the Preparer or Environmental and Nuclear Safety (ENS) Supervisor were not listed on the LQI, had not or were not scheduled to complete these training modules, or both. This is inconsistent with the Contractors QAM requirements that personnel performing activities governed by the Quality Assurance (QA) program are trained to perform their assigned responsibilities and is considered to be a Finding of this assessment. The LQI deficiency was identified by the Contractor in a management assessment performed just prior to the ORP assessment and a CAR was issued (24590-WTP-CAR-QA-04-141); however, the CAR failed to address the issue with SE preparers and reviewers not receiving training on the revised procedures and process for AB and SE maintenance.

Failure to implement the requirements of the QAM, Revision 4a, Policy Q-02.2, "Personnel Training and Qualification," is considered a Finding (A-04-ESQ-RPPWTP-009-F03).

A-04-ESQ-RPPWTP-009-F04: The Contractor failed to implement the requirements of the QAM, Revision 5, Policy Q-06.1, "Document Control."

Requirements:

The Contractor's QAM, Revision 5, Policy Q-06.1, "Document Control," requirement that AB documents, in hard copy or electronic media, including latest changes thereto, are controlled, reviewed for accuracy, approved for release, and distributed to and used at the location where work is being performed.

Discussion:

Contractor E&NS personnel are trained and required by procedure (24590-WTP-GPP-SREG-002 and 24590-WTP-3DP-G04T-00913) to use the latest version of the SEDs, (i.e., PSAR Chapters 3.3, 3.4, 4.0, and 5.0) and the SRD to evaluate new and changed designs for AB/safety envelope impact. Contractor ENS personnel are expected to use the database iLibrary to access the AB and Safety Envelope documents when performing safety screenings and SEs, rather than possess and rely upon hard, controlled copies of these documents. The assessors accessed the Contractor's iLibrary database, available at each designer and safety analyst's work station, and determined the electronic media did not contain a complete set of up-to-date AB/safety envelope documents.

The Contractor was not maintaining the electronic database (iLibrary) used by E&NS personnel performing safety screens and SEs complete and current, resulting in the potential for safety screens and SEs to fail to assess the full extent of impacts to AB and safety envelope documents from new and revised design output documents. This is inconsistent with the Contractor's QAM, Revision 5, Policy Q-06.1, "Document Control."

Failure to implement the requirements of the QAM, Revision 5, Policy Q-06.1, "Document Control," is considered a Finding (A-04-ESQ-RPPWTP-009-F04).

A-04- ESQ-RPPWTP-009-O01 – Procedure requirements were not clear on when the safety screen is performed.

Discussion:

During interviews with Contractor personnel, it was identified that an issue identified in a previous ORP assessment (i.e., the performance of safety screens prior to the resolution of Contractor-generated comments on the new or revised Engineering document, resulting in potentially inadequate safety screens) was corrected by the identification of E&NS comments as mandatory and performance of the safety screen on the final new or revised Engineering document. However, based on review of the Contractor procedure controlling the safety screening process (24590-WTP-3DP-G04T-00913, Revision 2), the assessors observed the procedure requirements were not clear on when the safety screen is performed. Neither the Contractor procedure nor the EDR form contains explicit requirements for when the safety screen is performed. In addition, the EDR process flowchart (Exhibit B of the procedure) does not discretely identify the E&NS safety screen responsibility or when it occurs in the process flow. The assessors determined this to be an assessment Observation.

A-04- ESQ-RPPWTP-009-O02 – The Contractor proposed changes to SRD Appendix C Section 21.0 that were not consistent with Appendix A, Section 6.0 of the SRD

Discussion:

The inspectors examined SE 24590-WTP-SE-ENS-04-137, Revision 0, dated September 8, 2004, "SRD Standards Changes Related to the DOE Standard 3009 Based Safety Categorization," to determine if the requirements of RL/REG-97-13, Revision 10, were followed.

