U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

03-OSR-0136

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
2435 Stevens Center
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – PRETREATMENT FACILITY CONSTRUCTION AUTHORIZATION READINESS INSPECTION REPORT A-03-OSR-RPPWTP-011

Reference: ORP letter from R. J. Schepens to R. F. Naventi, BNI, "U.S. Department of Energy (DOE) Notice to Proceed with Pretreatment Construction Activities," 03-OSR-0021, dated March 17, 2003.

This letter forwards the results of the DOE Office of River Protection (ORP) review of Bechtel National, Inc. (BNI) pretreatment facility construction authorization readiness and engineering performance on the Waste Treatment and Immobilization Plant during the period March 3 through 13, 2003. Enclosure 1 documents one Finding regarding two instances of failure to document discrepancies using Corrective Action Reports, as required by BNI procedures. Complete details of the inspection are documented in the enclosed inspection report, Enclosure 2.

Inspection activities included assessing BNI's readiness for pretreatment construction authorization and the adequacy of your implementation of corrective actions to improve the performance of engineering work.

The inspection team found BNI's assessment of readiness for full pretreatment facility construction authorization was adequately supported and demonstrated a clear understanding of the issues regarding the performance of engineering work. BNI had initiated extensive corrective actions to improve engineering work performance. Because these corrective actions had been implemented recently, the inspection team could not assess their effectiveness. BNI is urged to aggressively monitor the effectiveness of the corrective actions taken to improve engineering work performance and thus develop a high level of assurance that past and future engineering work conforms to established performance and acceptance criteria.

To provide ORP assurance the corrective actions have been effective, BNI agreed to perform a thorough assessment of the effectiveness of engineering work performance improvement initiatives for all disciplines performing engineering design work and submit the assessment

results and any needed corrective actions before the first update of the Preliminary Safety Analysis Report. ORP documented this agreement in ORP/OSR-2003-01, *Construction Authorization Agreement Between the U.S. Department of Energy and Bechtel National, Inc.*, Conditions of Acceptance, Section 6.3.2, *SRD and ISMP Acceptability and Compliance*, Condition 2, submitted to BNI in the Reference.

Based upon this and previous inspections, ORP has confidence pretreatment facility construction activities will be accomplished in accordance with authorization basis requirements.

If you have any questions, please contact me, or your staff may contact Robert C. Barr, WTP Safety Regulation Division, (509) 376-7851.

Sincerely,

Roy J. Schepens
Manager

OSR:PPC

Enclosures (2)

cc w/encls:
W. R. Spezialetti, BNI

NOTICE OF FINDING
U.S. Department of Energy (DOE)
Office of River Protection
Pretreatment Facility Construction Authorization Readiness Inspection

Standard 7, "Environment, Safety, Quality, and Health," of Contract DE-AC27-01RV14136, dated December 11, 2000, between Bechtel National, Inc. (the Contractor) and the DOE, defined the Contractor's responsibilities under the Contract as they related to conventional non-radiological worker safety and health; radiological, nuclear, and process safety; environmental protection; and quality assurance.

Standard 7, Section (e)(2)(ii) of the Contract required the Contractor to comply with the specific nuclear regulations defined in the effective rules of the 10 Code of Federal Regulations (CFR) 800 series of nuclear requirements.

Title 10 CFR 830, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements," required the Contractor to conduct work in accordance with the requirements of Subpart A and to develop a Quality Assurance (QA) Program that reflected the requirements of Subpart A.

The Contractor's QA Program was defined in 24590-WTP-QAM-QA-01-001, "Quality Assurance Manual," Rev. 0, dated August 2001 (QAM).

The Contractor's QAM Policy Q-05.1, "Instructions, Procedures, and Drawings," Section 3.1.1, states that "Activities affecting quality shall be prescribed by and performed in accordance with documented instructions, procedures, and drawings of the type appropriate to the circumstances that include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished."

Procedure 24590-WTP-GPP-QA-601, *Quality Assurance Surveillance*, Revision 1, dated August 22, 2002, required in Section 3.5.3, "Document any identified conditions adverse to quality (deficiencies) on a Corrective Action Report in accordance with 24590-WTP-GPP-QA-201, "Corrective Action" or a Nonconformance Report (NCR) in accordance with 24590-WTP-GPP-CON-7104, "Nonconformance Reporting and Control." The Corrective Action procedure, Section 2.0, prescribed, "Deficiencies identified during audits, surveillances, or assessments shall be documented using a Corrective Action Report and tracked through closure."

