



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

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

JUN 13 2005

05-WED-022

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

Dear Mr. Henschel:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: REVIEW OF CONTACTOR PROCESS FOR PRODUCING SYSTEM DESCRIPTIONS, D-05-DESIGN-010

Reference: BNI letter from J. P. Henschel to R. J. Schepens, ORP, "Coordination of Design Oversight and Design Overview Reviews, Contract Deliverable 3.10," CCN: 063916, dated September 5, 2003.

DOE ORP has conducted a Design Oversight, as agreed in the Reference, of the process for producing System Descriptions and is transmitting the resulting report by attachment to this letter.

The Design Oversight concluded that the design process for producing System Descriptions is progressing satisfactorily. It complies with the appropriate technical and contractual requirements and follows the required processes, procedures, and guides. This Design Oversight identified no open items or adverse findings, but there were six recommendations for Bechtel National, Inc., to enhance the content of System Descriptions.

Nothing in this letter should be construed as changing the subject contract. If you have any questions, please contact me, or your staff may call William F. Hamel, Jr., Director, Waste Treatment and Immobilization Plant Project Engineering Division, (509) 373-1569.

Sincerely,

[Handwritten signature]
for Roy J. Schepens
Manager

WED:JEO

Attachment

cc w/attach:
M. A. deLamare, BNI
S. C. Lynch, BNI
D. J. Pisarcik, BNI

Attachment
05-WED-022

ORP DESIGN OVERSIGHT REPORT
REVIEW OF CONTRACTOR PROCESS FOR
PRODUCING SYSTEM DESCRIPTIONS

March 2005

Design Oversight: D-05-DESIGN-010

WED:JEO
May 9, 2005

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

ORP DESIGN OVERSIGHT REPORT

REVIEW OF CONTRACTOR PROCESS FOR PRODUCING SYSTEM DESCRIPTIONS

March 2005

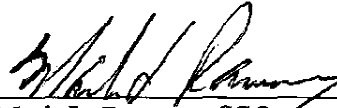
Design Oversight: D-05-DESIGN-010

Team Lead:



John E. Orchard, SSO
WTP Engineering Division

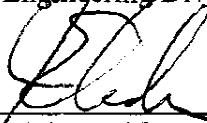
Reviewers:



Mark L. Ramsay, SSO
WTP Engineering Division

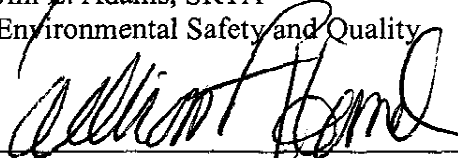


Jim J. Davis, SSO
WTP Engineering Division



Jim E. Adams, SRTA
Environmental Safety and Quality

Concurrence:



William F. Hamel, Director
WTP Engineering Division

5/23/2005

Approved:



John R. Eschenberg, Project Manager
Waste Treatment Plant

5/23/2005

Executive Summary

The U.S. Department of Energy (DOE), Office of River Protection (ORP) staff and technical support contractor staff have conducted a design oversight to:

1. Identify and understand the technical requirements imposed on and selected by the Contractor for preparing the System Description.
2. Identify and understand the applicable processes, procedures, guides, etc. used by the Contractor for preparing the System Description.
3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design activity under review are being appropriately addressed.

The Design Oversight concluded that the design process for preparing System Descriptions is satisfactory. It complies with the appropriate technical and contractual requirements and follows the required processes, procedures, and guides. This Design Oversight identified no open items or adverse findings, but there were six recommendations for BNI to enhance the content of System Descriptions.

The Design Oversight observed that the System Descriptions are focused on collecting the details of the operations and controls strategies necessary for preparation of the Software Functional Specifications for the respective systems. This is appropriate at this stage of the design process. The System Descriptions also include the higher-level system requirements as recorded from the Design Criteria Database, but they are not explained in the context of the system or how they are implemented. However, BNI is developing a requirements database and system-specific requirements verification tables that correlate the system requirements to the system functions and to derived objective and quantitative requirements, to the requirement-specific verification strategy, and the Test Acceptance Criteria. The System Descriptions tend to be light in other areas that are anticipated to be developed as the design process progresses.

The Design Oversight also reviewed BNI oversight performance, management assessments, QA audits, and Corrective Action Reports, and open DOE Findings and Assessment Follow-up Items (AFI). The Design Oversight concluded that the BNI oversight was effective and the applicable recommendations are being appropriately tracked and implemented. The Design Oversight, via the Assessment Note in Appendix C, closed the last open Finding on the Design Process and the last open AFI on the Configuration Management Process, and facilitated the closure of the Price-Anderson Non-Conformance Tracking System item NTS-2003-0001 on Design Process. Therefore, the Design Process appears to be fully compliant and effective from the DOE perspective.

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1.0 INTRODUCTION

A major component of the US Department of Energy (DOE), Office of River Protection (ORP) mission is the design and construction of the Waste Treatment and Immobilization Plant (WTP) in the 200 East Area of the Hanford Site. The design and construction contractor for the WTP is Bechtel National, Inc (BNI). As part of its oversight responsibilities, ORP performs various assessments of BNI activities during the design and construction phase. One type of assessment is the design review of various systems, called a Design Oversight, performed by the WTP Engineering Division (WED).

This Design Oversight focused on the System Description (SD), which is a contractually required design product. The SD is intended to satisfy several needs in the project, including internal and external commitments. BNI procedure 24590-WTP-G04T-00903 and Design Guide 24590-WTP-GPG-ENG-078 have been developed to ensure these needs are adequately captured. One purpose of the oversight is to evaluate the adequacy of how the procedure and guide require all applicable project needs and commitments to be captured in the SDs, and the adequacy of how the completed SDs do so. This entailed identifying current and future project needs and commitments, including those for startup and commissioning under this contract as well as for full operations under a future operations contract, then determining the method and timing for appropriately capturing them.

The formal phase of the Design Oversight occurred in February and March 2005, consisted of BNI staff interviews, document reviews, and fact finding. The team pursued clarification and elaboration of the initial information through March, and prepared the Report in April. The Preliminary Report has been informally reviewed by BNI, for factual accuracy before issuing the Final Report. There were no open items or adverse findings, but there were six recommendations for BNI to enhance the content of System Descriptions.

2.0 BACKGROUND

It is currently estimated there will be approximately 127 System Descriptions prepared for the various systems throughout the Waste Treatment and Immobilization Plant (WTP). Each system (or group of related systems) will have a System Description (SD) that will include a compilation of summary level information, detailed information, and references to other pertinent information. The purpose of the SD continues to mature and therefore the definition of the included and referenced information changes. Initially the SD served as an informal record of design information, more recently it has been adapted to include enabling assumptions of operating conditions, start-up test acceptance criteria, and a more rigorous list of design criteria systematically collected from the Design Criteria Database. It is foreseeable that the SD will eventually provide a configuration controlled list of design, test, and operations parameters for the system engineer in the Operations and Maintenance (O&M) organization, providing the foundation for the System Design Description as required by DOE STD 3024-98.

Bechtel National, Inc. (BNI) assigns lead responsibility for each system to the design discipline that has responsibility for the primary system functions. Within the lead discipline, a "System

Lead” is assigned to be responsible for developing the SD as the design progresses, identifying the functions and requirements, developing the test acceptance criteria, capturing operational concepts, and maintaining the technical content of the SD. The system lead also coordinates the preparation of the P&IDs, the Software Functional Specification, the equipment specifications, Integrated Safety Management System (ISMS) reviews, as low as reasonably achievable (ALARA) review, etc.

The WTP Contract Section C6, Standard 3, Para. (c)(1), states: “System Descriptions: The system descriptions shall include references to all design documents (process flow diagrams, piping and instrument diagrams, engineering calculations, process data sheets, Research and Technology (R&T) development work and test reports, material handling diagrams, mechanical flow diagrams, design proposal drawings, etc.) associated with the applicable systems.”

3.0 OBJECTIVES, SCOPE AND APPROACH

3.1 Objectives

This design oversight was conducted as part of ORP’s responsibility as owner of the WTP to ensure that the design and planned operations comply with the appropriate functional and operating requirements. The following are the specific objectives of this oversight:

1. Identify and understand the technical requirements imposed on and selected by the Contractor for preparing the System Description.
2. Identify and understand the applicable processes, procedures, guides, etc. used by the Contractor for preparing the System Description.
3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design activity under review are being appropriately addressed.

