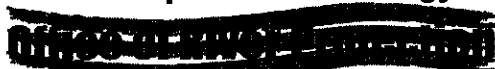




U.S. Department of Energy



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

MAY 09 2007

07-WTP-119

Mr. C. M. Albert, Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Mr. Albert:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF THE U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT NUMBER D-06-DESIGN-034: REVIEW OF BECHTEL NATIONAL, INC.'S (BNI) STANDARDS SELECTION PROCESS

ORP conducted an assessment to evaluate BNI's Standards Selection Process during the period of December 11 through December 15, 2006. For standards selection, BNI 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 to assess BNI's implementation of ISM as it pertains to standards selection. The result of the assessment is attached.

The assessment team concluded that BNI's procedures for implementing the ISM process for design changes and for authorization basis changes were adequate. The team noted that the project is currently in ISM Cycle III and concluded that BNI had properly initiated Cycle III activities in accordance with the requirements of Appendix A of the SRD.

The assessment resulted in three Findings, as documented in Section 5 of the attached Assessment Report. ORP requires BNI to provide, within 30 days of the date of the letter that transmits this report, a reply to the Findings. The reply should include: 1) admission or denial of the alleged Findings; 2) the reason for the Findings, if admitted, and if denied, the reason why; 3) the corrective steps that have been taken and the results achieved; 4) the corrective steps that will be taken to avoid further Findings; and 5) the date when full compliance with the applicable commitments will be achieved. When good cause is shown, consideration will be given to extending the requested response time.

This letter is not considered to constitute a change to the Contract. In the event the Contractor disagrees with this interpretation, it must immediately notify the Contracting Officer orally, and in writing within five working days in accordance with the Contract (Section H, Clause H.1 "Technical Direction").

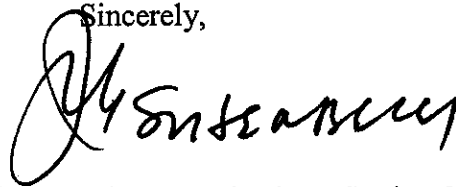
MAY 09 2007

Mr. C. M. Albert
07-WTP-119

-2-

If you have any questions, please contact me, or your staff may call Robert W. Griffith, Acting Director, WTP Project Engineering Division, (509) 372-2821.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Eschenberg". The signature is written in a cursive style with a large initial "J" and "E".

John R. Eschenberg, Project Manager
Waste Treatment and Immobilization Plant Project

WTP:KC

Attachment

cc w/attach:
W. S. Elkins, BNI
G. Shell, BNI
D. Klein, BNI
BNI Correspondence

U.S. Department of Energy, Office of River Protection

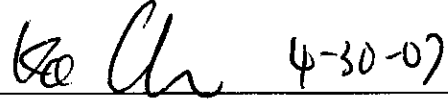
DESIGN OVERSIGHT REPORT

REVIEW BECHTEL NATIONAL, INC. STANDARDS SELECTION PROCESS

APRIL 2007

DESIGN OVERSIGHT: D-06-DESIGN-034

Team Lead:



Ko Chen
Waste Treatment and Immobilization Plant Project
Authorization Basis Team

Team Members:

Walt Pasciak
DOE Consultant
Ninu Kaushal
DOE Consultant

EXECUTIVE SUMMARY

INTRODUCTION

An Assessment Team was assembled to verify that the Waste Treatment and Immobilization Plant (WTP) Contractor (Bechtel National, Inc.) had met the contract requirements to effectively execute the program and procedures associated with the selection and implementation of WTP Project implementing codes and standards. The primary focus was to assess the Contractor's implementation of its process as it pertained to standards selection. The assessment evaluated the following areas performed by the Contractor:

- Implementation of the Integrated Safety Management (ISM) process as it related to ISM Cycle III
- Implementation of the ISM process as it related to Authorization Basis (AB) maintenance
- Implementation of the ISM process with respect to changes in plant design
- Oversight of the ISM process by the Contractor
- Adequacy of the Contractor's personnel training program to perform the ISM process.

SIGNIFICANT OBSERVATIONS AND CONCLUSIONS

The Assessment Team identified several significant observations during the course of their assessment. In addition, the team also identified two Assessment Follow-up Items (AFI) and three Findings.

- The WTP Project was currently in ISM Cycle III. This cycle will end when the Contractor completes its design work for the project. The assessors concluded that the Contractor had generally conducted the ISM Cycle III activities in accordance with project procedures and requirements of the Safety Requirements Document (SRD)¹, Appendix A.
- ISM Cycle III work was progressing in accordance with project procedures. Contractor personnel directly involved in implementing ISM Cycle III work were knowledgeable and actively engaged in identifying and resolving safety issues identified in the course of performing ISM Cycle III work. However, the assessors did identify isolated instances of failure to effectively implement the process, such as discrepancies between ISM meeting minutes and the associated safety evaluation conclusion, and missing ISM meeting minutes. The assessors also noted a lack of a project-wide procedure for the training requirements for personnel performing the ISM process. These observations are described in detail in the body of this assessment report.
- The Contractor had established adequate procedures for implementing the ISM process for design changes under 24590-WTP-GPP-SANA-002, *Hazard Analysis, Development of Hazard Control Strategies, and Identification of Standards*, and for AB changes processed under 24590-WTP-GPP-SREG-002, *Authorization Basis Maintenance*.

¹ 24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II*, Rev. 4, March 6, 2006

The Assessment Team concluded that these procedures were effective for the Contractor to implement its ISM process for design changes and AB maintenance.

- Based on the reviews performed and interviews conducted for design changes, the Assessment Team determined that changes from approved designs, including the reason for the changes, were identified, approved, documented, and controlled. Methodologies and guidelines in the American Institute of Chemical Engineers (AIChE), *Guidelines for Hazard Evaluation Procedures, Second Edition with Worked Examples*, were used to perform a structured and systematic examination of systems and components to identify potential accidents. Involved Contractor personnel were trained adequately to perform the work.
- Report 24590-WTP-RPT-ENS-03-009, *Evaluation of Facility Flooding Hazards*,” was in place during the drafting of Authorization Basis Amendment Request (ABAR) 24590-WTP-SE-ENS-04-079 and provided methodology for flooding analysis. The report stated in Section 4.2 that architectural partition walls were not considered to restrict water flows; no basis for this position was presented in the report. In preparing 24590-WTP-RPT-ENS-03-009, the Contractor failed to evaluate the basis for this assumption. This is a failure of the Contractor’s ISM process as it would be impossible to determine the need for standards for gypsum walls if an incorrect assumption is made regarding their ability to withstand a flood. This is considered a non-cited finding because, while the U.S. Department of Energy, Office of River Protection brought this issue to the Contractor’s attention, corrective actions were subsequently implemented by the Contractor. The Contractor has revised its flooding methodology and is preparing a new ABAR of flooding analysis for the WTP site. The Contractor is not required to respond to this non-cited finding.
- Several of the Contractor’s current ABAR submittals were found to lack sufficient technical information for evaluation of the ABARs. This is considered an **AFI (D-06-DESIGN-034-AFI-01)**.
- The assessors determined there was a lack of a project-wide systematically developed training program related to the ISM process for the Contractor personnel. Current training requirements for each individual in the project were arbitrarily subject to that individual’s management discretion. This practice could potentially lead to inadequate training for some participants in the ISM process, and contribute to deficiencies in the implementation of the ISM process. This training program deficiency is considered an **AFI (D-06-DESIGN-034-AFI-02)**.
- In the submittal of ABAR 24590-WTP-SE-ENS-04-0208, the Contractor described a revised design for vessels containing carbon beds. The revised design included engineering controls designated as safety significant (SS), and an engineered system that closed the isolation valves in the offgas system to suppress a fire in the vessels on detection of increased carbon monoxide. In the revised design, the water deluge capability was maintained but was controlled manually by a valve(s) located outside the offgas system room. The operator may use the bed temperature and process information, as well as the carbon monoxide detection, in making the determination to initiate the

deluge. Operating the water deluge system would cause the vessel relief valve to open, resulting in a pressurized release of chemicals from the vessel. However, in this ABAR submittal, the Contractor failed to identify the relief valve as part of the design and therefore, failed to evaluate the consequences of operating the deluge system, failed to propose necessary safety controls, and failed to identify implementing codes and standards (IC&S) for the safety control. This failure of the Contractor to fully comply with its ISM process is considered an assessment **Finding (D-06-DESIGN-034-F01)**.

- With respect to the ISM meetings, the Contractor's procedure, 24590-WTP-GPP-SANA-002, states that the results of these meetings are formally documented in accordance with Section 4.0 of the procedure and maintained as project records. However, the assessors determined the Contractor could not provide the ISM meeting minutes related to the processing of ABAR 24590-WTP-SE-ENS-05-0020. The failure of the Contractor to either conduct the ISM meeting or maintain this documentation as a project record is considered an assessment **Finding (D-06-DESIGN-034-F02)**.
- Appendix A, Section 1.0 of the SRD states that IC&S for safety class and safety significant structures, systems, and components (SSC) are specified in the SRD criteria. It also states that for additional protection class (APC) SSCs, IC&S are specified using the ISM process as described in Appendix A of the SRD, and need not be otherwise specified in the SRD, except as they are specified in Safety Criteria 4.1-2 and 4.1-3 for APC Seismic Category (SC)-II and III, and in Appendix C. The assessment identified several examples of failure to follow the requirements of Appendix A of the SRD to establish IC&S for APC SSCs in both the Low-Activity Waste (LAW) and Pretreatment (PT) Facilities. These SSCs included cascade trip interlock to C2 and C3 fans, and process area floor plugs in the LAW Facility, and the nitric acid concentration monitors and interlocks, radiation monitors on the condensers, and chilled water pressure transmitters in the PT Facility. Failure to identify IC&S for the above APC SSCs is considered an assessment **Finding (D-06-DESIGN-034-F03)**.