SE 24590-WTP-SE-ENS-04-137, proposed changes to the SRD to be consistent with the DOE Standard 3009-based safety categorization system as implemented in facility change ABARs, 24590-WTP-SE-ENS-04-081 and 137 24590-WTP-SE-ENS-04-092. ORP reviewers identified one concern with this ABAR as follows:

- The Contractor proposed changes to SRD Appendix C Section 21.0 that were not consistent with Appendix A, Section 6.0 of the SRD. The Contractor proposed to add text that states

that raceway system for safety class (SC) circuits are not SC. The SRD states that support SSCs to SC SSCs are to be designated SC if their failures can prevent a SC SSC from performing its safety function. Raceways systems are support SSCs to SC circuits they contain. In the Contractor's SE, the basis for not considering the raceways as support system was not addressed, nor was the inconsistency with the SRD.

At the time of the assessment the Contractor initiated modifications to resolve this concern once it was brought to their attention by ORP reviewers. Additional attention to detail is warranted in ensuring that proposed changes comply with requirements or the basis for non compliance described. No response to this Observation is required as it is being addressed in the review process for ABAR 24590-WTP-SE-ENS-04-137.

A-04-ESQ-RPPWTP-009-003 – Lack of attention to safety by the team performing the SE for ABAR 24590-WTP-SE-ENS-04-008

Discussion:

The inspectors examined SE 24590-WTP-SE-ENS-04-008, Revision 0, dated April 8, 2004, "Control Strategy and Classification Changes for Pretreatment Evaporator Separator Foaming Events," to determine if the requirements of RL/REG-97-13, Revision 10, were followed.

RL/REG-97-13, Revision 10, Position 3.6 states that an amendment request submitted to ORP by means of an ABAR shall include a SE as described in Position 3.5.a. Position 3.5.a states, in part, that each such SE must determine that the change complies with all applicable laws and regulations, conforms to the SRD and provides adequate safety.

In the SE for ABAR 24590-WTP-SE-ENS-04-008, page 1 of 5, the Contractor proposed to delete the control strategy for the CNP evaporator foaming events because the Contractor successfully demonstrated that foaming in the CNP evaporator is not a credible event. During the review of the ABAR, ORP reviewers determined that events involving a sudden intrusion of air into the waste feed piping were credible and would result in High consequences to workers. The control strategies for CNP evaporator foaming were an inline radiation monitor in the condensate line of the evaporator separator vessel to shut down the feed to the evaporator separator upon detection of excessive radiation dose rate. This control strategy could under some circumstances protect against the sudden intrusion of air if the air intrusion is through the feed lines to the evaporator separator, but under other circumstances such as a failed pump housing or seal, it would not provide protection. As a result of ORP reviewer concerns, the Contractor designated the boundary below the liquid level in the CNP evaporator as safety significant (SS).

The failure of the Contractor to not identify the High consequences of an air intrusion event in the CNP evaporator and to develop corresponding control strategies is not a Finding because the ABAR did not proposed changes in this area. Nevertheless, because the air intrusion event is similar to the foaming carryover event which was the subject of the ABAR, it does demonstrate a

lack of attention to safety by the team performing the SE for this ABAR. The ABAR provided by the Contractor did not follow the requirements of RL/REG 97-13.

Because the air intrusion event is similar to the foaming carryover event which was the subject of the ABAR, it demonstrates a lack of attention to safety by the team performing the SE for this ABAR. The Contractor should put additional controls in place to insure that reviewers maintain attention to safety in areas immediately related to changes they are evaluating.

A-04-ESQ-RPPWTP-009-O04 – Did not identify weakness in PSAR during review of SE 24590-WTP-SE-ENS-04-091

Discussion:

SE 04-091 was performed to evaluate removing the air gap vessel and associated items, which were no longer in the Cesium ion-exchanger emergency elution flow path. In reviewing SE 04-091, the Pretreatment facility PSAR, and discussing the related design changes and ABAR 24590-WTP-SE-ENS-03-1144 with contractor staff, the assessors noted that the impact of eliminating the air gap vessel from the perspective of its function as a back-flow prevention design feature was not evaluated under Items 1 through 5 of the SE. It was addressed under Item 6, which asks the question: “Does the change fail to provide adequate safety?” The SE references CCN 094556 in Item 6, which indicates that a meeting was held to discuss removal of the air gap vessel. At the meeting it was determined that: “an appropriate number of ITS SS valves exits with the newly redesigned Cesium Ion Exchange Process System hydrogen mitigation bulge to provide the necessary protection against backflow events.” From discussion with Contractor personnel, the assessors determined that this safety function was not evaluated by the Contractor under other criteria in Part 1 of the SE since this safety function was not described in the PSAR. The assessors found that Attachment A of the PT facility PSAR identified the potential backflow event associated with the Cesium ion-exchangers under CSD-PCR/N0005, which describes the event as having potential SL-1 facility worker consequences. This portion of the PSAR identifies air gap vessels and isolation valves as control element strategy elements; however, these SSCs are not identified in Chapter 4 of the PSAR as ITS SSCs. The Safety Case Requirement for CSD-PCR/N0005 in the PSAR indicates that the “Radiation Protection Program” is the “credited” hazard control for this event. This administrative control does not meet SRD defense-in-depth criteria for SL-1 facility worker events (Reference SRD Appendix B, Section 3.2). Contractor personnel interviewed agreed that the Radiation Protection Program (RPP) was not the appropriate hazard control for the potential backflow/direct radiation exposure event. In the review of SE 24590-WTP-SE-ENS-04-091 and ABAR 24590-WTP-SE-ENS-03-1144, Contractor personnel should have identified that the PSAR was deficient in not identifying these SSCs in Chapter 4 of the PSAR and action should have been taken to correct the deficiency.

A-04-ESQ-RPPWTP-009-O05 – Poor implementation of Contractor’s PAAA reporting system.

Discussion:

The DOE maintains a NTS for identifying and tracking corrective actions associated with non-compliances with DOE nuclear safety requirements. The DOE uses information in the NTS as one source of information in providing oversight of DOE contractors. As an incentive for prompt non-compliance reporting and corrective action by contractors, DOE considers mitigating enforcement actions taken under 10 CFR 820 for non-compliances reported in NTS by the contractor.

The assessment team determined that on about May 12, 2004, the Contractor PAAA Coordinator Manager completed PAAA-2004-0003, which is an evaluation of 54 CARs associated with the implementation of the Contractor’s AB maintenance process that were issued over a period of two years. The evaluation concluded that non-compliances with DOE nuclear safety requirements occurred and that sufficient programmatic deficiencies existed that the condition was potentially reportable. Specifically, the condition described in PAAA-2004-0003 potentially met the “programmatic breakdown” threshold criteria described in relevant DOE guidance for reporting the condition into the NTS.

The assessment team found that the Contractor’s PAAA process procedure required that potentially reportable non-compliances be reviewed by a PRB, which consists of senior managers from various project organizations. The PRB makes recommendations to the Project Manager on whether or not to report the non-compliance. The Project Manager makes the final NTS reporting decision.

The assessment team reviewed the PRB meeting minutes (CCN 089494) and found that the PRB met on May 17, 26, and 28, 2004, to discuss PAAA-2004-0003. The PRB decided that the identified non-compliance was reportable. An action item was established by the PRB to make a written recommendation to the Project Manager regarding the NTS report by June 7, 2004.

From discussions with the PAAA Coordinator Manager and a review of e-mail messages, the assessment team found that PRB Chairman reversed his decision to report the non-compliance. The decision was based on an analysis of “procedure non-compliances” associated with the AB process with respect to time and data provided by engineering organization regarding design document conformance with AB information. The remainder of the PRB members were informed of this decision by e-mail on June 17, 2004. Based on this e-mail, the remaining PRB members that originally determined to report the non-compliance also reversed their decisions. The assessment team found that on June 21, 2004, a memorandum was written by the PRB chairman that recommended that the condition described in PAAA-2004-0003 not be reported. The Project Manager accepted this recommendation.