3.2 Scope

This oversight included a review of the design processes and the design products produced to date in support of preparing the System Descriptions. This included procedures, calculations, deliverables, and other documents that describe the applicable processes and products.

This oversight also included observing the internal functioning of the BNI design process to assess its effectiveness in producing the design products under review.

3.3 Approach

The oversight was conducted within the guidelines of ORP PD 220.1-12, “Conduct of Design Oversight.” Information was collected from various BNI documents, DOE documents, and interviews with BNI design staff. A full listing of reviewed documents and personnel contacted is provided in Section 6.

The review team consisted of team lead John Orchard, Mark Ramsay, Jim Davis, and Jim Adams. The approved design oversight review plan is provided in Appendix A.

Six steps were identified to provide the information required to meet the design review objectives. The order of review and depth of each step was left to the reviewer's discretion.

- Evaluate a sample of recently completed SDs including those for "Q" systems, mechanical and non-mechanical systems, and multi-systems (consolidated system descriptions).
- Evaluate the procedure, Engineering Department Project Instructions (EDPI) 24590-WTP-3DP-G04T-00903, Revision 4, System Descriptions and Test Acceptance Criteria, Design Guide, 24590-WTP-GPG-ENG-078, Revision 0, System Descriptions, and other implementing documents.
- Evaluate the Engineering Deliverables to Construction and Startup/Commissioning procedure, 24590-WTP-3DP-G04B-00047, Revision 3, and the Construction System and Area Completion and Turnover procedure, 24590-WTP-GPP-CON1602, Revision DRAFT.
- Evaluate corresponding Software Functional Specifications (SFSs), Piping and Instrumentation Diagrams (P&IDs), etc. that form information package for future operator.
- Evaluate DOE-STD-3024-98 for System Design Descriptions (SDDs) and other references for gap analysis.
- Evaluate BNI Corrective Action Report (CAR) log for prior DOE issues and BNI internal management assessments.

The following five SDs were selected for review, and distributed among the reviewers. The reviewers evaluated the SDs against the Procedure, the Design Guide, and the DOE standard for SDDs. Review comments were submitted independently by each reviewer and are attached in Appendix B. BNI management assessments, CARs, and DOE issues were also reviewed, and comments submitted and attached in Appendix B. The comments are summarized in the results section of this report.

- 24590-LAW-3YD-20-00003, Revision 0, Combined LAW Ventilation System Description for Systems C1V, C2V, C3V, and C5V; John Orchard
- 24590-WTP-3YD-DCE-00001, Revision 0, System Description for the 125V DC Power Distribution System, DCE; Mark Ramsay
- 24950-HLW-3YD-HCP-0001, Revision 0, Consolidated System Description for the WTP Plant Cooling Water (PCW) Systems; Jim Davis
- 24950-WTP-3YD-SHR-00001, Revision 0, System Description for WTP Reagents (SHR, NAR, AFR, SPR, STR, and SNR); Jim Adams
- 24950-HLW-3YD-HFP-00001, Revision 1, System Description for HLW Concentrate Receipt and Melter Feed Process Systems (HCP and HFP); Jim Adams

4.0 RESULTS

The reviewers evaluated the sample SDs against the Procedure, 24590-WTP-3DP-G04T-00903, Rev 4, System Descriptions and Test Acceptance Criteria; the Design Guide, 24590-WTP-GPG-ENG-078, Rev 0, System Descriptions; and DOE Standard 1034, Content of System Design

Descriptions. Review comments were submitted independently by each reviewer and are attached in Appendix B. BNI management assessments, CARs, and DOE issues were also reviewed, and comments submitted and attached in Appendix C. The comments are summarized below.

4.1 Compliance with the Contract, the Procedure, and the Design Guide

The Contract only requires that SDs include references to all applicable design documents. All the sampled SDs contained Section 10, Applicable Documents, which were well populated though they weren't examined for completeness. Therefore, they meet the minimum requirement of the Contract. The Procedure and the Design Guide specify significantly more scope and detail for the SD; therefore, if the SDs satisfy the Procedure and the Design Guide, then they meet or exceed the Contract requirements.

The Procedure provides a format in Exhibit B that all the sampled SDs followed. The Procedure states, "SDs describe the system equipment, unit operations, sequences, basic interlocks, and recovery operations that are consistent with the development of the Piping and Instrumentation Diagrams (P&IDs), Ventilation and Instrumentation Diagrams (V&IDs), and mechanical Handling Diagrams (MHDs)." Electrical drawings, such as one-lines, are not specified in the Procedure although they are specified in Appendix A, Section 10 of the Design Guide. They are applicable design documents and necessary for understanding how the system functions, especially in normal, upset, and recovery operations; therefore, they should be listed in the SDs. They were not included in some of the SDs reviewed, presumably because those systems had not progressed far enough into design, but in those cases, the load lists, which had been developed, were included in the SD. SDs also require a Test Acceptance Criteria (TAC) unless determined otherwise by the design authority; however, it is not specified how this exception is accomplished or documented. Therefore, in the sample SD where the TAC is not included, it's not clear whether there is a lack of compliance or simply a lack of effectiveness. The current plan is to develop a list of criteria for inclusion in the Design Guide to clarify when TACs are not required, why they're not required, and where the equivalent information can be found. For instance, for a design-build subcontract, such as the 125 volt DC power distribution system (DCE), the acceptance criteria that the subcontractor must demonstrate for turnover to Construction are found in the DCE specification.

The Design Guide is very detailed and prescriptive. While neither the Procedure nor the Design Guide indicate a relationship between the SD and the respective software functional specification (SFS), the level of detail is significantly enhanced in those sections that feed the SFS, primarily Section 7, Operations, and applicable parts of Sections 6, Description, and Section 8, Maintenance. However, all the other sections are underdeveloped; they superficially address the format but miss the intent of the Design Guide. It is recognized that this is because the immediate need for the SD is to support the development of the SFS, but the other sections of the SD need to be improved to satisfy the Design Guide as soon as the system design has progressed far enough that the detailed information becomes available.

4.2 Comparison to DOE Standard 1034, System Design Descriptions

SDs do not meet the requirements of SDDs. SDDs are intended to be source books for the operator, whereas SDs are currently intended to be guide books for the designer. A lot of the information is similar but the focus and level of detail is different. Although the titles of the sections, ordering of the chapters, and general structure are not the same, SDs adequately address the majority of the sections in SDDs. Those sections that are missing fall into four categories:

1. Not applicable such as: nuclear criticality safety, security and SNM protection, temporary configurations;
2. Currently not applicable but may change due to further AB development: TSR-Required Surveillances, Safety Management Programs and Administrative Controls;
3. To be developed with system progress in design/construction: Prestartup, system startup, system shutdown, system procedures;
4. May want to include: Human Interface Requirements, Fire Protection, Special Installation Requirements, Non-TSR Inspections and Testing.

4.3 BNI Management Assessments, CARs, and DOE Issues

This oversight determined that relative to the Design Process there was one outstanding DOE finding (IR-02-015-01), one BNI CAR (CAR-04-238), and one DOE AFI (A-04-ESQ-RPPWTP-011) that tracks the CAR. The finding was closed as part of this oversight by the Assessment Note attached in Appendix C. The CAR was closed by BNI on April 7, 2005, and the AFI that tracked it was closed as part of this oversight by the Assessment Note attached in Appendix C. This closes all outstanding Design Process and Configuration Management issues previously identified by DOE. This also facilitates the closure of the Price Anderson Non-Conformance Tracking System item NTS-2003-0001 on Design Process.

In reviewing the status of BNI oversight, including QA audits, offsite independent audits, and engineering management assessments of the Design Process, it was learned that the Design Verification (DV) program had some perceived weaknesses in effectiveness that caused BNI to charter an offsite independent assessment of the DV program. This assessment recommended twenty enhancements to the program that would support future system turnovers, testing, and the ORR, based on lessons learned from the offsite independent assessor's experience (CCN: 116525). BNI has evaluated these recommendations and prepared a "Design Verification Path Forward" (CCN: 114079) in which they committed to implement the recommendations through eight actions tracked by RITS # 24590-WTP-RITS-QAIS-05-503, -506, and -507. The oversight assessors reviewed the independent assessment report, a preliminary outline of the path forward, a prototype system design requirements verification matrix that implements one of the more significant recommendations, and a draft trend that implements preparing the matrix (25490-WTP-TN-03-01734). The assessors concluded that implementing the path forward and especially the system design requirements verification matrix will both strengthen the design verification program and help to validate the flowdown of the system requirements listed in the system descriptions.