Procedure 24590-WTP-3DP-G04B-00046, *Engineering Drawings,* Revision 4, dated February 7, 2003, Section 3.5.4, required "All outstanding design change control documents (Design Change Notices, Field Change Requests [FCR], Field Change Notices) and other design changes approved for incorporation (Supplier Disposition Deviation Requests, NCRs) shall be incorporated into the associated drawing, by drawing revision, anytime one of the following occurs: The drawing is revised and reissued for any reason; application to multi-sheet drawings require incorporation of only those change documents affecting the particular sheets being issued," and "In the revision block, the revision description shall identify (by document number) all design change control documents and other approved design changes incorporated."

During the performance of this inspection of the actions completed to improve engineering performance within the period March 3 through 13, 2003, at the Contractor's engineering offices, the following were identified:

1. The Contractor had not written a Corrective Action Report to document the conditions adverse to quality identified during surveillances, to verify the conformance of engineering calculations to procedure requirements, of calculations performed during November 2002, December 2002, and January 2003.

2. The Contractor had not written a Corrective Action Report to document the failure to incorporate seven FCRs into the next revision of the drawing, as documented in an electronic mail dated March 4, 2003, from the Configuration Management Supervisor to the Systems Engineering Manager; and the failure to incorporate one FCR into the next revision of the drawing, and reference three FCRs in the revision block of the new drawing revision, as identified in an electronic mail dated November 26, 2002, from the Configuration Management Supervisor to the Manager, Engineering Process, Procedures and Personnel.

This is an inspection Finding (A-03-OSR-RPPWTP-011-01-FIN).

The ORP requests that the Contractor provide, within 30 days of the date of the cover letter that transmitted this Notice, a reply to the Findings above. The reply should include: (1) admission or denial of the 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 in your authorization bases will be achieved. Where good cause is shown, consideration will be given to extending the requested response time.

Enclosure 2
03-OSR-0136
A-03-OSR-RPPWTP-011

INSPECTION REPORT
U.S. DEPARTMENT OF ENERGY
Office of River Protection
WTP Safety Regulation Division

INSPECTION:	Pretreatment Facility Construction Authorization Readiness Inspection Report for the Period March 3-13, 2003
REPORT NO:	A-03-OSR-RPPWTP-011
FACILITY:	Bechtel National, Inc.
LOCATION:	2435 Stevens Center Richland, Washington 99352
DATES:	March 3-13, 2003
INSPECTORS:	P. Carier, Inspection Lead M. Evarts, Consultant D. Kirsch, Consultant
APPROVED BY:	P. Carier, Verification and Confirmation Official WTP Safety Regulation Division

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EXECUTIVE SUMMARY
Pretreatment Facility Construction Authorization Assessment Inspection Report
March 3-13, 2003

INTRODUCTION

This inspection of Bechtel National, Inc. (the Contractor) activities covered the following specific areas:

- Adequacy of the Contractor's Assessment of Pretreatment Facility Construction Authorization Readiness (Section 1.2)
- Adequacy of the Contractor's Design Drawings Issued for Construction (Section 1.3)
- Adequacy of Calculation Improvement Corrective Actions (Section 1.4)
- Adequacy of Design Input Memorandum Improvement Corrective Actions (Section 1.5)
- Adequacy of Supplier Deviation Disposition Request Improvement Corrective Actions (Section 1.6)
- Adequacy of Configuration Management Improvement Corrective Actions (Section 1.7)
- Adequacy of Corrective Actions to Improve performance in Authorization Basis Conformance (Section 1.8)
- Adequacy of Contractor's Actions to Manage and Monitor Engineering Performance Corrective Actions (Section 1.9)

Significant Observations and Conclusions:

- The inspectors concluded the Contractor's assessment of readiness for full pretreatment facility construction authorization was adequately supported and demonstrated an understanding of the issues regarding the performance of engineering work. The Contractor had initiated numerous corrective actions necessary to improve engineering work performance. The inspectors concluded the Contractor's corrective actions were in the early stages of implementation and just beginning to effect improvement in the performance of engineering work. However, the inspectors further concluded it was early in the improvement program execution for demonstrable, conclusive evidence of corrective action effectiveness. Based upon the results of previous inspections, the results of this inspection conducted to evaluate the thoroughness of the Contractor's consideration of their readiness for full construction authorization, and previous assessments of Contractor readiness to perform important-to-safety activities, the inspectors developed confidence the pretreatment facility construction activities, authorized by full Construction Authorization, would be accomplished in accordance with Authorization Basis requirements. (Section 1.2)