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	BACKGROUND	1
3.0	OBJECTIVES, SCOPE AND APPROACH.....	2
3.1	OBJECTIVE	2
3.2	SCOPE.....	2
3.3	APPROACH	2
4.0	RESULTS	2
4.1	ISM PROCESS FOR ISM CYCLE III	2
	4.1.1 Assessment Scope	2
	4.1.2 Observations and Assessments.....	3
	4.1.3 Conclusions	4
4.2	ISM PROCESS FOR AB MAINTENANCE	4
	4.2.1 Assessment Scope	4
	4.2.2 Observations and Assessment	4
	4.2.3 Conclusions	5
4.3	PERSONNEL TRAINING PROGRAM RELATED TO THE ISM PROCESS....	5
	4.3.1 Assessment Scope	5
	4.3.2 Observations and Assessment	6
	4.3.3 Conclusions	6
4.4	REVIEW OF DESIGN CHANGES AND AUTHORIZATION BASIS CHANGES ASSOCIATED WITH ABARS 24590-WTP-SE-ENS-04-079, 24590-WTP-SE-ENS-04-033, AND 24590-WTP-SE-ENS-04-100	6
	4.4.1 Assessment Scope	6
	4.4.2 Observations and Assessments.....	7
	4.4.3 Conclusions	8
4.5	REVIEW OF DESIGN CHANGES AND AB CHANGES ASSOCIATED WITH ABAR 24590-WTP-SE-ENS-04-0208	8
	4.5.1 Assessment Scope	8
	4.5.2 Observations and Assessments.....	9
	4.5.3 Conclusions	9
4.6	IMPLEMENTATION OF ISM PROCESS WITH RESPECT TO STANDARDS SELECTION IN THE SRD	9
	4.6.1 Assessment Scope	10
	4.6.2 Observations and Assessments.....	10
	4.6.3 Conclusions	12
4.7	IMPLEMENTATION OF THE ISM PROCESS WITH RESPECT TO THE ESTABLISHMENT OF IMPLEMENTING CODES AND STANDARDS FOR APC SSCS	12
	4.7.1 Assessment Scope	12
	4.7.2 Observations and Assessments.....	13
	4.7.3 Conclusions	15

4.8	OVERSIGHT OF THE ISM PROCESS BY THE CONTRACTOR	16
4.8.1	Assessment Scope	16
4.8.2	Observations and Assessments.....	16
4.8.3	Conclusions	18
4.9	CONTRACTOR'S CHANGE SCREENING PROCESS FOR POTENTIAL EFFECT ON SELECTED STANDARDS (PART I SAFETY EVALUATIONS)	18
4.9.1	Assessment Scope	18
4.9.2	Observations and Assessments.....	19
4.9.3	Conclusions	19
4.10	IMPLEMENTATION OF ISM PROCESS FOR DESIGN CHANGES NOT RESULTING IN ABARS.....	20
4.10.1	Assessment Scope	20
4.10.2	Observations and Assessments.....	20
4.10.3	Conclusions	21
5.0	SUMMARY OF FINDINGS	21
6.0	CONTRACTOR'S PERSONNEL CONTACTED.....	22
7.0	REFERENCES	23
7.1	MEETING MINUTES.....	25

Appendix A Standard Selection Process Assessment Plan

LIST OF TERMS

AB	Authorization Basis
ABAR	Authorization Basis Amendment Request
AFI	Assessment Follow-up Item
APC	additional protection class
BNI	Bechtel National, Inc.
BOF	Balance of Facilities
CCN	Correspondence Control Number
C&I	control and instrumentation
CNP	Cesium Nitric Acid Recovery Process System
CSD	Control Strategy Document
DOE	U. S. Department of Energy
E&NS	Environmental and Nuclear Safety
FEP	Waste Feed Evaporation Process System
HEPA	high-efficiency particulate air
HFP	HLW Melter Feed Process System
HLW	High-Level Waste [Facility]
HPAV	hydrogen in piping and ancillary vessel
IC&S	implementing code and standard
ISM	Integrated Safety Management
ITS	important-to-safety
LAB	Analytical Laboratory
LAW	Low-Activity Waste [Facility]
NFPA	National Fire Protection Association
NPH	natural phenomenon hazard
ORP	Office of River Protection
P&ID	piping and instrumentation diagram
PJM	pulse jet mixer
PMT	Process Management Team
PRV	pressure relief valve
PSC	Project Safety Committee
PSAR	Preliminary Safety Analysis Report
PT	Pretreatment [Facility]
RRC	risk reduction class
SC	safety class
SCR	safety case requirement
SED	Safety Evaluation for Design
SIPD	Standard Identification Process Database
SL-1, 2, 3	Severity Level -1, 2, 3
SRD	Safety Requirements Document
SS	safety significant
SSC	system, structure, and component
SC-II, III	Seismic Category -II, III
WTP	Waste Treatment and Immobilization Plant

1.0 INTRODUCTION

The U.S. Department of Energy (DOE), Office of River Protection's (ORP) mission is to retrieve and treat Hanford Site tank waste and close the tank farms to protect the Columbia River. In order to complete one major component of this mission, ORP awarded Bechtel National Inc. (BNI) a contract for the design, construction, and commissioning of the Waste Treatment and Immobilization Plant (WTP) at the Hanford Site in Richland, Washington. In order to meet WTP contract DE-AC27-01RV14136 requirements, BNI (hereinafter referred to as the Contractor) is required to develop and implement an Integrated Safety Management (ISM) program to ensure that radiological, nuclear, and process safety requirements are defined, implemented, and maintained. Related to this requirement, the Contractor is committed to establish a set of radiological, nuclear, and process safety standards and requirements.

2.0 BACKGROUND

The Contractor's Safety Requirements Document (SRD), Appendix A, "Implementing Standard for Safety Standards and Requirements Identification," described the Contractor's commitment to implement an ISM process that meets requirements of Standard 7, paragraph (e)(2)(i) of the Contract and DOE/RL-96-0004, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for the RPP Waste Treatment Plant*.

The Contractor's standards selection process is set forth in Appendix A of the SRD and in the Contractor's procedures 24590-WTP-GPP-SANA-002, *Hazard Analysis, Development of Hazard Control Strategies, and Identification of Standards*, and 24590-WTP-GPG-SANA-002, *Integrated Safety Management*. These procedures implemented the details of the Contractor's hazard analysis, accident analysis, and standards selection processes which the Contractor collectively referred to as the ISM process.

The Contractor had organized the programmatic implementation of the ISM process into "ISM Cycles" that correspond to key project milestones and DOE authorization actions. Currently, the Contractor is in the Cycle III stage. The project schedule showed the completion of ISM Cycle III was tied to the completion of detailed WTP design and the commencement of the cold-commissioning phase of the project. The Contractor indicated major accomplishments for the past two years of its ISM activities in Cycle III included the following:

- Hydrogen controls for Pretreatment (PT) and High-Level Waste (HLW) vessels (intermittent mixing)
- Hydrogen in piping and ancillary vessels (HPAV)
- Implementation of DOE-STD-3009, *Preparation Guide For U.S. Department Of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, safety reclassification
- Facility flooding analysis.

The current ISM activities will be focused on the following areas:

- Low-Activity Waste (LAW) offgas system and hydrogen generation in vessels
- Impacts to the PT and HLW C5, C3, and C2 systems due to sparging.

3.0 OBJECTIVES, SCOPE AND APPROACH

3.1 OBJECTIVE

The objective of this assessment was to verify that the Contractor has met the contract requirements to effectively execute the program and procedures associated with the selection and implementation of WTP project implementing codes and standards. The primary focus was to assess the Contractor's implementation of its process as it pertains to standards selection.

3.2 SCOPE

The scope of the assessment for the Contractor's standards selection process included the following areas:

- Implementation of the ISM process as it related to ISM Cycle III
- ISM process as it related to the authorization basis maintenance process
- Implementation of the ISM process with respect to changes in plant design
- Oversight of the ISM process by the Contractor.

3.3 APPROACH

In order to complete the assessment, the Assessment Team obtained and reviewed applicable documentation, conducted interviews, attended meetings relevant to the assessment, and documented information necessary to meet the objective of the assessment. Specifically, the team used the following approaches for the assessment:

- Verified each of the steps of the Contractor's ISM process, as described in Appendix A of the SRD, has been followed by the Contractor in its selection of standards.
- Assessed the adequacy of the Contractor's ISM process with regard to identification of hazards, evaluation of hazards, development of hazard control strategies, and selection of standards to be implemented.
- Assessed the adequacy of the Contractor's personnel training program to perform the ISM process.
- Determined if the Contractor's standards selection process has been documented in accordance with applicable Contractor procedures and assessed the adequacy of the documentation.

4.0 RESULTS

4.1 ISM PROCESS FOR ISM CYCLE III

4.1.1 Assessment Scope

The assessors met with Contractor Environment and Nuclear Safety (E&NS) personnel and reviewed documents and records pertaining to the implementation of ISM Cycle III. ISM team meeting minutes, piping and instrumentation drawings (P&ID), and the Standard Identification Process Database (SIPD) were among the documents and records reviewed to:

- Verify each step of the Contractor's ISM process, as described in Appendix A of the SRD, were followed in accordance with the Contractor's implementing procedures for ISM Cycle III.
- Assess the adequacy of the results of the ISM Cycle III with regard to the identification of hazards, evaluation of the hazards, development of hazard control strategies, and selection of standards associated with implementing hazard control strategies.
- Determine if the ISM process was being documented in accordance with applicable Contractor procedures and assess the adequacy of the documentation.

The assessors also assessed the Contractor's processing of selected Authorization Basis Amendment Requests (ABAR). This included review of the relevant information (ISM meeting minutes, safety evaluations, Project Safety Committee [PSC] meeting records, etc.) associated with those ABARs, to ensure that the Contractor's processing of ABARs was consistent with the ISM process. The selected ABARs included the following:

- ABAR-WTP-SE-ENS-04-011, *Identification of NPH Standards for the SC/SS/APC Classification Scheme*
- ABAR-WTP-SE-ENS-04-0218, *Incorporate National Fire Protection Association 69, Standard on Explosion Prevention Systems, as an Implementing Code and Standard into the Safety Requirements Document*
- ABAR-WTP-SE-ENS-04-007, *Replace IEEE 450 and IEEE 484 with IEEE 1187 and Update Revision Years for IEEE 485 and IEEE 741 in the SRD and PSAR*
- ABAR-WTP-SE-ENS-05-0020, *Tailoring of IEEE 603-1998, IEEE Standard Criteria for Safety Systems of Nuclear Power Generating Stations*
- ABAR-WTP-SE-ENS-05-0119, *Implementation of Revised Time Basis for Single Failure Criteria for Hydrogen Mitigation in Process Vessels*
- ABAR-WTP-SE-ENS-04-100, *Proposed Control for the Prevention /Mitigation of Ammonium Nitrate Deposition in the Offgas System*
- ABAR-WTP-SE-ENS-04-033, *Elimination of the Catch Tank for Molten Glass Spills*
- ABAR-WTP-SE-ENS-05-084, *Hydrogen Control for Process Vessels in the PT*

4.1.2 Observations and Assessments

The assessors reviewed the project schedule and met with Contractor personnel regarding plans associated with the ISM Cycle III. The assessors determined that the Contractor management was actively involved in planning and scheduling ISM Cycle III activities. The team also reviewed the Process Management Team (PMT) meeting minutes and determined that the PMT was providing oversight of ISM Cycle III planning and scheduling activities. The assessors verified that the PMT had taken steps to establish ISM teams. Interviews with applicable Contractor personnel indicated that appropriate resources had been allocated to conduct ISM Cycle III activities. The Contractor indicated that major accomplishments of ISM activities for the past two years included the following:

- Hydrogen controls for PT and HLW process vessels (intermittent mixing)
- HPAV
- Implementation of DOE-STD-3009 safety reclassification
- Facility flooding analysis.

Current focus of the Contractor's ISM activities included the following:

- LAW offgas system and hydrogen control in vessels
- Impacts to C5, C3, and C2 system in the PT and HLW Facilities due to sparging
- Performance of hazard topography reviews.

The assessors also performed an overall review of the Contractor's personnel training program related to the ISM process; the AB maintenance program; the processing of selected ABARs related to the design changes; the implementation of codes and standards related to additional protection class (APC) systems, structures, and components (SSC); and the screening process for potential effects on selected standards. The detailed assessment of those areas and identified instances of deficiency associated with the assessment are described in the following sections.

4.1.3 Conclusions

Although the assessors identified isolated instances of deficiency in the Contractor's execution of ISM Cycle III process, the assessors concluded that the Contractor's overall ISM Cycle III activities have generally followed the required implementing procedures and the requirements of the SRD, Appendix A. These isolated instances of deficiency are described in detail in the following sections.

4.2 ISM PROCESS FOR AB MAINTENANCE

4.2.1 Assessment Scope

The purpose of this assessment was to assess the Contractor's implementation of its ISM process for reviewing and approving changes to the AB. The assessment included the Contractor's implementation and oversight of the ISM process in connection with changes to the AB and substantial changes to the WTP design that resulted in changes to the AB using 24590-WTP-GPP-SREG-002, *Authorization Basis Maintenance*. Related to this portion of the assessment, the assessors reviewed recent changes made to 24590-WTP-GPP-SREG-002 to verify there was an appropriate linkage between the Contractor's ISM and AB maintenance processes. Recent design changes and associated AB maintenance documents were assessed regarding the Contractor's justifications and traceable records of linkages with the ISM process steps (i.e., work definition, hazard evaluation, hazard control development, and standards selection), to the extent that could be determined.