5.0 OPEN ITEMS AND RECOMMENDATIONS

- Recommendation #1:

It is recommended that BNI provide an explanation in the SD when information required by the Design Guide is not included. Examples include TACs for DCE, electrical elementaries for SHR, and Safety Functions (RCC/APC) for LAW Ventilation System Descriptions.

- Recommendation #2:

It is recommended that BNI prepare a Systems Requirements Database per System Description Design Guide paragraph 3.1.6, and/or include in the SD a Requirements Verification Table. This is currently planned to be done through the SLATE database and the Design Verification Path Forward, respectively.

- Recommendation #3:

It is recommended that BNI prepare a cross-reference between the Functions in Section 3 and the Requirements in Section 4, and possibly the decomposed requirements in the Requirements Verification Table and in the TAC. This could be implemented through the SLATE database in conjunction with recommendation #2, above.

- Recommendation #4:

It is recommended that BNI include in the SD the specific sections of codes, standards, and top-level documents applicable to the system when listing them in Section 4, Requirements, or 10, Applicable Documents. This recommendation should at least be implemented for all ITS systems and major process systems, as is currently planned to be done by the Requirements Verification Table in 45 selected SDs.

- Recommendation #5:

It is recommended that BNI include in the SD a description of the mitigating or recovery actions required on detection of faults, process upsets, or abnormal operating conditions, per System Description Design Guide paragraph 7.0.

- Recommendation #6:

It is recommended that BNI expedite issuing each SD as a design document, to support issuing the respective SFS as a design document.

6.0 REFERENCES AND PERSONNEL CONTACTED

6.1 References

1. DE-AC27-01RV14136, Waste Treatment Plant Contract
2. 24590-WTP-RPT-OP-01-001, Revision 2, Operations Requirements Document
3. 24590-WTP-DB-ENG-01-001, Revision 1b, Basis of Design
4. 24590-WTP-3DP-G04T-00903, Revision 4, System Descriptions and Test Acceptance Criteria
5. 24590-WTP-GPG-ENG-078, Revision 0, System Descriptions
6. 24590-WTP-3DP-G04B-00047, Revision 3, Engineering Deliverables to Construction and Startup/Commissioning
7. 24590-WTP-MAR-ENG-04-001, Revision 0, RPP-WTP System Descriptions
8. CCN: 116525, Submittal of Independent Design Verification Assessment (Ballweg Report)
9. 24590-WTP-PL-OP-05-0001, Revision DRAFT, Plan for Determining Readiness for ORR
10. 24590-WTP-GPP-CON-1604, Revision DRAFT, System and Area Completion and Turnover
11. DOE-STD-3024-98, Content of System Design Descriptions
12. 24590-LAW-3YD-20-00003, Revision 0, Combined LAW Ventilation System Description for Systems C1V, C2V, C3V, and C5V
13. 24590-WTP-3YD-DCE-00001, Revision 0, System Description for the 125V DC Power Distribution System, DCE
14. 24950-HLW-3YD-HCP-0001, Revision 0, Consolidated System Description for the WTP Plant Cooling Water (PCW) Systems
15. 24950-WTP-3YD-SHR-00001, Revision 0, System Description for WTP Reagents (SHR, NAR, AFR, SPR, STR, and SNR)
16. 24950-HLW-3YD-HFP-00001, Revision 1, System Description for HLW Concentrate Receipt and Melter Feed Process Systems (HCP and HFP)

6.2 Personnel Contacted

Steve Lynch
Steve Foebler
Jim Wilson

Dave Pisacek
Mike deLamare
Dennis Collins

Marty Ehlinger

APPENDIX A – OVERSIGHT PLAN

U.S. Department of Energy (DOE), Office of River Protection (ORP)

DESIGN PRODUCT OVERSIGHT PLAN

**REVIEW OF CONTRACTOR PROCESS FOR
PREPARATION OF SYSTEM DESCRIPTIONS**

February 1, 2005

Design Oversight: D-05-DESIGN-010

Team Lead: John E. Orchard

Reviewer(s): John E. Orchard

Mark L. Ramsay

Jim J. Davis

Jim E. Adams

Submitted by:

_____ Date _____
John E. Orchard, Team Lead
WTP Engineering Division

Concurrence:

_____ Date _____
William F. Hamel, Director
WTP Engineering Division

1.0 BACKGROUND, PURPOSE AND OBJECTIVES

1.1 Background

There are approximately 150 systems in the Waste Treatment and Immobilization Plant (WTP). Each system (or group of related systems) will have a System Description (SD) that will include a compilation of summary level information, the most significant detailed information, and references to other pertinent information. The purpose of the SD continues to mature and therefore the definition of the included and referenced information changes. Initially the SD served as an informal record of design information, more recently it has been adapted to include enabling assumptions of operating conditions, and start-up test acceptance criteria. It is foreseeable that the SD will eventually provide a configuration controlled list of design, test, and operations parameters for the system engineer in the Operations and Maintenance (O&M) organization, providing the foundation for the System Design Description as required by DOE STD 3024-98.

Bechtel National, Inc. (BNI) assigns lead responsibility for each system to the design discipline that has the most scope – usually mechanical, but also electrical or controls. Within the lead discipline, a “System Lead” is assigned to be responsible for developing the SD as the design progresses, identifying the baseline operating data, developing the test acceptance criteria, and maintaining the technical content of the SD. The system lead also coordinates the preparation of the P&IDs, the Software Functional Specification, the equipment specifications, Integrated Safety Management System (ISMS) reviews, as low as reasonably achievable (ALARA) review, etc.

The WTP Contract Section C6, Standard 3, Para. (c)(1), states: “System Descriptions: The system descriptions shall include references to all design documents (process flow diagrams, piping and instrument diagrams, engineering calculations, process data sheets, Research and Technology (R&T) development work and test reports, material handling diagrams, mechanical flow diagrams, design proposal drawings, etc.) associated with the applicable systems.”

1.2 Purpose

The purposes of this review is to confirm that the Contractor design process effectively implements all Contract and other applicable technical requirements for the design activity under review to ensure long-term operability and optimal life cycle cost of the WTP.

1.3 Objectives

The following are the specific objectives of this oversight:

1. Identify and understand the technical requirements imposed on and selected by the Contractor for performing the design activity under review.
2. Identify and understand the applicable processes, procedures, guides, etc. used by the Contractor for performing the design activity under review.

3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design activity under review are being appropriately addressed.

2.0 PROCESS

This oversight shall be conducted within the guidelines of ORP PD 220.12, issued February 12, 2003, "Conduct of Design Oversight."

2.1 Scope

This oversight will include review of the design processes and the design products produced to date in support of the topic under review. This will include procedures, calculations, deliverables, and other documents that describe the applicable processes and products.

This oversight will also include monitoring the internal functioning of the BNI design process to assess its effectiveness in producing the design products under review.

2.2 Preparation

1. Identify the Contractor Point of Contact for the Review.
2. Establish the scope and elements of the design processes and deliverables under review.
3. Identify and review the applicable Contract and requirements source documents.
4. Review background information as provided by Contractor and identified through review of available databases.
5. Review previously performed Contractor design review reports, documentation, open issues, and the plans for and status of their resolution.
6. Review the applicable design processes and a sample of the resulting design deliverables.
7. Table 1 lists information requested from the Contractor to initiate this oversight.

2.3 Review and Identify, Resolve or Document Issues

Evaluate the selected attributes and develop lines of inquiry and specific questions that are then explored with cognizant Contractor personnel to meet the oversight objectives. This phase will be documented in summary tables as shown in ORP PD 220.12, issued February 12, 2003, "Conduct of Design Oversight," Attachment 9.4, Appendix A. This effort will include participating in any applicable internal Contractor reviews and discussions. The output from this phase of the oversight will be a completed summary table with Contractor responses to the

questions and lines of inquiry and a list of remaining open issues that need further evaluation by Contractor for resolution.