- Inspectors concluded problems remained regarding calculation conformance with procedure requirements and the completion of acceptable Authorization Basis conformance screening of designs. This observation was based upon a review of seven pretreatment facility design drawings, the associated Design Input Memorandum (DIM) and calculations. The inspectors found the problems had been previously identified by either the Contractor or the Office of River Protection and corrective actions were in progress. No new problems were identified. All calculations had been converted to Committed Preliminary, in accordance with commitments specified by the Contractor in their letter dated October 30, 2002. (Section 1.3)

- The inspectors concluded the Contractor had completed implementing the corrective actions applicable to calculations. The inspectors found, although improvement initiatives had been instituted, the effectiveness of the initiatives could not be clearly demonstrated. The inspectors found it was early in the implementation phase to establish a clear improving trend in the quality of calculation performance and checking or in the correction of previously identified deficiencies. The inspectors identified one Finding regarding failure to take adequate corrective action as required by procedure (Finding A-03-OSR-RPPWTP-011-01-FIN). (Section 1.4)

- The inspectors concluded the Contractor had completed implementing the corrective actions applicable to DIM improvement. However, based upon the inspectors' conclusions developed during the inspections of Pretreatment design documents, the inspectors concluded the effectiveness of the Contractor's corrective actions had not been conclusively demonstrated because problems were still evident in DIM execution. (Section 1.5)

- The Contractor had completed implementing the actions to improve Supplier Deviation Disposition Request process execution in accordance with specified commitments. However, it was early in the implementation phase to demonstrate a clear improving trend. (Section 1.6)

- The Contractor had implemented the committed corrective action processes, training, and management assessments resulting from their internal performance improvement initiatives in the area of configuration management. The Contractor was self-identifying issues in this area and had demonstrated some improvement. The new processes had only been in place for a few weeks; accordingly, it was too early to conclude the Contractor's corrective actions in the area of configuration management were effective. The inspectors identified one Finding involving failure to take adequate corrective action as required by procedure (Finding A-03-OSR-RPPWTP-011-01-FIN). (Section 1.7)

- The inspectors concluded the Contractor had completed implementing the corrective actions, applicable to authorization basis conformance, identified by the Quality Action List, Section AB. The inspectors found, although improvement initiatives had been instituted, the effectiveness of the initiatives could not be clearly demonstrated. The inspectors found it was too early in the implementation phase to establish a clear improving trend in the quality of authorization basis conformance. (Section 1.8)

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PRETREATMENT (PT) FACILITY CONSTRUCTION AUTHORIZATION READINESS INSPECTION REPORT

1.0 REPORT DETAILS

1.1 Introduction

This inspection assessed the Contractor's readiness for PT Facility construction authorization. The Contractor's important-to-safety (ITS) activities in the areas of engineering performance (calculation adequacy, design performance, configuration management, Authorization Basis conformance, and corrective action program performance, among others discussed in the below sections) were examined to assess the adequacy of corrective actions to improve engineering work performance. The inspectors examined the adequacy of design activities for selected PT Facility designs by examining design drawings, supporting calculations, and supporting Design Input Memorandums. These activities were assessed to determine the degree of conformance with the Contractor's Quality Assurance (QA) and Quality Control (QC) programs, and engineering programs and procedures for performing engineering work.

Details and conclusions regarding this inspection are described below.

1.2 Adequacy of the Contractor's Assessment of Pretreatment Facility Construction Authorization Readiness (ITP I-135)

1.2.1 Inspection Scope

The inspectors assessed the adequacy of the Contractor's assessment of readiness for PT Facility full Construction Authorization, from the perspective of readiness to perform ITS construction activities related to the construction of the Waste Treatment and Immobilization Plant (WTP), by examining the readiness of the Engineering, QA and Construction organizations. The inspectors reviewed the Contractor's self-assessment report, verified the status of certain acknowledged problem areas, examined the corrective actions to improve performance in several areas, and interviewed Contractor management and staff.

1.2.2 Observations and Assessments

The Office of River Protection (ORP) performed several activities over the past two years that provided a basis for confidence in the ability of the Contractor to conduct ITS work activities.