4.2.2 Observations and Assessment

24590-WTP-GPP-SREG-002 required that a safety evaluation be performed for all changes to facility or administrative controls that could affect the AB to ensure that the facility, as designed, constructed, and operated, was safe and consistent with the requirements as described in the AB. 24590-WTP-GPP-SREG-002 described the process used for the safety evaluations for both the

design and administrative changes. If the change resulted in a submittal of an ABAR to change the SRD, this required the approval of PMT and PSC Chairmen and the certification of the Contractor's project director.

Based on the review, the Assessment Team concluded that the Contractor had established adequate procedures for implementing the ISM process for AB changes processed under 24590-WTP-GPP-SREG-002. However, the assessors did identify isolated instances of deficiency in the Contractor's AB maintenance process. These instances of deficiency are described as follows:

- Based on the review of past ABAR submittals, the assessors concluded that, while progress had been made by the Contractor in the quality of its submittals, there were still instances where the Contractor's ABAR submittals lacked adequate information. Those areas include: (1) completeness and the detail in the description of the proposed design changes and (2) sufficient justification for the proposed design change. One specific example was the ABAR-WTP-SE-ENS-05-0084 submittal. In the submittal, the safety evaluation did not include the basis for the proposed change to operate intermittently pulse jet mixers (PJM) and air spargers to mitigate the hydrogen explosion in non-Newtonian vessels. That information was subsequently provided to ORP, based on a discussion with the Contractor. Another example was the lack of discussion in the safety evaluation on why Newtonian vessels with high solids content (>2% wt.) require PJMs as a prevention control strategy for hydrogen explosion hazard while Newtonian vessels with low solids contents do not. Again, this information was provided subsequently. This lack of sufficient technical information in the Contractor's ABAR submittal is considered an **Assessment Follow-Up Item (AFI) (D-06-DESIGN-034-AFI-01)**.
- In the ISM meeting minutes associated with ABAR 24590-WTP-SE-ENS-05-0084 (CCN:116906), safety classification of the air purge system to prevent hydrogen explosion in spent resin slurry vessels (RDP-VSL-00002A/B/C), was designated as APC/ Seismic Category (SC)-III. However, the same system was designated as safety significant (SS)/SC-III in the safety evaluation because of the unexpected case of transferring poorly eluated resin into these vessels. The assessors determined that this isolated case of discrepancy between the ISM meeting minutes and the associated safety evaluation was not a finding because safety was not diminished due to adoption of more conservative design.

4.2.3 Conclusions

Although the assessors observed isolated instances of deficiency as noted above, the team concluded, in general, that the Contractor had adequately followed the procedures for implementing the ISM process for AB changes processed under 24590-WTP-GPP-SREG-002.

4.3 PERSONNEL TRAINING PROGRAM RELATED TO THE ISM PROCESS

4.3.1 Assessment Scope

The assessors assessed the adequacy of the Contract's personnel training program to perform the ISM process.

4.3.2 Observations and Assessment

The Assessment Team performed a detailed review of training records of a selected group of Contractor's personnel to determine if the Contractor personnel involved in the standards selection are suitably qualified and experienced for the assignment such that they brought appropriate engineering judgment and prior experience to the decision process. The training records related to the ISM process, reviewed by the team, included personnel in different disciplines such as E&NS, Engineering, and Operation. As expected, the assessors observed that personnel in the E&NS organization had the most extensive training related to the ISM process, while personnel in other disciplines (Engineering and Operation) had less. The assessors also observed that there was no systematic project-wide training guide related to the ISM process. In other words, the training required for the ISM process for each individual was made on the discretion of that individual's management. Therefore, different people may have different training requirements even if they were in the same job category. This lack of clear, project-wide guidelines or programs for required training related to the ISM process may result in inadequate training for some participants in the ISM process and could contribute to deficiencies in the deliberation of the ISM process.

4.3.3 Conclusions

The assessors determined that there was a lack of a project-wide systematically developed training program related to the ISM process for Contractor personnel. Current training requirement for each individual in the project was arbitrarily subject to that individual's management discretion. This practice could potentially lead to inadequate training for some participants in the ISM process and contribute to deficiencies in the deliberation of the ISM process. This training program deficiency is considered an AFI (D-06-DESIGN-034-AFI-02).

4.4 REVIEW OF DESIGN CHANGES AND AUTHORIZATION BASIS CHANGES ASSOCIATED WITH ABARS 24590-WTP-SE-ENS-04-079, 24590-WTP-SE-ENS-04-033, AND 24590-WTP-SE-ENS-04-100

In this portion of the assessment, the Assessment Team reviewed ABARs 24590-WTP-SE-ENS-04-079, *New Control Strategy Due to PT Internal Flooding*; ABAR 24590-WTP-SE-ENS-04-033, *Elimination of the Catch Tank for Molten Glass Spills*; and ABAR 24590-WTP-SE-ENS-04-100, *Proposed Control for the Prevention/Mitigation of Ammonium Nitrate Deposition in the Offgas System*.

4.4.1 Assessment Scope

The assessors interviewed Contractor Engineering and E&NS personnel and reviewed documents/records pertaining to the processing of the listed ABARs. ISM Team meeting minutes and safety evaluations were among the documents/records reviewed to:

- Verify the steps of the Contractor's ISM process, as described in SRD Appendix A, were being accomplished in accordance with the Contractor's implementing procedures as appropriate for the design change.
- Assess the adequacy of the results of the ISM.

- Determine if the ISM process was being documented in accordance with applicable Contractor procedures and assess the adequacy of the documentation.

4.4.2 Observations and Assessments

Assessment of processing of ABAR 24590-WTP-SE-ENS-04-079

The new control strategy identified in the ABAR consisted of an air gap in an existing transfer tube (Transfer Tube 1) in the floor of the PT Facility building at 28 ft elevation, room P-0223. The air gap is designed to facilitate drainage to ensure that the water level does not reach a height exceeding the floor live load limit for the room. The assessors reviewed calculation 24590-PTF-UOC-10-00002, which provided the flooding evaluation for the PT Facility. While the calculation supported the change presented in the ABAR, the calculation was deficient in that it was based on an unsupported assumption that, if incorrect, negated the conclusions of the calculation. The unsupported assumption was that gypsum walls could be neglected in the analysis because water is assumed to flow through gypsum walls unimpeded, and as a result all zones adjacent to stairwells, chases, or lower elevation rooms separated only by gypsum walls could be neglected in the analysis. The Contractor did not provide a basis for this assumption. Discussions with Contractor staff subsequent to the submission of the ABAR revealed that the Contractor did not have a basis for its assumption.

Note that the Contractor's report 24590-WTP-RPT-ENS-03-009, *Evaluation of Facility Flooding Hazards*, was in place during the drafting of ABAR 24590-WTP-SE-ENS-04-079 and provided the methodology that was used in the flooding analysis associated with the ABAR. The report, dated September 16, 2003, stated in Section 4.2, that architectural partition walls were not considered to restrict flows; no basis for this position was presented in the report. Discussion with Contractor staff revealed that this position was a professional judgment decision. Subsequently, procedure 24590-WTP-GPG-SANA-002, *Integrated Safety Management*, was developed. Appendix A in this procedure adopted the text of 24590-WTP-RPT-ENS-03-009. On August 31, 2006, procedure 24590-WTP-GPG-SANA-002 was revised with the new position that "architectural partition walls are considered obstructions that restrict flow." In preparing 24590-WTP-RPT-ENS-03-009, the Contractor failed to evaluate the basis for the assumption that architectural partition walls constructed of gypsum were not considered to restrict flows. This is a failure of the Contractor's ISM process² as it is impossible to determine the need for standards for gypsum walls if an incorrect assumption is made regarding their ability to withstand a flood. Subsequent to the submittal of the ABAR, as a result of discussions between the Contractor and ORP staff, the Contractor revised its position on the ability of architectural partition walls to restrict flow and is in the process of revising the flooding analysis for all facilities. Because corrective actions are being implemented, this is not considered an assessment Finding. The Contractor is not required to respond to this assessment observation.

² Note that Standard 7, Paragraph (e)(2)(i) of Contract No. DE-AC27-01RV14136 between the U.S. DOE and BNI requires the Contractor to develop and implement a program to ensure that radiological, nuclear, and process safety requirements are defined, implemented and maintained. The Contractor's SRD, Appendix A, describes the Contractor's commitment to implement an integrated safety management (ISM) process that meets the contractual requirements. The Contractor's procedure 24590-WTP-GPP-SANA-002 implements the requirements described above.

Assessment of processing ABARs 24590-WTP-SE-ENS-04-033 and -04-100

ABAR 24590-WTP-SE-ENS-04-033 pertained to elimination of the catch tank as a barrier for mitigating the molten glass spills in the HLW Facility. The proposed design change was considered at the recommendation of the Requirements Implementation Assessment Team (RIAT). The assessors noted that ISM meetings to review the molten glass spill event were held on January 23 and April 8, 2004. These meetings included participants from the Contractor's relevant organizations (E&NS; Melter System and Process Engineering; Control and Instrumentation). While there was no detailed record of the deliberations in the meeting, the meeting record did include a checklist used in the deliberations to comply with 24590-WTP-GPG-SANA-002 requirements. The meeting record included the resulting changes to the SIPD molten glass spill event elements.

ABAR 24590-WTP-SE-ENS-04-100 pertained to proposed controls for prevention/mitigation of ammonium nitrate deposition in the offgas system. Evaluation of the potential for ammonium nitrate deposition in the LAW offgas system, and implementation of control strategies to address this concern were part of the condition of acceptance of the LAW Preliminary Safety Analysis Report (PSAR) Update. The Contractor held a series of five meetings between June 9 and June 17, 2004. These meetings had adequate representation from various disciplines/departments. The ISM process identified controls to prevent blocking of the melter offgas flow path with ammonium nitrate and explosions that could breach the offgas piping. The resulting set of SIPD records adequately described the events that could lead to offgas system blockage or rupture caused by an explosion.

4.4.3 Conclusions

The assessors concluded that, in the case of the unsupported assumption that water flows unimpeded through gypsum walls and as a result all zones adjacent to stairwells, chases, or lower elevation rooms separated only by gypsum walls can be neglected in the analysis, the Contractor did not provide a basis for this assumption in the report supporting the calculation. Consequently, it was impossible to determine the need for the selection of standards for gypsum walls, and it represented an inadequate application of the ISM process. This is considered a non-cited assessment Finding because the Contractor had already initiated a corrective action to revise its flooding methodology.

In the Contractor's processing of ABARs 24590-WTP-SE-ENS-04-033 and 04-100, the assessors concluded that the Contractor had adequately implemented the ISM process.

4.5 REVIEW OF DESIGN CHANGES AND AB CHANGES ASSOCIATED WITH ABAR 24590-WTP-SE-ENS-04-0208

In this portion of the assessment, the Assessment Team reviewed ABAR 24590-WTP-SE-ENS-04-0208, *Offgas Release and Fire Events ABAR for 3009 Implementation*.