2.4 Reporting

De-brief ORP and Contractor management periodically as required. Prepare a draft report that summarizes the activities, the results, conclusions and recommendations of the review. Issue the Draft Design Oversight Report for review and comment of 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 PD 220.12, issued February 12, 2003, "Conduct of Design Oversight," Attachment 9.4, "Design Oversight Report Outline."

The open issues identified in this oversight shall be listed in the final report. Each open 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 Contractor through the Correspondence Control Number (CCN) that will be assigned to the transmittal of the report from ORP to Contractor.

5.0 CLOSURE

The Team Leader with concurrence of the Director shall confirm that the open items from this oversight are adequately resolved.

Table 1 – Initial Information Requirements

1.	Points of contact, lines of authority, and divisions of responsibility for design groups involved in the Control Room design.
2.	Procedures, guides, instructions, templates, etc. used in the design process.
3.	Applicable technical evaluations, reports, calculations, system descriptions, specifications, and drawings, including schematics, P&IDs, V&IDs, layouts, arrangements, etc.

Table 2 – Schedule

Activity Description	Responsibility	Complete By
Develop Design Product Oversight Plan.	Team Lead	03/01/05
Identify Team members.	Hamel	03/01/05
Advise Contractor of planned oversight and provide Design Product Oversight Plan to identify needed Contractor support.	Eschenberg/Hamel	03/01/05
Kick-off meeting with Contractor Discipline Engineering Managers to outline objectives, scope, schedule, and establish points of contact.	Team	03/07/05
Obtain documents from Contractor.	Team	03/14/05
Review Contractor documents, participate in relevant Contractor internal meetings and meet with Contractor as required.	Team	03/21/05
Prepare Draft Design Oversight Report.	Team	03/21/05
ORP and Contractor review of Report.	Team and Contractor	03/28/05
Resolve comments and issue Final Report including close out with Contractor.	Team	03/28/05

APPENDIX B – Review Comments for the sample SDs against the Procedure for SDs, the Design Guide for SDs, and the DOE Standard 1034 for SDDs

1. Review comments for the *Combined LAW Ventilation System Description for Systems CIV, C2V, C3V, and C5V, 24950-LAW-3YD-20-00003, Revision 0.*

- The SD satisfies the Contract and the Procedure. The Design Guide is more detailed and prescriptive, causing some sections of the SD to satisfy the intent but other sections to only superficially address the format, as outlined below.
- Section 1, Introduction, should include a summary level description of the purpose of the system(s). The information here is very detailed and belongs in Section 2.2 System Overview (or Section 3, Functions) and Section 2.2 would be more appropriate in Section 1, Introduction.
- Section 2, Scope, is sufficient and appropriate (except Section 2.2 as noted above).
- Section 3, Functions, is underdeveloped and too generic, at the same time specifying design solutions. Safety functions (e.g. RCC/APC) are not included (although Safety Requirements are included in Section 4).
- Section 4, Requirements, tends to be subjective and qualitative rather than objective and quantitative, typically quoting or paraphrasing higher-level generic requirements documents. This provides limited value-added unless the requirements are entered into a requirements database (per Guide 3.1.6) for requirements traceability, quantification, and objective verification. This is currently planned to be done through the SLATE database and the Requirements Verification Table.
- Section 5, Design Standardization, is undeveloped, does not satisfy the Design Guide.
- Section 6, Description, is well developed, clearly to support SFS preparation.
- Section 7, Operations, is very well developed, clearly to support SFS preparation.
- Section 8, Maintenance, is sporadic, with emphasis on information that supports SFS.
- Section 9, Interface Systems, is underdeveloped and only lists interfacing systems without specifying the nature of the interface as required by the Design Guide.
- Section 10, Applicable Documents, has a long list including many applicable calculations.
- Section 11, Appendices/ Test Acceptance Criteria, is substantial and appears thorough. It satisfies the intent including identifying the baseline operating data that needs to be collected.

2. **Review comments for *System Description for the 125V DC Power Distribution System, DCE, 24590-WTP-3YD-DCE-00001, Revision 0.***

- The SD appears to be compliant with the BNI guide both in format and content.
- Section 10 of the SD, “Applicable Documents” adequately satisfies the BNI contract requirements associated with SDs. However, section 10 also provides a list of industry standards and codes that doesn’t add much utility simply because the extent to which the standard applies is not indicated anywhere in the SD. The list of standards is provided in the BOD and repeating part of the list in the SDs without something that indicates how they are applied seems like a waste of effort.
- The SD included a section that addressed TAC. Unfortunately, the only thing written was: “Not applicable. Test Acceptance Criteria (TAC) applies to testing of the WTP process facilities performed or witnessed by Startup. There are no such tests for this system.”

There is no place in the guide that references the criteria for why some facilities must have test criteria and why others do not. I think this is a mistake. Every system, certainly those systems that are SDC or SDS, should be tested for functionality and therefore should have test criteria.

- The SD as it compares to the format and content of an SDD generally falls far short. While there is some correlation, the SD lacks the level of detail specificity indicated in the SDD. One area that has potential however, is in the requirements portion. If the specific reference for each requirement could be provided this would take care of the standards reference problem sited above and also make the document just a little more like an SDD.
- Another recommended improvement that could provide additional value would be to describe briefly what *actions* are expected to be made by the plant ops personnel under the “Abnormal Operation Conditions” in Section 7.

3. Review comments for the *Consolidated System Description for the WTP Plant Cooling Water (PCW) Systems, 24950-WTP-3YD-PCW-00001, Revision 0.*

The document is well written and appears to fully describe the PCW system for BOF, HLW, LAW, & PTF. From a mechanical perspective all elements pertinent to design of the system appear to be covered. I compared this SD to the documents listed below:

BNI's guide for writing SD's, # GPG-ENG-078, Revision 1:

The PCW SD contains all of the elements specified in Appendix B of the guide, which pertains to format of SD's. Sufficient detail is provided to cover most of the elements, and on the others an appropriate reference is provided.

In addition, Appendices C, D & E were followed in the development of system functions, requirements and TAC in the PCW SD.

Signatures appear to be appropriate in that the author, discipline lead, and the four facilities have signed, although I am not familiar with the signatories.

BNI's Engineering Department Project Instructions for "System Descriptions and Test Acceptance Criteria", # 3DP-G04T-00903:

This project instructions lists the same format requirements and concurrence requirements as the BNI guide for writing SD's and TAC's therefore the PCW SD is consistent with this instruction.

DOE's Content of System Design Descriptions, DOE-STD-3024-98

The format of the PCW SD is consistent with BNI documents but was not intended to meet the "Outline of an SDD" requirements shown in the DOE standard. The outline specifies extensive criteria that should be within an System Design Description, however the standard does note that the outline list is "intentionally exhaustive" and "not intended to define some minimum content requirement, but rather to provide general guidance." The standard also contains a section on the graded approach application of the standard in developing SDD's. That said, the SD was compared to the Outline requirements.

Although the titles of the sections, ordering of the chapters and general structure are not the same, the PCW SD adequately addresses the majority of the sections of the SDD outline. Those that appear to be missing fall into 4 categories:

- Not applicable such as: nuclear criticality safety, security and SNM protection, temporary configurations;
- Currently not applicable but may change due to SB changes: TSR-Required Surveillances, Safety Management Programs and Administrative Controls;
- To be developed with system progress in design/construction: Prestartup, system startup, system shutdown, system procedures;
- May want to include: Human Interface Requirements, Fire Protection, Special Installation Requirements, Non-TSR Inspections and Testing.

WTP Contract requirements as specified in the Oversight Plan

The PCW SD contains references to system design drawings, process flow diagrams P&ID's, and engineering calculations which would be the appropriate references for a cooling system. The contract lists other design documents such as R&T reports, material handling diagrams, mechanical flow diagrams and others which are considered be unnecessary for the PCW SD.

4. Review comments for the System Description for WTP Reagents (SHR, NAR, AFR, SPR, STR, and SNR), 24950-WTP-3YD-SHR-00001, Revision 0.