The assessment team considered the documents and circumstances described above and had the following observations:

- The process used by the PRB to reverse its decision on PAAA-2004-0003, which involved an e-mail request to reconsider PRB votes, is not addressed in the Contractor's PAAA process procedure. The PAAA process procedure requires that issues be considered and discussed in a meeting format, with an appropriate quorum, as part of the decision process. The process used by the PRB to reach its decision on PAAA-2004-0003 was not consistent with the Contractor's PAAA process procedure;
- As outlined above, the process for the PRB making a recommendation took from May 12 to June 21, 2004, following completion of the evaluation by the PAAA Coordinator Manager until a recommendation was made. The assessment team determined that the determination process for PAAA-2004-0003 was not timely.
- DOE guidance associated with making a determination that multiple non-compliances such as those associated with PAAA-2004-0003 indicate that sufficient programmatic weakness exists to constitute a reportable "programmatic failure" is somewhat subjective and; therefore, requires judgment and consideration of normative practices throughout the DOE complex. The assessment team performed a brief review of a number of the CARs evaluated as part of the condition described in PAAA-2004-0003. In a number of cases these CARs indicate problems with flow-down of project requirements documented in the AB, lack of staff knowledge of key aspects of the AB that affect design and procurement activities, and procedure non-compliance issues. Some of these problems resulted in significant consequences. For instance, CAR 04-007 resulted in the fabrication and installation of an ITS pressure vessel that did not meet SRD volumetric examination requirements. Based on this review, the assessment team concluded that the condition described in PAAA-2004-0003 should have been reported.
- From a review of the documentation associated with the recommendation provided in CCN 090995 and associated PRB e-mail, the assessment team concluded that the PRB's basis for reversing its original reporting decision was inadequate. The procedure compliance trend noted by the PRB is not an appropriate reason for not reporting non-compliance issues. If a reportable condition exists, it should be reported regardless of corrective actions taken. Actions taken to resolve the issue and results achieved are relevant to the corrective actions described in the NTS with respect to the reported condition. Also, the basis provided focused almost exclusively on "procedure non-compliances" and did not address a number of programmatic issues that were documented in the PRB meeting minutes (CCN 089494) or the evaluation provided in PAAA-2004-0003. The Contractor's basis for reversing its decision regarding the reportability of PAAA-2004-0003 was inadequate.

Closed

None

Discussed

None

Signatures

W. Pasciak, DOE-ORP
Assessment Team Leader

R. Griffith, DOE-RL
Senior Assessor

R. Smoter, DOE-RL Contractor
Assessor

Appendix A

Team Member Biographies

Walter J. Pasciak, Assessment Team Leader – Dr. Pasciak has been leading, participating and supervised assessments for 20 years with the DOE and the NRC. With DOE, he has reviewed many authorization basis changes proposed by the WTP Contractor. This is the third AB Maintenance assessment. Dr. Pasciak led the teams that conducted the first two assessments. Dr. Pasciak holds a baccalaureate degree in physics from New York University, a Master's in Nuclear Engineering from the Catholic University of America, and a Ph. D. in Environmental Engineering from the Johns Hopkins University. Prior to joining the DOE, Dr. Pasciak supervised inspection programs for NRC for 15 years in the areas of health physics and reactor safety.

Robert W. Griffith - Mr. Griffith has been leading and participating in nuclear safety assessments, operational readiness reviews, and facility evaluations of both DOE and commercial nuclear facilities for over 17 years. He has also lead and participated in the review of Preliminary Safety Analysis Reports and authorization basis changes for the WTP facilities and developed authorization basis changes for tank farm facilities at the Savannah River Site. Prior to his work at Hanford and Savannah River, Mr. Griffith supervised a group performing equipment environmental qualification reviews in support of several commercial nuclear reactors, provided consulting services to the site licensing group for a utility returning a nuclear reactor to service following a multi-year shutdown and facility upgrade, and performed as a systems engineer responsible for the design and construction of several systems intended for installation into the Clinch River Breeder Reactor. Mr. Griffith holds degree's in Mechanical Engineering from the University of Arizona and Stanford University.

Robert L. Smoter - Mr. Smoter has led and participated in assessments at DOE nuclear facilities and commercial nuclear power plants for over 15 years. He has participated and managed the development and review of safety analysis reports, license amendments, and unreviewed safety questions for DOE and the NRC. Mr. Smoter has been involved in the construction, startup, operation, licensing, and regulation of DOE, Navy, and commercial nuclear facilities for over 25 years.

Appendix B
Assessment Notes