4.5.1 Assessment Scope

The assessors interviewed Contractor Engineering and E&NS personnel and reviewed documents/records pertaining to the new control strategies for carbon bed fire protection described in ABAR 24590-WTP-SE-ENS-04-0208. Carbon bed fire protection is only one of the

areas addressed in this ABAR. ISM Team meeting minutes and the ABAR safety evaluation were among the documents/records reviewed to:

- Verify the steps of the Contractor's ISM process, as described in SRD Appendix A, were being accomplished in accordance with the Contractor's implementing procedures as appropriate for the design change.
- Assess the adequacy of the results of the ISM.
- Determine if the ISM process was being documented in accordance with applicable Contractor procedures and assess the adequacy of the documentation.

4.5.2 Observations and Assessments

The new control strategy identified in the ABAR was as follows:

“Originally, the fire suppression system activated the water deluge based on carbon monoxide detection and the isolation valves in the offgas system were to control the water added during the deluge. The revised design has SS controls and an engineered system that closes the isolation valves on detection of increased carbon monoxide and suppresses the fire. In the revised design, the water deluge capability was still maintained but it was controlled manually by a valve(s) located outside the offgas room. The operator may use the bed temperature and process information, as well as the carbon monoxide detection, in making the determination to initiate the deluge.”

However, in the submittal of ABAR 24590-WTP-SE-ENS-04-0208, the Contractor failed to identify the relief valve as part of the design, and therefore failed to evaluate the consequences of operating the water deluge system, which could result in a pressurized release of chemicals from the vessels.

4.5.3 Conclusions

The assessors concluded that failure to evaluate the consequences of operating the deluge system, to propose necessary safety controls, and to identify implementing codes and standards (IC&S) for the safety controls is a failure of the Contractor's ISM process. This is considered an assessment **Finding (D-O6-DESIGN-034-F01)**.

4.6 IMPLEMENTATION OF ISM PROCESS WITH RESPECT TO STANDARDS SELECTION IN THE SRD

This portion of the assessment assessed the Contractor's implementation of the ISM process related to the standards selection in the SRD. The Assessment Team reviewed ABARs 24590-WTP-SE-ENS-04-0218, *Incorporate National Fire Protection Association 69, Standard on Explosion Prevention Systems, as an Implementing Code and Standard into the Safety Requirements Document*; 24590-WTP-SE-ENS-04-011, *Identification of NPH Standards for the SC/SS/APC Classification Scheme*; 24590-WTP-SE-ENS-04-007, *Replace Institute of Electronic and Electrical Engineers (IEEE) 450 and IEEE 484 with IEEE 1187 and Update the Revision Years of IEEE 485 and IEEE 741 in the SRD and PSARs*; and 24590-WTP-SE-ENS-05-0020, *Tailoring of IEEE 603-1998, IEEE Standard Criteria for Safety Systems for Nuclear Power*

Generating Stations. All these ABARs were associated with changes to the SRD implementing codes and standards.

4.6.1 Assessment Scope

The reviewers examined documents/records pertaining to the incorporation of National Fire Protection Association (NFPA) 69, *Standard on Explosion Prevention Systems*, DOE-STD-1021, *Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components*, and IEEE 1187, *IEEE Recommended Practice for Installation Design and Installation of Valve Regulated Lead-Acid Storage Batteries for Stationary Applications*, as new SRD implementing standards, as proposed in ABARs 24590-WTP-SE-ENS-04-0218, 24590-WTP-SE-ENS-04-011, and 24590-WTP-SE-ENS-04-007, respectively. The reviewers also examined documents/records pertaining to tailoring of IEEE 603-1998, *IEEE Standard Criteria for Safety Systems for Nuclear Powergenerating Stations*, as proposed in ABAR 24590-WTP-SE-ENS-05-0020. ISM team meeting minutes and safety evaluations were among the documents/records reviewed to:

- Verify the steps of the Contractor's ISM process, as described in SRD Appendix A, were being accomplished in accordance with the Contractor's implementing procedures as appropriate for the design change.
- Assess the adequacy of the results of the ISM.
- Determine if the ISM process was being documented in accordance with applicable Contractor procedures and assess the adequacy of the documentation.

4.6.2 Observations and Assessments

Background

ABAR 24590-WTP-SE-ENS-04-0218 proposed adding NFPA 69 to the SRD Safety Criterion 4.1-2 and Appendix C to address explosion prevention in process vessels, ancillary vessels, and cesium ion exchange columns. In addition, NFPA 69 had been tailored for application to these systems. The ISM team meeting for tailoring NFPA 69 was documented in CCN: 128466, as amended by the BNI PMT (CCN: 136184).

ABAR 24590-WTP-SE-ENS-04-011 proposed adding DOE-STD-1021 to the SRD Safety Criterion 4.1-3 to address emergency handling, hazard recovery, fire suppression, emergency preparedness, communication, and power systems that may be needed to preserve the health and safety of workers and visitors during a natural phenomenon hazards (NPH) event.

Both ABARs 24590-WTP-SE-ENS-04-007 and 24590-WTP-SE-ENS-05-0020 proposed adding new IEEE standards to the SRD.

Assessment of the ISM process to the SRD change

1. Assessment of standards selection process related to ABAR 24590 WTP-SE-ENS-04-0218

The assessors examined the positions taken in BNI CCN: 128466 regarding tailoring of NFPA 69. Subsequent to CCN: 128466, a second ISM meeting was held and documented in

CCN: 136184. The second meeting was by line technical managers to review and comment on the positions taken in the earlier meeting. In several cases, the second meeting revised the positions taken in the earlier meeting. Generally, a basis was provided for positions that were revised in the second meeting. The assessors determined that the items identified in the CCNs were consistent with what was described in the ABAR. The assessors concluded that the ISM meetings were effective in tailoring the standard and followed the Contractor's ISM process.

The assessors observed that an inconsistency in the extent of justification that was provided in meeting minutes contained in CCNs 128466 and 136184. In general, CCN: 128466 provided more justifications for its positions than did CCN: 136184, but for both CCNs, there were cases where justifications were not provided. The assessors reviewed procedures 24590-WTP-GPG-SANA-002, 24590-WTP-GPP-SREG-002, and 24590-WTP-GPP-SANA-003, *Standards Identification Process Database*. The assessors concluded that these procedures did not contain guidance as to the extent of justification that should be provided for positions taken in ISM meetings or positions documented in meeting minutes. This is considered an assessment non-cited Finding because the Contractor did not violate its ISM procedures.

2. Assessment of the standards selection process related to ABAR 24590-WTP-SE-ENS-04-011

The assessors performed a detailed review of the relevant information associated with ABAR 24590-WTP-SE-ENS-04-011. The information included ISM meeting minutes (CCN: 097910), PSC meeting records, and the safety evaluation. These records provided the technical justification for adding DOE-STD-1021 to the SRD Safety Criterion 4.1-3, and the subject was extensively discussed among the ISM participants. Based on the review of the information, the assessors concluded that the process for the addition of DOE-STD-1021 to the SRD had followed the Contractor's procedures.

3. Assessment of the standards selection process related to ABARs 24590-WTP-SE-ENS-04-007 and 24590-WTP-SE-ENS-05-0020

The assessors noted that the PMT was appropriately involved in establishing the ISM teams and approving the results of the ISM team process. An ISM meeting was held and appropriately recorded for discussing the changes proposed in 24590-WTP-SE-ENS-04-007. The PSC involvement and oversight for the ABAR was also evident from the PSC meeting minutes. The PSC meeting minutes showed that the PSC provided adequate oversight and approval of the ABAR, prior to the transmittal of the ABAR to DOE.

However, for 24590-WTP-SE-ENS-05-0020, the assessors noted that, although the PMT approved the establishment of an ISM team and subsequently approved the outcome of the ISM team in the form of a proposed ABAR, no record of the ISM team meeting in the form of meeting minutes could be located in the document base. The assessors asked the Contractor to provide a copy of these meeting minutes. The Contractor responded that there was a record of the subject ISM team meeting being scheduled, but the meeting minutes could not be found.

The Contractor's procedure 24590-WTP-GPG-SANA-002 states with respect to the ISM meetings:

“The results of these meetings are formally documented in accordance with Section 4.0 and maintained as project records.”

Contrary to these requirements, the Contractor failed to formally document the ISM team meeting minutes related to ABAR 24590-WTP-SE-ENS-05-0020 or failed to maintain this documentation as project records.

4.6.3 Conclusions

The assessors concluded that, in the case of SRD changes made in association with ABAR 24590-WTP-SE-ENS-04-0218, the Contractor’s process for making this change to the SRD was effective in tailoring NFPA 69, and followed the Contractor’s ISM process. The assessors also concluded that the Contractor did not develop procedural guidance to provide ISM team members clarification as to the extent of justification that should be documented in meeting minutes for positions taken in ISM meetings. This is considered an assessment non-cited Finding because the Contractor did not violate its ISM procedures.

The assessors concluded that the addition of a new standard, DOE-STD-1021, to the SRD through ABAR 24590-WTP-SE-ENS-04-011 had followed the proper procedure and requirements.

The assessors concluded that the Contractor’s implementation of the ISM process for standards selection resulting in SRD changes from ABARs 24590-WTP-SE-ENS-04-007 and 05-0020, was adequate except for consistently recording the ISM team meeting minutes or maintaining the minutes as project records. This deficiency is considered an assessment **Finding (D-06-DESIGN-034-F02)**.

4.7 IMPLEMENTATION OF THE ISM PROCESS WITH RESPECT TO THE ESTABLISHMENT OF IMPLEMENTING CODES AND STANDARDS FOR APC SSCS

4.7.1 Assessment Scope

The assessors reviewed documentation for the HLW, LAW, and PT Facilities, Analytical Laboratory (LAB), and Balance of Facilities (BOF) associated with APC SSCs to determine if the requirements of the SRD, Appendix A were being implemented for the selection of IC&S. The documentation reviewed consisted of several ABARs, their associated safety evaluations and the ISM meeting minutes listed in the ABARs. Specifically, ISM meeting minutes reviewed were as follows: for ABAR 24590-WTP-SE-ENS-04-090, CCNs 075292, 053803, 087823, and 088710; for ABAR 24590-WTP-SE-ENS-03-187, CCN: 085334; for ABAR 24590-WTP-SE-ENS-04-038, CCNs 089940, 099681, 102931, and 104144; and for ABAR 24590-WTP-SE-ENS-04-008, CCNs 075836 and 077381. A complete list of CCNs is provided in Section 7.1.

Also, several CCNs were reviewed that were not associated with any particular ABAR; i.e., CCNs 094178, 057503, 079598, 107622, 129122, 083754, 098522, and 069922. Also, the assessors interviewed Contractor Engineering and E&NS personnel involved in the preparation of the meeting minutes.

4.7.2 Observations and Assessments

Background

Appendix A, Section 1.0, of the SRD states that IC&S for safety class (SC) and SS SSCs are specified in the SRD safety criteria. It also states that for APC SSCs, IC&S are specified using the ISM process described in Appendix A, and need not be otherwise specified in the SRD, except as they are specified in Safety Criteria 4.1-2 and 4.1-3 for APC SC-II and III items, and in Appendix C. The team reviewed procedures 24590-WTP-GPG-SANA-002, 24590-WTP-GPP-SREG-002, and 24590-WTP-GPP-SANA-003 to determine if there was appropriate guidance for ISM team members as to how the requirements in the SRD, Appendix A, are to be implemented to identify and document IC&S for APC SSCs.