The assessor pursued the following lines of inquiry:

- 1) Is the reagent system subject to the Process Safety Management of Highly Hazardous Chemicals 29 CFR 1910.119 and if not why not. Not seen as reference.
- 2) Discuss the statement the DCD identifies many “potential requirements” for these systems. What is the difference between a requirement and a “potential requirement” and how does the SD distinguish or report potential requirements.
- 3) How was the requirement listing in the SDs obtained? Obviously word searches are performed for each DCD printout. Please list the keyword word searches that have been performed to obtain the requirements listing in Section 4.0 and relate this to the word searches used by the lead design engineer from each discipline in approving the PFD, P&ID, ISM cycle 3, SIPD, CIS, IN tools, etc.
- 4) How was the requirements listing verified within the design i.e. is there a checklist used to determine the SD design requirements are in the design?
- 5) TACs are limited to proving design works to prevent identified accident scenarios but do not test to see if functional requirements are met. Discuss why testing program does not test to accomplish basis function of system. Only one system SHR is in TACs-NAR, AFR, SPR, STR and SNR not in TACs yet.
- 6) Discuss relationship between sequence diagrams in Appendix A and the Software Function Specifications providing programmable operational software. SFS is not in references.
- 7) No CIS, IN tools references. No elementaries
- 8) No alarms, trips or set points defined-only listed as existing
- 9) Why are concentration monitors not yet defined in the design? These should be easy and commercially available. Is the range not known? Why is the nitric acid scrubber not yet designed for NOx emissions.
- 10) The design of the several of these systems seems to be incomplete based on the statements of “No other information is available at this time” in many locations. Is this an accurate statement-if not done, why?

Through interviews and further document reviews, the assessor determined the SD was compliant, as reported in the Assessment Note in Appendix C.

5. Review comments for the *System Description for HLW Concentrate Receipt and Melter Feed Process Systems (HCP and HFP), 24950-HLW-3YD-HFP-00001, Revision 1.*

There are a number of issues going on inside this system description which may require us to ask the question, is it really ready to be reviewed. First, there are ABARs (ENS-04-090) still pending which have been incorporated into the design but are not yet approved. Next, they have defined a new safety class known as APC (additional protection class). I'm not sure if this is an approved classification yet within the PSAR. There are control strategies needing to be system level tested to prevent inadvertent addition of water to the vessel by the cooling water system, but the TACs only do component testing.

In general, it sounds like the design is still moving. The system description Section 4 makes a series of statements from the BOD and other standards that the system will do or meet certain design statements, but it is not clear how (The hydrogen mitigation purge system is designed to maintain H₂ concentration in the vessel headspace below 1% by volume... but it does not say how this is done.) It is good that the SD is spelling out specific wording of the design requirement documents such as the contract, the BOD, the SED etc, but the SD does not tell us how these are accomplished. Based on our hall conversation, I would like to begin interviews with DeLamar and the Lead System Engineer on Section 4.0 do understand how the design accomplishes these requirements i.e. show me on the prints or calcs or TACs or something that not only is it required to be in the design, it is in the design. Before I review this further, is the SD supposed to do that and if not, how do we verify that it is in the design. Should it be our understanding that because the SD is approved with these design statements in the SD that these statements are in the design somewhere, somehow.

I have also done a cursory (more to follow) review of the TACs for this system and they have greatly limited the testing program to the "major safety related" requirements. Things such as proving the tank volumes meet the contract are done by contractor as-builts not by filling the tanks. Interlock trips are not tested as a part of an integrated water run test but only individually simulated. I would like to challenge this minimalist testing program and lobby for real testing that does not make the bad discoveries in the middle of cold commission or worse yet hot commissioning.

In addition, I do not see the CM databases (SIPD, CIS, INtools, SETROUTE, etc) referenced in the SD. The components of the system should be listed using a CIS/INtools reference which should include at turnover, the point in time printout of the databases to show the component information to the system or have that in the turnover package with access to the database available to the operating contractor.

The SD should refer to the electrical elementary and interconnection wiring diagrams or programmable logic interfaces which have all interlocks and trips loaded in PC logic with a listing of what the trips are and at what set points (with error bands). The Table 7-3 does list the trips, alarms and interlocks but does not give instrument ranges, tolerances, set point levels, or alarm set point numbers. The INtools should give this.

The software functional specification 24590-LW-3PS-HFP-T0001 and the safety systems requirements specifications HLW-3PS-PPJ-T0001 should have been put in references.

Through interviews with the responsible lead system engineer for HCP/HFP and others, and further document reviews, the assessor determined the SD was compliant, as reported in the Assessment Note in Appendix C.

APPENDIX C – Review Comments for BNI management assessments, CARs, and DOE issues from Design Process/System Description Assessments

Design Process/System Description Assessment Note D-05-DESIGN-010-01

Author: J.E. Adams

Date: April 7, 2005

Background

Since the beginning of the River Protection Program Waste Treatment Plant (RPPWTP) Contract, the Department of Energy (DOE) Design Process Inspections of the Bechtel National Incorporated (BNI) RPPWTP have been done by DOE-Richland (RL) Office of Safety Regulation (OSR) and DOE-Office of River Protection (ORP) Environmental, Safety and Quality (ES&Q) organization using Inspection Test Procedure (ITP)-104, *Design Process Assessment* to overview the BNI design/construct work processes and procedures. During this period, ORP has identified some significant deficiencies in design process, which BNI has acknowledged and corrected. As of last year, the ORP ES&Q assessment of the Contractor's design process has been transferred from ORP ES&Q to ORP AMWTP Engineering. This inspection note is provided by ORP ES&Q under their program to use in the oversight scheduled this year by Assistant Manager Waste Treatment Plant (AMWTP) Engineering. The scope of this note included the following:

Objective 1: Review and close to the degree possible, the outstanding ES&Q Findings and Assessment Follow-up Items (AFIs) associated with the design process and the configuration management process.

Objective 2: Review the existing documented Contractor oversight performed since the last design process assessment to determine areas for review by DOE ORP. These areas should include areas of weakness identified by BNI and areas which support the upcoming turnover process of systems including the readiness of the design process System Descriptions and configuration management databases as well as procedures involving design verification and turnover.

Objective 3: Review the BNI audits and management assessments for effectiveness of contractor oversight.

Summary of Results

Objective 1: The OSR/ES&Q programs identified a number of findings and follow-up items in the past, but the majority of these were resolved by the Contractor in 2003 with subsequent verification by the ORP in 2004. The only open Findings and Assessment Follow-up Items (AFIs) remaining with the design process and configuration management are A-04-ESQ-RPPWTP-011 (CM issues associated with the Component Information System (CIS) database tracked by BNI Corrective Action Report (CAR)-04-238 which is due to close April 4, 2005 and the OSR Design Process Findings initiated in 2002 (Findings IR-02-015-01/02/03), two of which are closed and the third (IR-02-015-01) submitted for closure. In addition, BNI has submitted the Price Anderson Closure Package for Non-Conformance Tracking System (NTS)-2003-0001.

The NTS-2003-0001 will be closed by an NTS evaluation report independent of this assessment note. This assessment note closes IR-02-015-01-FIN and AFI A-04-ESQ-RPP-011-A01 based on the analysis reported below.

Objective 2: The oversight review determined the major area of weakness identified by BNI was in design verification (DV). This area also had implications on design process procedures because of the recommendations of the independent oversight of design verification. After reviewing all oversight documentation by Engineering and Quality Assurance including the independent assessment of DV, the assessor concluded the design program continues to be compliant to the QAM with additional enhancements being performed to support DV for Operational Readiness Review (ORR).

The DOE recognizes the project is rapidly approaching the time when systems will be completed and will require a process and procedures to turnover from the Engineering Procure and Construct contract to the Commissioning and Test Organization (C&T). Because of the need to support future system turnovers, this assessment reviewed the design process tools presently in place to accomplish turnover of systems; specifically, the system descriptions (SD) with Test Acceptance Criteria (TAC), the design verification (DV) process used to verify the system design was correct and complete, the Configuration Management (CM) of system components at turnover and the turnover process procedures. The s concluded a great deal of time and effort was being expended preparing for the upcoming turnovers.

These efforts included:

- 1) A design verification path forward (DVPF) is being developed, which will involve procedure changes to the design process procedure(s) to include the verification of the design requirements for the system as recommended by BNI oversight reports. A Trend Report 24590-WTP-TN-03-01734 has been submitted to provide system design verification matrixes for the purpose of verifying the design inputs list in SDs are verified incorporated to the design to facilitate the Operational Readiness Review (ORR) effort at Hot Commissioning.
- 2) A draft turnover procedure from construction to startup has been developed and is presently in concurrence involving walk-downs, turnover package development, and system completion punch-lists.
- 3) C&T development of a draft turnover procedure from startup to operations and preparations to develop the startup test procedures using the TAC written in to the system descriptions.

The assessor concluded the BNI Design Process (including CM programs and databases) was compliant to the Quality Assurance Manual (QAM) with BNI now recognizing the need for additional program enhancements necessary to support the DOE ORR. It was noted BNI has completed an independent assessment of the design verification process which has identified issues and made numerous recommendations to deal with these issues.

Objective 3: BNI continued to provide excellent oversight by both Engineering and Quality Assurance (QA) through the use of offsite independent design verification assessments and annual QA design process audits. The last QA audit of engineering design process was the *Design Execution Audit* of January 4, 2004. Based on this audit and the results of the

independent design verification assessment conducted as a recommendation of the annual audit, the assessor concluded the BNI design process continued to improve, but some issues still remained in place. The DOE will continue to follow these areas including the Design Verification Process. DOE ORP recognized BNI had identified a design verification path forward (DVPF) and was in the process of correcting these issues. This DVPF will be tracked in the DOE ORP action item list and reviewed for implementation completion and effectiveness.

Scope of Assessment Effort

This note reviewed DOE Standard 3024 for system design descriptions, BNI procedures and guides associated with the generation of system descriptions, BNI procedures associated with turnovers from construction to startup, a sampling of two approved system descriptions, the BNI *Design Execution Audit*, and subsequent design verification independent assessment results. The assessor also conducted interviews with Engineering and Commissioning & Test (C&T) management and staff, to determine the effectiveness of the BNI design process including the Contractor's oversight of the process. The assessor also reviewed the BNI System Descriptions for the defined system design requirements including requirement identification and source, and the verification of the incorporation of the requirements to the design. The assessor also reviewed the maintenance of Configuration Management control of the design through the turnover process including the responsibility for maintaining the CM during the startup/commissioning programs.

Observations and Conclusions

Closure of Existing ES& Q Design Process and CM Findings and AFIs

The assessor reviewed the following documents:

- Closure Package for Finding A-02-015-01-FIN (CAR-04-216)
- Closure Package for AFI A-04-ESQ-RPPWTP-011-A-01 (CAR-04-238)
- Surveillance Report, 24590-WTP-SV-QA-03-779, dated December 15

The assessor reviewed the above Closure Package for Finding IR-02-015-01-FIN to verify the CAR-04-216 properly covered the issues in the Finding, the CAR actions were completed, and BNI QA had verified the completed actions using surveillance 24590-WTP-SV-QA-03-779, dated December 15. The assessor reviewed the CAR-04-216 and determined the wording of the statement of problem was a direct extract of the wording of the Finding IR-02-015-01-FIN and thus verified the DOE Finding was the source of the CAR wording. Hence, the Finding was properly captured in the CAR.

The assessor's review of both the closed CAR-04-216 and the surveillance SV-QA-03-779 determined the corrective action required the development of a procedure 24590-WTP-GPP-IT-013 "Protection of Project Data," which was approved and implemented on December 15, 2003. This procedure managed electronic WTP project data, and thus provided adequate the quality and reliability of the data input for its intended use. The ORP CM Management Assessment of August 2004 indicated the data issues of the six databases were resolved with the exception of the Component Identification System (CIS), which remained a problem as expressed in CAR-03-

144. Subsequently the Contractor performed a CIS Management Assessment and determined data was not always being properly entered to CIS with CAR-04-238 being initiated to ensure the data was entered to CIS by March 2005. The CAR-04-238 (CIS database) was closed and verified closed on April 7, 2004. The assessor's review of the closed CAR verified the missing data to CIS had been input to the system with a metric process in place to prevent recurrence.

The assessor concluded sufficient evidence was presented in the closure packages of Findings IR-02-015-01 to close the Finding. In addition the Assessment Follow-up Item AFI A-04-ESQ-RPPWTP-011-A01 (CIS data entry and quality) is closed based on the closure of CAR-04-238. Hence, DOE ORP is closing Finding IR-02-015-01-FIN and AFI A-04-ESQ-RPPWTP-011-A-01.

Design Process Review

The assessor reviewed the Contractor audit 24590-WTP-IAR-QA-04-010, Revision 1, *Design Execution Audit*, dated January 4, 2005, and determined two areas would be reviewed by DOE ORP for this period based on the problems identified in the design verification area and the suggested recommendation of the independent assessor. Those areas were the System Description and the Design Verification Process. The other areas of design process such as engineering drawing, field change request, field change notice and engineering calculations did not reflect problems are being closely monitored by the Facility Representative and the NTS Closure reports respectively.

1) System Description Review

The assessor reviewed the following documents:

- 24590-WTP-3YD-SHR-00001, Revision 0 of December 6, 2004 *System Description for WTP Reagents (SHR, NAR, AFR, SPR, STR, and SNR.)*
- 24590-HLW-3YD-HFP-00001, Revision 1 of December 22, 2004 *System Description for HLW Concentrate Receipt and Melter Feed Process System (HCP and HFP).*
- 24590-WTP -3DP-G04T-00903, Revision 4 *System Descriptions and Test Acceptance Criteria*, dated August 25, 2004.
- 24590-WTP-GPG-ENG-078, Revision 0, *Systems Descriptions Guide.*
- *DOE-STD-3024-98 Content of System Design Descriptions*, dated October 1998.
- CCN: 116525 of March 18, 2005 *Submittal of Independent Design Verification Assessment.*

The assessor reviewed the DOE Standard (STD)-3024 and compared it to the BNI System Description Guide GPG-ENG-078, to understand the purpose and depth of the SDs presently being generated versus the System Design Descriptions of the standard. In addition, two SDs were reviewed for implementation of the SD procedure and guide as well as the overall effectiveness of the SD to accomplish its intended purpose.

The assessor also interviewed the Engineering management responsible for the implementation and interpretation of the SD procedures and the subsequent implementation of the SDs.

The assessor determined there were two different procedures in the EDPI listings, one of which dealt with SDs and the other SDDs. The SD procedure specifically stated the contract does not require the SDD. The DOE STD-3024-98 states "The purpose of an SDD is to identify the requirements associated with SSCs, explain why the requirements exist (basis) and describe the features of the system description provided to meet those requirements." The BNI SD was controlled by procedure 3DP-G04T-00903 Revision 4 which states "This procedure covers the production of system descriptions and system level test acceptance criteria for RPP-WTP". The SD procedure has a requirement to list the design requirements or function of the SD and the guidance 24590-WTP-GPG-ENG-078, Revision 0, *Systems Descriptions Guide* does state SDs are intended to "Identify the bases of design requirements and facilitate the determination of impact of proposed changes." The SDs listed above did provide a listing of the system design requirements (with referenced locations of the source) based on a word search of the Design Criteria Database. The assessor concluded SDs are appropriate for this point in the project but because of the need for more detailed discussion on the basis of requirements needed to develop and maintain the Documentation Safety Analysis (DSA) in the post commissioning period, SDDs may need to be developed from the information collected both from the system description and the information collected as a result of the startup and commissioning program for the use by the M&O contractor in training, operation, and maintenance of the AB. This would require a contract modification.

The assessor determined a recent audit have been completed by the QA organization (24590-WTP-IAR-QA-04-010, Revision 1, *Design Execution Audit*, dated January 4, 2005), which had recommended an independent assessment of design verification be performed based on offsite experience and supporting the ORR process. The independent assessment was performed in September 2004.

The assessor reviewed the independent assessment report (CCN: 116525 of March 18, 2005 "*Submittal of Independent Design Verification Assessment*) *Executive Summary*, and determined 20 recommendations were submitted with the report. The results summary made several statements, which the assessor followed up with the BNI RPPWTP QA organization to determine if corrective actions were necessary. One of these was "...Design Verification is narrowly focused on the ITS SSCs capability to perform the safety function This does not appear to meet the requirement of QAM Paragraph 3.6, Design verification." Another statement was "As presently conducted, the DV process and records will not be supportive for ORR." The report questioned BNIs ability to verify the design input requirements were verified incorporation to the design at the system and major component level. The ability to verify the incorporation of design inputs would be necessary to satisfy the potential lines of inquiry which might be involved in a DOE Order 425.1 *Operational Readiness Review*. The assessor interviewed BNI QA to determine if this report identified any areas of non-compliance to the QAM. The BNI QA response was that BNI was in compliance to the QAM in the area of design verification, and nothing in the report changed this position. The assessor review of the report confirmed the compliance of the BNI program in the area of design verification, since there were procedures in place for design verification which were being implemented with exceptions noted in CARs. However, both BNI and the assessor recognized the merit of the report relative to the recommendations for the system based verification of design for ORR purposes. Based on this external report, the Engineering organization decided to begin a system design verification

matrix process and initiated a Trend Report to obtain funding to perform. It has not been decided yet the extent of the effort, which procedures would be revised, or when the process would complete relative to turnover but the path forward was being pursued with a date of April 15, 2005 offered as a tentative date when these issues would be clarified.