Assessment of the ISM process for the selection of IC&S for specific APC SSCs

Low-Activity Waste (LAW) Facility:

In ABAR 24590-WTP-SE-ENS-04-038, the assessors reviewed four new APC items to determine if IC&S were selected: (1) C5 cascade trip interlock to the C2 and C3 fans, (2) three LAW cranes, (3) process area floor plugs, and (4) LAW platforms located in the wet process cells and melter gallery. CCN: 104144 provided a listing of the IC&S for the three LAW cranes. CCN: 057503 provided the standards for the C5 cascade trip interlock when it was designated as risk reduction class (RRC). However, the assessors found no evidence of an ISM evaluation that the same or any other IC&S would apply when the C5 interlock classification was changed from RRC to APC. This item was not listed in the summary table in CCN: 104144. Regarding the process area floor plugs and LAW platforms, the referenced CCNs did not identify the standards for these APC SSCs; however, the SRD requires that for APC items that are Seismic Category (SC) II or III for NPH protection, SRD IC&S for Safety Criteria 4.1-2 and 4.1-3 apply. For the case of the process area floor plugs and LAW platforms, Table 3A-7 of the LAW PSAR specifically listed these items as SC-III items. Accordingly, SRD IC&S for Safety Criteria 4.1-2 and 4.1-3 apply. Under the column in the table of CCN: 104144 entitled "LAW Standards Selection/Confirmation" the statement "no direct reference to applicable standards in current SRD" was made. This was incorrect because seismic standards in Safety Criteria 4.1-2 and 4.1-3 apply. Other than the listings for the three LAW cranes, the assessors were not able to find discussion of these IC&Ss in the ISM meeting minutes.

For the case of the C5 cascade trip interlock to the C2 and C3 fans, this item had been designated as RRC and standards had been selected by the Contractor. In converting this system to APC, the Contractor did not determine if the RRC standards apply to the item under the new APC designation. Also, for the case of the process area floor plugs and LAW platforms located in the wet process cells and melter gallery, the Contractor did not designate the applicable implementing codes and standards in its ISM documentation. The current designation in CCN: 104144 was incorrect because the applicable standards were contained in the SRD as described above. This is considered an assessment Finding because the Contractor failed to identify the implementing codes and standards for APC SSCs per SRD Appendix A (D-06-DESIGN-034-F03).

High-Level Waste (HLW) Facility:

In ABAR 24590-WTP-SE-ENS-04-090, the assessors reviewed one new APC item to determine if IC&S were selected, the addition of HLW Melter Feed Process System (HFP) vessel mechanical agitators. While the IC&S were not discussed in the meeting minutes associated with the ABAR, a standards selection consolidation ISM meeting was held by the Contractor to address IC&S for several safety case requirements (SCR) and was documented in CCN: 094178. Standards for the HFP vessel mechanical agitators are contained on page 9 under SCR-HMECH/N0030 in CCN: 094178. CCN: 094178 provided a detailed listing of selected IC&S for SCRs for the HLW Facility. The table provided IC&S for APC SSCs and included justifications. The reviewers concluded that the design of the HLW Facility has followed the requirements of Appendix A of the SRD in selecting standards for APC SSCs.

Pretreatment (PT) Facility:

In ABAR 24590-WTP-SE-ENS-04-008, the assessors reviewed one new APC item to determine if IC&S were selected. The item was the addition of Waste Feed Evaporation Process System (FEP) evaporator separator primary condenser process condensate radiation monitors and diversion valves. The team reviewed CCNs 075836 and 077381, which were referenced in the ABAR, and found no mention of standards for APC items. CCN: 079598 documented an ISM meeting held to identify standards for control and instrumentation (C&I) components in the vessel overflow control strategy, which included the FEP evaporator separator primary condenser process condensate radiation monitors and diversion valves contained in the ABAR. There was a table at the back of the ABAR that provided a listing of applicable standards for each safety function considered. There were eight APC safety functions listed in the table. In each of the eight cases, the seismic IC&S was provided; for two cases, in addition to the seismic IC&S, one other IC&S was designated. Six of the cases had no other standards listed: (1) the local horn and light associated with the treated LAW concentrate storage vessel gamma monitor and interlocks; (2) the nitric acid concentration monitors and interlocks; (3) the emergency elution tank levels; (4) the FEP evaporator/separator shutdown radiation monitors on the condensers; (5) the FEP and Cesium Nitric Acid Recovery Process System (CNP) evaporator separator reboiler radiation monitor; and (6) the chilled water pressure transmitter. All of these items required the identification of IC&S for their electrical aspects and some possibly required the IC&S for their mechanical characteristics. Failure to identify IC&S for the above safety functions is considered an assessment Finding against SRD requirements to use Appendix A to identify APC SSC IC&S (D-06-DESIGN-034-F03).

In ABAR 24590-WTP-SE-ENS-03-187, the assessors reviewed one new APC item to determine if IC&S were selected. The item was the addition of cranes and lifting devices to the APC table. The team reviewed CCN: 085334 and found that the document acknowledged that since the cranes and lifting devices had a higher important-to-safety (ITS) designation, the existing IC&S no longer applied. The document also stated that a follow-up ISM meeting would be held to identify the standards. CCNs 107622 and 129122 identified the IC&S for cranes and lifting devices addressed in ABAR 24590-WTP-SE-ENS-03-187. The Contractor adequately identified IC&S for the APC cranes addressed in the ABAR.

Analytical Laboratory (LAB):

The team reviewed documentation associated with three APC SSCs identified in Table 3A-6 of the LAB PSAR. The SSCs were: (1) C5 ventilation fans; (2) backflow preventors; and (3) C5 ventilation controls. The team reviewed CCN: 083754 and concluded that the IC&S for the above SSCs were all contained in the tables. The tables provided the SSCs for all the safety functions in the facility.

Balance of Facilities (BOF):

The assessors reviewed documentation associated with three APC SSCs identified in Table 3A-5 of the BOF PSAR. The SSCs were: (1) normal power components that prevent internal power failures from activating the ITS emergency power system; (2) autosampling pneumatic transfer tracking system; and (3) ammonia vessel pressure relief devices. The assessors reviewed CCN: 069922, "BOF RRC Component Identification and Standards Confirmation," CCN: 098522, "ISM for BOF Conversion to DOE-STD-3009 Classifications, and Standards Confirmation," and CCN: 102890, "ISM III – Review of SIPD entries for ASX components and QA qualifications."

Regarding the normal power components that prevent internal power failures from activating the ITS emergency power system, the Contractor's ISM meeting minutes (CCN: 098522) for BOF conversion to DOE-STD-3009 classifications referred to CCN: 069922. CCN: 069922 provided IC&S for RRC components including the electrical standards for normal power components that prevent internal power failures from activating the ITS emergency power system. As a result, the Contractor provided IC&S for this APC SSC. Regarding the autosampling pneumatic transfer tracking system, the Contractor's ISM meeting minutes (CCN: 102890) stated that the "manufacturer's existing commercial practices provided adequate quality based on the currently available design information." The SRD, Appendix A requires that standards be identified for APC SSCs. The assessors considered that if the Contractor conclude that the manufacturer's standards are acceptable, those standards are required to be identified in the documentation associated with the ISM meeting. The Contractor's statement in the meeting minutes does not provide that information. This is considered an assessment Finding because the Contractor failed to identify implementing codes and standards for APC SSCs per SRD Appendix A (D-06-DESIGN-034-F03).

Regarding the ammonia vessel pressure relief devices, these items are classified as SS for the confinement boundary function. Overpressure relief from the vessels through the pressure relief valve (PRV) could result in an SS release of ammonia. Therefore, the ISM team selected preventive controls as SS so that a release through the PRVs would be prevented. The ISM team also recognized that the PRVs would act to protect the vessel from large-scale failure should the SS preventive controls fail, and therefore the relief function was designated as APC. No separate APC designation of IC&S for the PRVs was necessary as they were covered as SS IC&S.

4.7.3 Conclusions

The assessors reviewed procedures 24590-WTP-GPG-SANA-002, 24590-WTP-GPP-SREG-002, and 24590-WTP-GPP-SANA-003, and concluded that these procedures did not

contain guidance as to how ISM teams should implement Appendix A of the SRD for selection and documentation of standards for APC SSCs.

For the case of the C5 cascade trip interlock to the C2 and C3 fans in the LAW Facility, the Contractor was required to identify applicable IC&S when these items were reclassified from RRC to APC. Also, for the case of the process area floor plugs and LAW platforms located in the wet process cells and melter gallery, the Contractor was required to identify the applicable IC&S in its ISM documentation. The IC&Ss specified in CCN: 104144 were incorrect because the applicable standards were contained in the SRD as described above. This is considered an assessment Finding against SRD requirements to use Appendix A to identify APC SSC IC&S (**D-06-DESIGN-034-F03**).

Also, CCN: 079598 documents an ISM meeting held to identify standards for C&I components in the vessel overflow control strategy for the PT Facility. Six of the eight APC control strategies listed in CCN: 079598 did not provide a complete set of IC&S. These are (1) the local horn and light associated with the treated LAW concentrate storage vessel gamma monitor and interlocks; (2) the nitric acid concentration monitors and interlocks; (3) the emergency elution tank levels; (4) the FEP evaporator/separator shutdown radiation monitors on the condensers; (5) the FEP and CNP evaporator separator reboiler radiation monitor; and (6) the chilled water pressure transmitter. All of these items required the identification of IC&S for their electrical aspects, and some may require IC&S for their mechanical characteristics. Failure to identify IC&S for the above safety functions is considered an assessment Finding against SRD requirements to use Appendix A to identify APC SSC IC&S (**D-06-DESIGN-034-F03**).

In summary, the assessors found that there was a lack of procedural guidance on implementation of the SRD Appendix A requirements on identification of IS&S for APC SSCs. Also, the SRD, Appendix A requirements for identifying APC IC&S were not implemented consistently among the facilities and among different APC SSCs.

4.8 OVERSIGHT OF THE ISM PROCESS BY THE CONTRACTOR

4.8.1 Assessment Scope

The assessors reviewed procedures 24590-WTP-GPP-SREG-001, *Project Safety Committee*, and 24590-WTP-GPP-SREG-007, *Process Management Team*, to verify oversight responsibilities of those committees in the ISM process. The assessors then reviewed PMT and PSC meeting minutes to verify the Contractor had implemented these oversight requirements. The assessors also reviewed several management self-assessments of the SIPD.

4.8.2 Observations and Assessments

The assessors reviewed minutes of several PMT meetings: CCN: 072709, "Process Management Team #93 Meeting," CCN: 081957, "Process Management Team #98 Meeting," and CCN: 105722, "Process Management Team #119 Meeting." In all cases reviewed, it was noted that the PMT team was actively involved in establishing appropriate ISM teams, technical oversight of the ISM meeting results, and approval of the proposed ABARs for submittal to the PSC in accordance with the PMT responsibilities in 24590-WTP-GPP-SREG-007 and the Contractor's procedure for identification of standards (24590-WTP-GPP-SANA-002).

The assessors also reviewed minutes of several PSC meetings: CCN: 088269, "110th Project Safety Committee Meeting," CCN: 088276, "115th Project Safety Committee Meeting," and CCN: 128473, "140th Project Safety Committee Meeting." In all cases reviewed, the assessors noted that the PSC provided oversight of the ISM process in accordance with the PSC responsibilities per 24590-WTP-GPP-SREG-001 and provided independent review and approval for ABARs that resulted in changes to the SRD.