The assessor sampled two of the ten system descriptions presently approved with the Test Acceptance Criteria included. These sampled SDs were compliant to the procedure and listed the design input in section 4.0. The assessor sampled one of these requirements for matrix verification (SD 2459-HLW-3YD-HFP-0001 System Description for HLW Concentrate Receipt and Melter Feed process Systems (HCP/HFP) item 4.3.1.e). The requirement stated "The hydrogen mitigation purge system is design to maintain hydrogen concentrations in the vessel headspace below 1% by volume during normal operations, or 25% of the lower flammability limit and less than 4% by volume in accident conditions." The assessor was provided a sample Verification Information form listing how the verification was determined. The assessor concluded the process was adequate and the concept very helpful in understanding the design input requirements were input to the design, but the results were not yet final. The systems were not ready for turnover of the systems, allowing time for the system design verification to take place. In general, the SDs were seen as a work in progress with the design input being input to Section 4.0 of the SDs and design verification of these requirements to be in the design, in progress.

2) Configuration Management Review in Support of the Turnover Process

The assessor reviewed the status of the CIS corrective actions implemented by CAR 04-238. In addition, an interview was conducted with the CIS Program Manager and the Deputy Manager, Mechanical and Process Engineering to determine the readiness and utilization of CIS for system turnovers. The engineering organization reported the CIS database was current and accurate with metrics available to display this. The information was now being loaded to CIS in a timely manner. The C&T management stated CIS would not be used for the commissioning and startup personnel, but would have its data cross-loaded to the CMMS computer program, which was already being used for equipment maintenance. It was not known what would happen with the CM databases such as CIS at the end of the contract, but the data in them would be available as decisions are made for the Operations phase.

BNI Oversight Process and Effectiveness

The assessor reviewed the following documents:

- 24590-WTP-IAR-QA-04-010, Revision 1, *Design Execution Audit*, dated January 4, 2005;
- Report titled *Management Assessment: Design Verification*, Revision 0, dated March 17, 2005; and
- 24590-WTP-MAR-ENG-04-001, Revision 0, *RPP-WTP-System Descriptions*, dated May 3, 2004.

Management Assessments

The engineering management assessment MAR-ENG-04-001 was conducted between December 2003 and April 2004 and was focused on the system description. The purpose was to evaluate the content and level of detail for SD by identifying the users and information needs of the users. The assessment concluded the primary purpose of SDs was to provide an accurate narrative description of the design concept and also made six recommendations for further enhancement of the SDs. These recommendations included:

- 1) A revision of the procedure for SDs to specify new requirements, format, content and level of detail,
- 2) Develop and issue a guide describing SD content,
- 3) Incorporate the output of the Test and Acceptance Criteria (TAC) Pilot Program with the System Engineering upgrade process,
- 4) Consolidate SDs when feasible,
- 5) Establish a schedule for production, and
- 6) Defer the SD as a design document until SDs are a numbered revision, TACs have been incorporated, and the system is turned over.

The assessor review of the MA determined the SD customers included

- 1) Various engineering disciplines for design development,
- 2) Writers of equipment specifications and material requisitions,
- 3) E&NS for permits and PSAR input, C&I for the software functional specifications (SFS) requirements, and
- 4) C&T for development of operations, testing, procedures, and training.

Based on the need for a timely SD to support the development and approval of the SFS, ORP recommends the SDs to become a design document to the point of supporting the approval of the SFS prior to turnover of systems. This recommendation will be tracked by the ORP line organization.

Quality Assurance Audits

The Quality Assurance audit IAR-QA-04-010 was conducted in September 2004 and issued January 2005 with six Findings, nine Observations, and two recommendations. The overall conclusion was the engineering program was compliant and effective with noted exceptions. These annual QA audits continue to provide good insight to DOE relative to the progress and problems of the design process through the design and construction of the project.

The six Findings included the following issues:

- 1) Lack of Quality Class definition of instrumentation design documents such as P&IDs, V&IDs;
- 2) Supplier Disposition Requests not incorporated to Specification Change Notices in a timely fashion,
- 3) Lack of Design Verification Reports for ITS equipment that had been placed in an irrecoverable location,

- 4) Interim piping stress calculations not signed or approved but on record for use,
- 5) SD Report did not have evidence of ALARA review, and
- 6) An engineering specification was not revised with seven posted changes.

Of the Findings, ORP s noted the Design Verification deficiency denoted in CAR-04-160 was a repeat of a 2002 issue. RPPWTP QA recommended an independent offsite audit of Design Verification be performed because the different discipline Discipline Engineering Managers (DEMs) were implementing DV in different fashion and the lack of integrated of these DV might impact the overall DV on a system level basis. The offsite independent assessment of DV was performed and the recommendation forwarded to BNI engineering. The assessor attended a meeting between QA Manager and the Engineering Process Manager to understand how these recommendations would be issued and tracked for implementation. This was done by CCN: 116525 memo to S. L. Lynch on March 18, 2005, which closed RITS item 24590-WTP-RITS-04-909

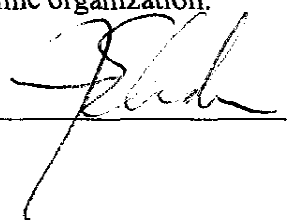
Results and Recommendations

Results

- This assessment note closes IR-02-015-01-FIN and AFI A-04-ESQ-RPP-011-A01.
- The BNI Design Process (including Configuration Management programs and databases) was compliant to the QAM with BNI now recognizing the need for additional program enhancements necessary to support the DOE ORR.
- The DOE will need to revisit the areas of Design Verification Process. DOE ORP recognizes BNI has identified a design verification path forward (DVPF) and is in the process of correcting these issues. This DVPF will be tracked in the DOE ORP action item list and reviewed for implementation completion and effectiveness at the next design process assessment.

Recommendations

- SDDs may need to be developed from the information collected both from the design system description and the information collected as a result of the startup and commissioning program to support the approval of the DSA and for the use by the M&O contractor in training, operation, and maintenance of the AB. This would require a contract modification.
- ORP recommends the SDs to become a design document at the point of supporting the approval of the SFS prior to turnover of systems. This recommendation with be tracked by the ORP line organization.

Signed:  Date: 05/19/05

Task# ORP-WTP-2005-0125

E-STARSM Report
Task Detail Report
06/14/2005 0942

TASK INFORMATION

Task#	ORP-WTP-2005-0125		
Subject	CONCUR: (05-WED-022) TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: REVIEW OF CONTACTOR PROCESS FOR PRODUCING SYSTEM DESCRIPTIONS, D-05-DESIGN-010		
Parent Task#		Status	CLOSED
Reference	05-WED-022 / CARS 7658	Due	
Originator	Almaraz, Angela	Priority	High
Originator Phone	(509) 376-9025	Category	None
Origination Date	05/09/2005 1106	Generic1	
Remote Task#		Generic2	
Deliverable	None	Generic3	
Class	None	View Permissions	Normal

Instructions Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you.