The assessors also reviewed the following reports of Contractor's self-assessments of the SIPD:

- 24590-WTP-MAR-ENS-04-0001, *Evaluation of SIPD Record Approval Process*, Rev. 0
- 24590-WTP-MAR-ENS-04-0022, *Evaluation of SIPD Record Adequacy*, Rev. 0
- 24590-WTP-MAR-ENS-05-0014, *SIPD Record Quality Management Assessment*, Rev. 0
- 24590-WTP-MAR-ENS-06-0014, *Assessment of the Adequacy of Records in the Standards Identification Process Database*, Rev. 0

24590-WTP-MAR-ENS-04-0001 addressed the approval process for SIPD records and covered an evaluation of all SIPD records from November 14, 2003, through March 10, 2004. A total of 55 Control Strategy Document (CSD) records and 48 SCR records were reviewed. The assessors found this self-assessment of SIPD records by the Contractor to be adequate. The Contractor found all approved SIPD records to be complete and internally self-consistent. A few discrepancies in the SIPD record approval process were found, and corrective action items were identified and assigned to responsible personnel. The assessors verified that there was appropriate follow-up action on the corrective action item and that it had subsequently been closed.

Contractor's SIPD assessment MAR-04-0022 was conducted in early August 2004. For this assessment, the Contractor focused on approved "high consequence" records with associated consequences as follows:

- Chemical consequences for public or co-located worker of above threshold (AT)
- Radiological consequences to the co-located worker of Severity Level (SL)-1
- Radiological consequences to the public of SL-1 or 2

Out of a total 303 records identified with these characteristics, the Contractor selected a sample size of 10%t from each facility for review. Out of the sample selected for review, five potentially significant comments were identified. Action items were assigned for these to responsible personnel. The corrective action items were entered into a database and corrective action was taken to close the items. The assessors also made a random check on the follow-up action on two of the resulting significant comments and found that the actions to close the items were appropriate.

The assessors found the methodology and the conduct of this self-assessment to be appropriate.

Contractor's SIPD Assessment MAR-05-0014 was conducted in May and June 2005. In this assessment, the Contractor evaluated the SIPD records for CSD record completeness, design feature identification, and issuance of complete control strategies for WTP facilities. 2,054 SIPD-approved CSD records were reviewed for completeness. 747 SIPD SCR records were

reviewed to identify SCRs that have “design feature” in the SCR. These SCR records were evaluated to check whether the “design features” were appropriately identified per 24590-WTP-GPP-SANA-002. Selected systems were reviewed to determine if the complete control strategies were being issued to PDC per 24590-WTP-GPP-SANA-003.

The Contractor’s assessment found that out of the 2,054 records reviewed, 65 CSD records were marked as deleted records, the remaining 1,989 records were appropriately complete per 24590-WTP-GPP-SANA-002. Out of the 754 SCR records, 94 had “design feature” in the description, but in all but three SCR records, the “design feature” designation was considered by the Contractor’s reviewers to be inconsistent with 24590-WTP-GPP-SANA-002. Action for follow-up on this item was assigned to two responsible individuals and the action item was entered in the “RITS” database. The assessors verified that follow-up corrective action had been taken and that this item had been closed. The assessors considered this assessment and the follow-up actions to be adequate.

Another Contractor’s assessment of SIPD records (24590-WTP-MAR-ENS-06-0014) was performed in March 2006. This assessment was limited to the CSD records approved after July 1, 2005, and looked at a sample of “high consequence” records similar to those selected for 24590-WTP-MAR-ENS-04-0022. Enough “high consequence” CSD records were selected for each facility to select a total of 10% of the total number of records approved for that facility after July 1, 2005; a total of 41 records were reviewed. Three CSD records, all for PT Facility, were found to be incomplete, with missing or incomplete SCRs in two cases and a missing CSE in the third case. A follow-up action item and a Corrective Action Request (CAR) were generated. The assessors verified that the corrective action item had been satisfactorily completed and closed. The assessors considered this assessment and the follow-up actions to be adequate.

4.8.3 Conclusions

Based on the review of appropriate documents and discussions with involved personnel, the assessors concluded Contractor’s oversight of the ISM process was adequate.

4.9 CONTRACTOR’S CHANGE SCREENING PROCESS FOR POTENTIAL EFFECT ON SELECTED STANDARDS (PART I SAFETY EVALUATIONS)

4.9.1 Assessment Scope

The assessors evaluated several Part I Safety Evaluations performed and documented by the Contractor. The Contractor performed Part I Safety Evaluations as a screening process to determine if the change could potentially affect selected safety requirements/standards in the AB. Further ISM work and an ABAR could be required if the previously identified safety requirements/standards could be affected. Those Part I Safety Evaluations that pass the screening test did not require preparation of an ABAR per the Contractor’s procedure for AB maintenance (24590-WTP-GPP-SREG-002). The assessors randomly selected for review several Part I Safety Evaluations from the lists of such evaluations for the months of October and November 2006 (CCN: 145812 and CCN: 145800, respectively). The Contractor routinely provided such monthly lists to the DOE.

4.9.2 Observations and Assessments

The assessors found the safety evaluations were appropriate and consistent with the Contractor's procedure 24590-WTP-GPP-SREG-002 and were supported by ISM evaluations of the related changes where appropriate. The assessors noted, however, that in ABAR 24590-WTP-SE-ENS-06-0111, *Incorporate Revised Design Basis Event: HLW Explosions 24590-HLW-ZOC-H01T-00001 Rev. C into HLW SED*, the change included a change to the PSAR in the severity level consequence to the public receptor for hydrogen deflagration in Newtonian waste vessels from SL-3 to SL-2. But in response to question number 3 in the Part I Safety Evaluation (Does the change result in more than a minimal, greater than or equal to 10%, increase in the frequency or consequence of the DBE as described in the SED?), the Contractor had marked the answer as "No." In view of the severity level change, the assessors considered this answer not to be true. The Contractor's explanation of the basis for the change as "a correction to make the PSAR/SED consistent with the DBE and the severity level calculation" was not considered by the assessors to be an adequate basis for a "No" answer in this case. In response to question number 4 on the form (Does the change result in more than a minimal decrease in the safety function of ITS SSC or change how a Safety Design Class or Safety Class SSC meets its respective safety function --- or change how a Safety Significant SSC meets its safety function?), the response entered is also a "No." In view of the change in severity level, the assessors also considered the basis for this "No" response to be inadequate.

Contractor's AB maintenance procedure 24590-WTP-GPP-SREG-002 states in Section 3.5, step 3:

"Sufficient detail shall be provided in the "Basis" block such that a knowledgeable individual reviewing the checklist and design change can identify the technical issues considered during the safety evaluation and the basis for the determinations."

Although the assessors generally found the Contractor's Safety Evaluations compliant with 24590-WTP-GPP-SREG-002 requirements, Observation D-06-DESIGN-034-001 was identified to document the weakness identified in the safety evaluation for ABAR 24590-WTP-SE-ENS-06-0111. The Contractor is not required to respond to this observation.

4.9.3 Conclusions

The Contractor was generally following the requirements of its AB maintenance procedure 24590-WTP-GPP-SREG-002 in conducting Part 1 Safety Evaluations, and these safety evaluations were supported by the ISM evaluation of the related changes where appropriate. However, an instance was found where the Contractor did not document an adequate basis for response to safety screening questions in a Part 1 Safety Evaluation. This instance is documented under **Observation D-06-DESIGN-034-001**.

4.10 IMPLEMENTATION OF ISM PROCESS FOR DESIGN CHANGES NOT RESULTING IN ABARS

4.10.1 Assessment Scope

The assessors randomly selected for review ISM documentation related to the evaluation of design changes implemented by the Contractor as part of the ongoing design evolution process. These changes were not directly associated with preparation of an ABAR.

4.10.2 Observations and Assessments

CCN: 108483, "Hazard Topography – At Grade Elevation (Hotcell Interior)," documented the minutes of the Lab Hazard Topography meetings held on December 1, December 10, and December 16, 2004. The meeting record indicated that the scope of the ISM meetings was defined, a Hazardous Material/Energy Checklist was provided to the participants, meeting participants included representation from relevant disciplines, and the results of the evaluation were adequately recorded. The documentation stated that SIPD entries were generated for hazards associated with SS SSCs located in the hot cell interior.

CCN: 113922, "ISM Meeting: Offgas Filter Configuration Review," documented minutes of the ISM meeting to evaluate a proposed revision to the high-efficiency particulate air (HEPA) filter configuration from four housings, each containing six HEPA filters, to five filter housings, each containing four HEPA filters. The revised configuration would utilize the first bank as the primary train with two HEPA filter housings in parallel versus one first bank filter housing. The ISM meeting considered the implications of the proposed change on the ability of the HEPA filter to meet the safety requirement for preventing the ammonium nitrate deposition in the downstream carbon beds and demonstrating that the HEPA filters would not plug with ammonium nitrate (under upset conditions) within the 2-hour cold cap burn-off time. The documentation showed that in preparation for the meeting, the Mechanical Systems representative had performed calculations on filtering capacity of the revised configuration. The meeting record showed detailed consideration of various upset conditions and operational considerations. Proposed revisions to the SIPD database were identified. Follow-up action items from the meeting were clearly recorded. The meeting had adequate participation from relevant disciplines.

CCN: 143125, "LAW ISM III: Melter Feed Anti-Siphon Controls," documented minutes of the ISM meeting to examine the configuration of the LAW melter feed system to determine what critical characteristics needed to be credited to ensure melter feed could not siphon or be drawn by an offgas system vacuum into the melter during a loss of power event. Uninterruptible power supply (UPS) batteries to power offgas exhausters were sized to provide power for two hours following loss of normal power. This period would normally be sufficient to burn off the cold cap, provided the melter feed stopped. A possible siphon action could, however, extend this cold cap burn-off period beyond two hours. The purpose of the meeting was to verify that the existing configuration was adequate to preclude siphon action, and to identify key characteristics of the design that would be specifically credited and protected in the AB. The meeting record showed a detailed discussion of the design features that could prevent siphon and identified a selected control strategy (high-level interlock to control the liquid level in the melter feed vessel to predetermined maximum level). The meeting identified an additional SCR for the SIPD to

capture the selected control strategy. Participants in the meeting included representatives from relevant disciplines, and the meeting record showed that the subject issue was discussed in detail to arrive at the selected control strategy.

4.10.3 Conclusions

The assessors concluded that the Contractor's application of the ISM process for standards selection for design changes not requiring the preparation of ABARs during design evolution was adequate.

5.0 SUMMARY OF FINDINGS

Standard 7, Paragraph (e)(2)(i) of the Contract³ required the Contractor to develop and implement a program to ensure that radiological, nuclear, and process safety requirements were defined, implemented, and maintained. Related to this requirement, the contract specified DOE/RL-96-0004, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for the RPP Waste Treatment Plant Contractor*, as the process the Contractor was to use to establish a set of radiological, nuclear, and process safety standards and requirements. The Contractor's SRD Appendix A, "Implementing Standards for Safety Standards and Requirements Identification," described the Contractor's commitment to implement an ISM process that meets these contractual requirements.

The results of the Contractor's ISM process (hazard identification and evaluation, accident analysis, hazard control strategy development, and selection of standards for implementing control strategies) are described in the WTP AB, particularly in the PSAR, Chapter 3, and the SRD, Volume II.

Section 4.1.3 of DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles*, requires the AB to be established and maintained current with respect to changes in the facility design. Related to this requirement, Standard 7, Section (e)(2)(iii), specified that the Contractor shall implement RL/REG-97-13, *Office of River Protection Position on Contractor-Initiated Changes to the Authorization Basis*, which required, among other things, that safety evaluation be performed for changes to facility design that may affect the WTP AB.