- bcc:
MGR RDG File
WTP OFF File
J. E. Adams, ESQ
J. J. Short, OPA
J. J. Davis, WED
W. F. Hamel, WED
J. E. Orchard, WED
M. L. Ramsay, WED
J. R. Eschenberg, WTP

ROUTING LISTS

1	Route List	Inactive
	<ul style="list-style-type: none"> Orchard, John E - Review - Concur with comments - 06/02/2005 1238 <i>Instructions:</i> Ramsay, Mark L - Review - Concur with comments - 06/02/2005 1238 <i>Instructions:</i> Davis, Jim J - Review - Concur - 06/03/2005 0751 <i>Instructions:</i> Adams, Jim E - Review - Concur with comments - 05/09/2005 1315 <i>Instructions:</i> Hamel, William F - Review - Concur with comments - 06/02/2005 1239 <i>Instructions:</i> Eschenberg, John R - Review - Concur - 06/07/2005 0756 <i>Instructions:</i> Schepens, Roy J - Approve - Approved with comments - 06/14/2005 0755 <i>Instructions:</i> Short, Jeff J - Review - Concur with comments - 06/06/2005 1430 	

RECEIVED

JUN 14 2005

DOE-ORP/ORPCC

Task# ORP-WTP-2005-0125

Instructions:

ATTACHMENTS

- | | |
|-------------|--|
| Attachments | 1. 05-WED-022 JEO Attach Rev 3.doc |
| | 2. 05-WED-022.JEO.Design Oversight.doc |

COLLABORATION

COMMENTS

- | | |
|---------------|---|
| Poster | Adams, Jim E (Adams, Jim E) - 05/09/2005 0105 |
| | Concur |
| | Comment. Page i, last paragraph. Need to change the statement "The Design Oversight, via the Assessment Note in Appendix C, closed the last open Finding on the Design Process and the last open AFI on the Design Process, and..." to "closed the last open Finding on the Design Process, the last open AFI on the Configuration Management Process, and ..." |
| | Suggestion: page 4, last paragraph, spell out the first SFS for clarity at this point. |
| Poster | Orchard, John E (Almaraz, Angela) - 06/02/2005 1206 |
| | Concur |
| | Orchard signed the hard copy on 5/19/05. |
| Poster | Ramsay, Mark L (Almaraz, Angela) - 06/02/2005 1206 |
| | Concur |
| | Ramsay signed the hard copy on 5/19/05. |
| Poster | Hamel, William F (Almaraz, Angela) - 06/02/2005 1206 |
| | Concur |
| | Hamel signed the hard copy on 5/27/05 |
| Poster | Short, Jeff J (Short, Jeff J) - 06/06/2005 0206 |
| | Concur |
| | I suggest adding release language such as: "nothing in this letter should be construed as changing the subject contract." |
| | Does ORP PD 220.1-12 define "recommendation"? The OSR procedure on assessments defines "finding", "observation" and "AFI". I note that the subject letter closed an AFI, so the AMWTP procedure (220.1-12) seems to be related to the OSR procedure. |
| Poster | Schepens, Roy J (Deutsch, V Genie) - 06/14/2005 0706 |
| | Approve |
| | Shirley Olinger signed for Schepens. |

TASK DUE DATE HISTORY

No Due Date History

SUB TASK HISTORY

No Subtasks

-- end of report --

Task# ORP-WTP-2005-0125

E-STARS™ Report
Task Detail Report
06/02/2005 0300

TASK INFORMATION

Task#	ORP-WTP-2005-0125		
Subject	CONCUR: (05-WED-022) TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: REVIEW OF CONTACTOR PROCESS FOR PRODUCING SYSTEM DESCRIPTIONS, D-05-DESIGN-010		
Parent Task#		Status	Open
Reference	05-WED-022 / CARS 7658	Due	
Originator	Almaraz, Angela	Priority	High
Originator Phone	(509) 376-9025	Category	None
Origination Date	05/09/2005 1106	Generic1	
Remote Task#		Generic2	
Deliverable	None	Generic3	
Class	None	View Permissions	Normal
Instructions	<p>Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you.</p> <p>bcc: MGR RDG File WTP OFF File J. E. Adams, ESQ J. J. Short, OPA J. J. Davis, WED W. F. Hamel, WED J. E. Orchard, WED M. L. Ramsay, WED J. R. Eschenberg, WTP</p>		

ROUTING LISTS

1	Route List	Active
	<ul style="list-style-type: none"> Orchard, John E - Review - Concur with comments - 06/02/2005 1238 <i>Instructions:</i> Ramsay, Mark L - Review - Concur with comments - 06/02/2005 1238 <i>Instructions:</i> Davis, Jim J - Review - Awaiting Response <i>See previous concurrence page</i> <i>Instructions:</i> Adams, Jim E - Review - Concur with comments - 05/09/2005 1315 <i>Instructions:</i> Hamel, William F - Review - Concur with comments - 06/02/2005 1239 <i>Instructions:</i> Eschenberg, John R - Review - Awaiting Response <i>6/6 on JEM</i> <i>Instructions:</i> Schepens, Roy J - Approve - Awaiting Response <i>6/13</i> <i>Instructions:</i> Short, Jeff J - Review - Awaiting Response <i>6/6/05 with comments</i> 	

Task# ORP-WTP-2005-0125

ATTACHMENTS

Attachments 1. 05-WED-022.JEO.Attach.doc
 2. 05-WED-022.JEO.Design Oversight.doc

COLLABORATION

COMMENTS

Poster ~~Almaraz, John E (Almaraz, John E)~~ - 05/09/2005 0105

Concur

~~Comment: Page 4, last paragraph. Need to change the statement "The Design Oversight, via the Assessment Note in Appendix C, closed the last open Finding on the Design Process and the last open AFI of the Design Process; and..." to "closed the last open Finding on the Design Process, the last open AFI on the Configuration Management Process; and..."~~

~~Suggestion: page 4, last paragraph, spell out the first SPS for clarity at this point.~~

Poster Orchard, John E (Almaraz, Angela) - 06/02/2005 1206

Concur

Orchard signed the hard copy on 5/19/05.

Poster Ramsay, Mark L (Almaraz, Angela) - 06/02/2005 1206

Concur

Ramsay signed the hard copy on 5/19/05.

Poster Hamel, William F (Almaraz, Angela) - 06/02/2005 1206

Concur

Hamel signed the hard copy on 5/27/05

Poster ~~Short, Jeff J (Short, Jeff J)~~ - 06/06/2005 0206

Concur

~~I request adding the language such as: "nothing shall be construed as changing the subject contract."~~

~~Can you also define "recommendation"? The QSR procedure on assessments defines "finding", "observation" and "AFI". I note that the subject letter closed an AFI, so the AMWTP procedure (220.1-12) seems to be related to the QSR procedure.~~

comment closed - J. Short

TASK DUE DATE HISTORY
No Due Date History

SUB TASK HISTORY
No Subtasks

-- end of report --






Task# ORP-WTP-2005-0125

E-STARS™ Report
Task Detail Report
05/09/2005 1110

TASK INFORMATION

Task#	ORP-WTP-2005-0125		
Subject	CONCUR: (05-WED-022) TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT: REVIEW OF CONTACTOR PROCESS FOR PRODUCING SYSTEM DESCRIPTIONS, D-05-DESIGN-010		
Parent Task#		Status	Open
Reference	05-WED-022 / CARS 7658	Due	
Originator	Almaraz, Angela	Priority	High
Originator Phone	(509) 376-9025	Category	None
Origination Date	05/09/2005 1106	Generic1	
Remote Task#		Generic2	
Deliverable	None	Generic3	
Class	None	View Permissions	Normal
Instructions	<p>Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you.</p> <p>bcc: MGR RDG File WTP OFF File J. E. Adams, ESQ J. J. Short, OPA J. J. Davis, WED W. F. Hamel, WED J. E. Orchard, WED M. L. Ramsay, WED J. R. Eschenberg, WTP</p>		

ROUTING LISTS

1	Route List	Active
	<ul style="list-style-type: none"> Orchard, John E - Review - Awaiting Response <i>Instructions:</i> 	 5/19/05
	<ul style="list-style-type: none"> Ramsay, Mark L - Review - Awaiting Response <i>Instructions:</i> 	 5/19/05
	<ul style="list-style-type: none"> Davis, Jim J - Review - Awaiting Response <i>Instructions:</i> 	 5/19/05
	<ul style="list-style-type: none"> Adams, Jim E - Review - Awaiting Response <i>Instructions:</i> 	 5/19/05
	<ul style="list-style-type: none"> Hamel, William F - Review - Awaiting Response <i>Instructions:</i> 	 5/21/05
	<ul style="list-style-type: none"> Eschenberg, John R - Review - Awaiting Response <i>Instructions:</i> 	
	<ul style="list-style-type: none"> Schepens, Roy J - Approve - Awaiting Response <i>Instructions:</i> 	

ATTACHMENTS