The Contractor had established procedures 24590-WTP-3DP-G04T-00901, *Design Change Control*; 24590-WTP-3DP-G04B-00046, *Engineering Drawings*; 24590-WTP-GPP-SREG-002, *Authorization Basis Maintenance*; and 24590-WTP-GPP-SANA-002, *Hazard Analysis, Development of Hazard Control Strategies, and Identification of Standards*, that implemented, among other things, the requirements and commitments described above. The procedures required that proposed design changes be reconciled with the AB, safety evaluations of proposed design changes be performed, and that the ISM process be completed, as necessary, for revisions to primary design drawings.

Based on the above requirements and procedures, the assessors identified three assessment Findings against the Contractor's ISM process. These Findings are as follows:

³ Contract No. DE-AC27-01RV14136 between the U. S. Department of Energy and Bechtel National, Inc. (BNI), dated December 11, 2000.

- **D-06-DESIGN-034-F01:** In the submittal of ABAR 24590-WTP-SE-ENS-04-0208, the Contractor described a revised design for vessels containing carbon beds in the HLW offgas system. The revised design included engineering controls designated as SS and an engineered system that closed the isolation valves in the offgas system to suppress a fire in the vessels on detection of increased carbon monoxide. In the revised design, the water deluge capability was maintained but was controlled manually by a valve(s) located outside the offgas system room. The operator may use the carbon bed temperature and process information, as well as the carbon monoxide detection, in making the determination to initiate the deluge. Operating the water deluge system would cause the vessel relief valve to open, resulting in a pressurized release of chemicals from the vessel. However, in this ABAR submittal, the Contractor failed to identify the relief valve as part of the design and, therefore, failed to evaluate the consequences of operating the deluge system, failed to propose necessary safety controls, and failed to identify IC&S for the safety control. This failure of the Contractor to properly execute its ISM process is considered an assessment Finding.
- **D-06-DESIGN-034-F02:** With respect to the ISM meetings, the Contractor's procedure, 24590-WTP-GPP-SANA-002, Section 3.2, "Responsibilities," states that the results of the ISM meetings are formally documented in accordance with Section 4.0 of the procedure and maintained as project records. However, the assessors determined the Contractor could not provide the ISM meeting minutes related to the processing of ABAR 24590-WTP-SE-ENS-05-0020. This failure of the Contractor to either conduct the ISM meeting or maintain this documentation as a project record is considered an assessment Finding.
- **D-06-DESIGN-034-F03:** Appendix A, Section 1.0 of the SRD states that IC&S for safety class (SC) and SS SSCs are specified in the SRD criteria. It also states that for APC SSCs, IC&S are specified in the ISM process, and need not be specified otherwise in the SRD, except as they are specified in Safety Criteria 4.1-2 and 4.1-3 for APC SC-II and III, and in Appendix C. The assessors identified several examples of failure to follow the requirements of Appendix A of the SRD to establish IC&S for APC SSCs. These included C5 cascade trip interlock to C3 and C2 fans, the process area plugs in the LAW Facility, the PT Facility radiation monitors, and the chilled water pressure transmitter. Failure to identify IC&S for the above APC SSCs is considered an assessment Finding..

6.0 CONTRACTOR'S PERSONNEL CONTACTED

T. Allen, Safety Implementation Manager
K. Gibson, Safety & Licensing Engineer
J. Hinckley, PT Hazard and Safety Analysis Lead
S. Johnson, BOF Nuclear Lead
D. E. Kammenzind, Quality Assurance
D. Klein, E&NS Manager
A.R. Larson, Safety Analysis Manager
M.A. Medsker, LBL Nuclear Safety Supervisor
B. Niemi, LAB Safety Analyst

M. Platt, Safety Program Lead
C. Sarka, Sr. Mechanical Engineer
S.W. Woolfolk, PT Nuclear Safety Supervisor

7.0 REFERENCES

- 24590-PTF-U0C-10-00002, *Flooding Due to Piping Failure in the Pretreatment Facility*, Rev. 0, December 20, 2006
- 24590-WTP-3DP-G04B-00046, *Engineering Drawings*, Rev. 16, February 6, 2007
- 24590-WTP-3DP-G04T-00901, *Design Change Control*, Rev. 11, April 3, 2007
- 24590-WTP-GPG-SANA-002, *Integrated Safety Management*, Rev. 8, August 31, 2006
- 24590-WTP-GPP-SANA-002, *Hazard Analysis, Development of Hazard Control Strategies, and Identification of Standards*, Rev. 19, August 24, 2006
- 24590-WTP-GPP-SANA-003, *Standards Identification Process Database*, Rev. 11, July 21, 2006
- 24590-WTP-GPP-SREG-001, *Project Safety Committee*, Rev. 10, October 5, 2006
- 24590-WTP-GPP-SREG-002, *Authorization Basis Maintenance*, Rev. 15A, November 2, 2006
- 24590-WTP-GPP-SREG-007, *Process Management Team*, Rev. 4, , November 16, 2006
- 24590-WTP-MAR-ENS-04-0001, *Evaluation of SIPD Record Approval Process*, Rev. 0, April 30, 2004
- 24590-WTP-MAR-ENS-04-0022, *Evaluation of SIPD Record Adequacy*, Rev. 0, August 25, 2004
- 24590-WTP-MAR-ENS-05-0014, *SIPD Record Quality Management Assessment*, Rev. 0, November 17, 2005
- 24590-WTP-MAR-ENS-06-0014, *Assessment of the Adequacy of Records in the Standards Identification Process Database*, Rev. 0, May 15, 2006
- 24590-WTP-RPT-ENS-03-009, *Evaluation of Facility Flooding Hazards*, Rev. 0, September 16, 2003
- 24590-WTP-SE-ENS-03-187, *Revision of the Safety Classification of the PT In-Cell Cranes from SDS_SC-II to APC_SC-II, the Out-Cell Crane from RRC to APC*, Rev. 0, April 20, 2004
- 24590-WTP-SE-ENS-04-007, *Replace IEEE 450 and IEEE 484 with IEEE 1187 and Update Revision Years for IEEE 485 and IEEE 741 in the SRD and PSAR*, Rev. 0, July 12, 2004

- 24590-WTP-SE-ENS-04-008, *Control Strategy and Classification Changes for Pretreatment Evaporator Separator Foaming Events*, Rev. 0, April 8, 2004
- 24590-WTP-SE-ENS-04-011, *Identification of NPH Standards for the SC/SS/APC Classification Scheme*, Rev. 0, March 31, 2004
- 24590-WTP-SE-ENS-04-0208, *Offgas Release and Fire Events ABAR for 3009 Implementation*, Rev. 0, February 22, 2005
- 24590-WTP-SE-ENS-04-0218, *Incorporate National Fire Protection Association 69, Standard on Explosion Prevention Systems, as an Implementing Code and Standard into the Safety Requirements Document*, Rev. 0, March 27, 2006
- 24590-WTP-SE-ENS-04-033, *Elimination of the Catch Tank for Molten Glass Spills*, Rev. 0, April 27, 2004
- 24590-WTP-SE-ENS-04-038, *Conversion of the LAW SED To DOE-STD-3009 Methodology*, Rev. 0, November 8, 2004
- 24590-WTP-SE-ENS-04-079, *New Control Strategy Due to PT Internal Flooding*;
- 24590-WTP-SE-ENS-04-090, *Change in Safety Categorization of the HFP Mechanical Agitators and Recirculation Pumps*, Rev. 0, November 10, 2004
- 24590-WTP-SE-ENS-04-100, *Proposed Control for the Prevention /Mitigation of Ammonium Nitrate Deposition in the Offgas System*, Rev. 0, June 28, 2004
- 24590-WTP-SE-ENS-05-0020, *Tailoring of IEEE 603-1998, IEEE Standard Criteria for Safety Systems of Nuclear Power Generating Stations*, Rev. 0, May 31, 2005
- 24590-WTP-SE-ENS-05-0119, *Implementation of Revised Time Basis for Single Failure Criteria for Hydrogen Mitigation in Process Vessels*, Rev. 0, February 3, 2006
- 24590-WTP-SE-ENS-05-0084, *Implementation of Hydrogen Controls for Pretreatment Facility Vessels*, Rev. 0, December 23, 2005
- 24590-WTP-SE-ENS-06-0111, *Incorporate Revised Design Basis Event: HLW Hydrogen Explosions 24590-HLW-ZOC-H01T-00001 Rev. C Into HLW SED*, Rev. 0, August 29, 2006
- 24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II*, Rev. 4, March 6, 2006
- DOE/RL-96-0004, 1998, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for TWRS Privatization*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington

DOE/RL-96-0006, 2004, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment Plant Contractor*, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington

DOE-STD-1021, 1993, *Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components*, U.S. Department of Energy, Washington, D.C.

DOE-STD-3009, 1994, *Preparation Guide For U.S Department Of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, U.S. Department of Energy, Washington, D.C.

IEEE 1187, 2002, *Recommended Practice for Installation Design and Installation of Valve Regulated Lead-Acid Storage Batteries for Stationary Applications*, Institute of Electrical and Electronics Engineers, Inc.

IEEE 603-1998, *Standard Criteria for Safety Systems for Nuclear Powergenerating Stations*, Institute of Electrical and Electronics Engineers, Inc.

NFPA 69, 2002, *Standard on Explosion Prevention Systems*, National Fire Protection Association, Quincy, Massachusetts.

ORP DI 220.1, "Conduct of Design Oversight," Rev. 1, January 2006

RL-REG-97-13, *Office of River Protection Position on Contractor-Initiated Changes to the Authorization Basis*, Rev. 11, March 2005

7.1 MEETING MINUTES

CCN: 053803, "... Path forward for resolving non-Newtonian PJM mixing issues by assessing non-Newtonian CFD modeling results and exploring options of assessing non-Newtonian applications," dated April 16, 2003

CCN: 057503, "ISM Cycle III Engineering Standards Confirmation meeting for RRC Equipment in the LAW," dated May 2, 2003

CCN: 069922, "BOF RRC Component Identification and Standards Confirmation," dated September 11, 2003

CCN: 072709, "Process Management Team #93 Meeting," dated November 18, 2003

CCN: 075292, "ISM - III Work Identification for HFP Hydrogen Mitigation," dated October 8, 2003

CCN: 075836, "Examination of FEP, TLP, and CNP Control Strategies Based on Incorporation of DOE-STD-3009 Requirements," dated October 28, 2003

CCN: 077381, "Examination of Control Strategies for Hazards Associated with the FEP Evaporator," dated December 15 and 30, 2003

Standards Selection Process (D-06-Design-034)

- CCN: 079598, "Standards Selection for PT Reclassified C&I Components," dated March 2, 2004
- CCN: 081957, "Process Management Team #98 Meeting," dated February 10, 2004
- CCN: 083754, "ISM – To discuss load drops and to resolve any miscellaneous items," dated March 29, 2004
- CCN: 085334: "Reclassification of PT Facility in-cell Cranes," dated March 25, 2004.
- CCN: 087823: "ISM Meetings for the Implementation of DOE Std. 3009 (Hydrogen Explosion Events for HFP vessels)," dated March 31, through May 26, 2004
- CCN: 088269, "110th Project Safety Committee Meeting," dated May 5, 2004
- CCN: 088276, "115th Project Safety Committee Meeting," dated July 9, 2004
- CCN: 088710, "Utilization of the existing air sparger influence correlations for the melter feed preparation vessel melter feed vessel," dated April 30, 2004
- CCN: 089940, "ISM Meeting for Conversion of LAW Safety Basis to the DOE-STD-3009 Methodology – Session 1, dated August 25, 2004
- CCN: 094178, "ISM for confirmation of 3009 Standards Selection," dated August 11, 2004
- CCN: 097910, "118th Project Safety Committee Meeting," dated August 25, 2004
- CCN: 098522, "ISM for BOF Conversion to DOE-STD-3009 Classifications, and Standards Confirmation," dated September 9, 2004
- CCN: 099681, "ISM Meeting for Conversion of LAW Safety Basis to the DOE-STD-3009 Methodology – Session 2," dated September 8, 2004
- CCN: 102890, "ISM III – Review of SIPD entries for ASX components and QA qualifications," dated December 15, 2004
- CCN: 102931, "ISM Meeting for Conversion of Law Safety Basis to the DOE-STD-3009 Methodology – Session 3," dated September 13, 2004
- CCN: 104144, "ISM Meeting for Conversion of LAW Safety Basis to the DOE-STD-3009 Methodology – Session 4, Standards Selection," dated November 1, 2004
- CCN: 105722, "Process Management Team #119 Meeting," dated March 2, 2005
- CCN: 107622, "Email concurrence regarding ABAR 03-187," dated February 1, 2005
- CCN: 108483, "Hazard Topography – At Grade Elevation (Hotcell Interior)," December 2004
- CCN: 113922, "ISM Meeting: Offgas Filter Configuration Review," March 21, 2005

CCN: 116906, "Integrated Safety Management for Control Selection for Hydrogen in Pretreatment Vessels," September 7, 2005

CCN: 128466, Meeting Minutes, "Discuss Implementation of the National Fire Protection Association 69 Standard into the SRD for the Prevention of Explosions in the Process Vessels and Cs Ion-Exchange Columns," dated October 10, 2005.

CCN: 128473, "140th Project Safety Committee Meeting," dated August 17, 2005

CCN: 129122, "ISM on Pretreatment APC Crane Standards," dated October 13, 2005

CCN: 136184, "Process Management Team #138 Meeting," dated February 21, 2006

CCN: 143125, "LAW ISM III: Melter Feed Anti-Siphon Controls," August 8, 2006

CCN: 145800, "BNI Letter for Information – Part 1 Safety Evaluations," October 19, 2006

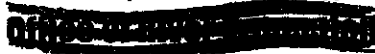
CCN: 145812, "BNI Letter for Information – Part 1 Safety Evaluations," November 20, 2006

APPENDIX A
REVIEW OF
BECHTEL NATIONAL, INC.
STANDARDS SELECTION PROCESS

Review of Bechtel National, Inc. Standards Selection Process (D-06-DESIGN-034)



U.S. Department of Energy



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

NOV 27 2006

06-WTP-176

Mr. C. M. Albert, Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Mr. Albert:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN ASSESSMENT PLAN FOR DESIGN ASSESSMENT NUMBER D-06-DESIGN-034: REVIEW OF BECHTEL NATIONAL, INC.'S (BNI) STANDARDS SELECTION PROCESS

The purpose of this letter is to notify BNI that ORP intends to perform an assessment of the BNI Standards Selection Process during the period of December 11, 2006 to December 15, 2006. This assessment will focus on the Standards Selection Process within BNI's Integrated Safety Management (ISM) Program and associated implementing procedures.

The DOE assessment team will include team members from ORP. The Assessment Plan is provided in the Attachment. BNI and its support contractors are requested to schedule the availability of the appropriate engineering management and support personnel during this period to interact with assessment team members, including providing material as requested, scheduling interviews, and providing programmatic overview of the Standards Selection Process. BNI is also requested to schedule an entrance meeting involving ORP and BNI management and assessment support personnel for December 11, 2006. An exit meeting will be scheduled following the completion of the assessment.

If you have any questions, please contact me, or your staff may call Lewis F. Miller, Jr., Acting Director, WTP Project Engineering Division, (509) 376-6817.

Sincerely,

J. Jeff Short
Contracting Officer

WTP:KC

Attachment

cc w/attach:
W. S. Elkins, BNI
D. Klein, BNI
G. Shell, BNI
BNI Correspondence

Review of Bechtel National, Inc. Standards Selection Process (D-06-DESIGN-034)

**U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP)
ASSESSMENT PLAN**

**REVIEW OF
BECHTEL NATIONAL, INC.
STANDARDS SELECTION PROCESS**

**DECEMBER 2006
Design Assessment: D-06-DESIGN-034**

Submitted by:

original signed by _____ Date 11-15-2006
Ko Chen, Assessment Team Lead
WTP Engineering Division

Concurrence:

original signed by _____ Date 11-17-2006
Lewis F. Miller Jr., Acting Director
WTP Engineering Division

Approval

original signed by _____ Date 11-17-006
John Eschenberg, Project Manager WTP

1.0 BACKGROUND, PURPOSE, AND OBJECTIVES

1.1 Background

The U. S. Department of Energy (DOE), Office of River Protection's (ORP) mission is to retrieve and treat Hanford Site tank waste and close the tank farms to protect the Columbia River. In order to complete one major component of this mission, ORP has awarded Bechtel National, Inc. (BNI) a contract for the design, construction, and commissioning of the Waste Treatment and Immobilization Plant (WTP) at the Hanford Site in Richland, Washington. In order to meet the WTP contract, DE-AC27-01RV14136, BNI (hereinafter referred to as the Contractor) is required to develop and implement an Integrated Safety Management (ISM) program to ensure that radiological, nuclear, and process safety requirements are defined, implemented, and maintained. Related to this requirement, the Contractor is committed to establish a set of radiological, nuclear, and process safety standards and requirements.

1.2 Purpose

The purpose of this assessment is to verify that the Contractor has met the contract requirements to effectively execute the program and procedures associated with the selection and implementation of WTP project implementing codes and standards. The primary focus is to assess the Contractor's implementation of its process as it pertains to standards selection.

1.3 Objectives

The following are the specific objectives of this assessment:

1. Verify each of the steps of the Contractor's ISM process, as described in Appendix A ("Implementing Standard for Safety Standards and Requirements Identification") of the "Safety Requirements Document" (SRD), has been followed by the Contractor in its selection of standards.
2. Assess the adequacy of the Contractor's ISM process with regard to identification of hazards, evaluation of the hazards, development of hazard control strategies, and selection of standards to be implemented.
3. Assess the adequacy of the Contractor's personnel training program to perform the ISM process.
4. Determine if the Contractor's standards selection process has been documented in accordance with applicable Contractor procedures and assess the adequacy of the documentation.

2.0 PROCESS

This assessment shall be conducted within the guidelines of ORP DI 220.1, "Conduct of Design Oversight," Rev. 1, issued April 18, 2006, using interviews, document reviews, and field walkdowns.

2.1 Scope

This oversight will include the review of the procedures that address all steps of the standards selection process, the authorization basis maintenance process, the design change control process, and the hazard and accident analysis processes. The assessment will also include the review of charters or procedures associated with the responsibilities and functions of the Process Management Team, Project Safety Committee, and ISM teams. The assessment will review pertinent documents that describe the results of the oversight of the standards selection process by the Process Management Team that have been completed in the last three years. Note that the last assessment of the Contractor's standards selection process was performed by ORP in May 2003.

2.2 Preparation

1. Identify the Contractor Points-of-Contact for the assessment.
2. Table 1 lists information needed from the Contractor to initiate this assessment.

7.2 REVIEW, IDENTIFY, RESOLVE, AND DOCUMENT ISSUES

The assessment team will evaluate the selected attributes and develop lines of inquiry and specific questions to be discussed with the cognizant Contractor and subcontractor personnel to meet the assessment objectives. This effort will include participating in any applicable Contractor's internal activities, meetings, training sessions, etc. The results of this effort will be documented in assessment notes used for preparation of the final report.

2.3 Reporting

The assessment team lead will brief ORP and Contractor management periodically as required. A draft report based on the team members' assessment notes will be prepared. The draft report will summarize activities, results, conclusions, and recommendations of the assessment. The draft assessment report will be issued for review and comment by ORP management and cognizant Contractor personnel. The final report will resolve comments received on the draft report.

3.0 SCHEDULE OF ACTIVITIES

Table 2 summarizes the schedule for completion of this oversight.

4.0 DOCUMENTATION

The final report of this task shall contain the sections and content as summarized in ORP DI 220.1, Attachment 9.4, "Design Oversight Report Outline."

The issues identified in this assessment shall be listed in the final report. Each issue shall be assigned an item number and shall be tracked to resolution through the Consolidated Action Reporting System (CARS). These shall also be tracked to resolution by the Contractor through

the Correspondence Control Number (CCN) that will be assigned to the transmittal of the report from ORP to the Contractor.

5.0 CLOSURE

The Team Leader, with concurrence of the WTP Engineering Division Director, shall confirm that the open items from this assessment are adequately resolved.

6.0 CRITERIA FOR ASSESSMENT

The adequacy of the Contractor's standards selection process will be assessed based on the requirements listed in the following documents:

- Appendices A and B of 24590-WTP-SRD-ESH-01-001-02, "Safety Requirements Document," as amended.
- Standard 7, Section (e)(2)(iii) of the WTP Contract.

Review of Bechtel National, Inc. Standards Selection Process (D-06-DESIGN-034)

Table 1 – Initial Information Request

1	The Contractor's procedures governing the implementation of the following: Appendices A and B of the SRD, the Authorization Basis maintenance process, the design change control process, the Standard Identification Process Database (SIPD) database, and the hazard and accident analysis process. Identify major changes to procedures since the last assessment by ORP on the same subject (May 12 through 16, 2003).
2	A list of authorization basis changes made in the last three years that affect the SRD and a list of significant design changes made in the last three years. A list of implementing standards associated with Additional Protection Class (APC) structures, systems, and components (SSC).
3	A list of ISM team meeting minutes completed in the last three years. Identify those that are associated with any of the items listed in item 2.
4	A list of documents associated with the Project Safety Committee's (PSC) review of ISM team standards selection process determinations associated with item 3.
5	A list of documents that describe the results of the oversight of the standards selection process by the Process Management Team that have been completed in the last three years.
6	Any changes to charters or procedures associated with the responsibilities and functions of the Process Management Team, PSC, and ISM teams since the last ORP assessment on the standards selection process. Also, include documentation regarding current membership of the Process Management Team and PSC.
7	Copies of all self-assessment, management assessment, and independent assessments concerning the standards selection process initiated by the Contractor since the last standards selection process assessment ORP performed. Include a list of all deficiency reports and correction action requests generated with these assessments.
8	A list of any ISM meetings and PSC reviews scheduled for the week of the assessment that will involve the review and the selection of standards under the Contractor's standards selection process.
9	A brief description of the current status of the Contractor's ISM process. Include plans and schedules associated with the ISM process and how the schedule relates to significant project milestones. If preferred, this may be provided as briefing to the assessment team during the week of December 4, 2006.

Review of Bechtel National, Inc. Standards Selection Process (D-06-DESIGN-034)

Table 2 – Schedule

Activity Description	Responsibility	Complete By
Identify and notify team members.	Chen	11/10/06
Develop and approve the Assessment Plan	Chen/Miller	11/17/06
Obtain documents from Contractor and develop lines of inquiry/interview list.	Assessment Team (Ko Chen, Ninu Kaushal, Walt Pasciak)	11/30/06
Kick-off meeting with Contractor/subcontractors to outline objectives, scope, schedule, and establish points-of-contact.	Assessment Team	12/11/06
Review relevant documents and conduct interviews with Contractor personnel, as necessary.	Assessment Team	12/11/06- 12/15/06
Prepare the Assessment Report.	Chen	12/29/06
Review of the draft Assessment Report.	Assessment Team	1/2/07-1/5/07
Resolve comments and issue Final Report including closeout with Contractor.	Chen	1/12/07