The ORP implemented a program for inspection of the Contractor's conformance to the authorization basis at the start of the Contract[1] in December 2000, through present. Thirty-four inspections have been completed to date. ORP documented the results of each inspection in an inspection report issued to the Contractor and the reports are available on the ORP WTP Safety

[1] Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., dated December 11, 2000.

Regulation Division website for the public to review. For example, the ORP examined the Contractor's activities in support of soils (ITS building foundation) excavation, backfill, and compaction; installation of forms, reinforcing steel, and embedments; ITS concrete production; and concrete placement. The ORP also examined the Contractor's programs, procedures, and implementation of a broad range of design and construction activities; for example, standards implementation, configuration control, design implementation, quality assurance performance, design drawing completion and implementation, management assessments, personnel training, field engineering performance, quality control performance, records management, industrial health and safety, and construction management. Each inspection report provided a conclusion regarding the degree of conformance to the specified requirements and the basis for the conclusion. With the exception of engineering work performance, discussed later, results from the implementation of the inspection program had established confidence, even though isolated issues of noncompliance were identified, the Contractor was substantially in conformance with the authorization basis requirements in the areas evaluated during the execution of the inspection program.

In addition, the ORP examined the Contractor's readiness to proceed with certain work activities during several previous inspections. During the first readiness review, the ORP examined the Contractor's readiness to proceed with activities effecting firewater piping installation and soil excavation for ITS building foundations and documented the results in Inspection Report IR-01-004.[2] The first readiness review extensively examined the programs and implementation in the areas of quality assurance, quality control, records generation and storage, training and qualification of craft and inspection personnel, occurrence reporting, and emergency preparedness. These extensive programmatic inspections formed the foundation upon which other readiness reviews, conducted later, were based. Accordingly, subsequent readiness assessments focused more on the adequacy of readiness preparations for the specific work activity. The ORP examined the Contractor's readiness to proceed with soil backfill and compaction activities for ITS building foundations and documented the results in Inspection Report IR-01-008.[3] The Contractor's readiness to proceed with the installation of forms, rebar and embedments for ITS buildings was examined by ORP and documented in Inspection Report IR-02-004.[4] Further, the Contractor's readiness to proceed with ITS structural concrete installation was examined by ORP and documented in ORP Inspection Report IR-02-008.[5] Additional inspections related to verification of readiness to proceed with ITS reinforcing steel and structural concrete installation were conducted by ORP and documented in Inspection Reports IR-02-005,[6] and IR-02-011.[7] The ORP examined the Contractor's readiness for full

[2] ORP letter from R. C. Barr to R. F. Naventi, BNI, "Phase A, Limited Construction Readiness Inspection Report, IR-01-004," 01-OSR-0391, dated October 23, 2001.
[3] ORP letter from R. C. Barr to R. F. Naventi, BNI, "Phase B, Limited Construction Readiness Inspection Report, IR-01-008," 01-OSR-0498, dated December 14, 2001.
[4] ORP letter from R. C. Barr to R. F. Naventi, BNI, "Inspection Report IR-02-004 – On-Location Inspection Report for the Period February 25, through April 11, 2002," 02-OSR-0174, dated May 3, 2002.
[5] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Inspection Report IR-02-008 – On-Location Inspection Report for the Period May 24 through July 16, 2002, Including an Assessment of Contractor Readiness to Perform Partial Construction Authorization Activities," 02-OSR-0352, dated August 26, 2002.
[6] ORP letter from R. C. Barr to R. F. Naventi, BNI, "Inspection Report IR-02-005 – On-Location Inspection Report for the Period April 12, through May 23, 2002," 02-OSR-0231, dated June 11, 2002.
[7] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Inspection Report IR-02-011 – On-Location Inspection Report for the Period July 17, through August 23, 2002," 02-OSR-0426, dated September 13, 2002.

construction authorization on the Low Activity Waste (LAW) and High Level Waste (HLW) facilities and documented the results in Inspection Report A-03-OSR-RPPWTP-002.[8]

Although, in some cases, the Contractor had not completed all of the preparations for the readiness activity being assessed, the inspectors concluded the Contractor had developed a clear understanding of the work activities necessary to complete their preparations and had established the necessary management systems and programs to ensure the accomplishment of the ITS activity in accordance with Authorization Basis (QA Program, Safety Requirements Document, Integrated Safety Management Program) requirements prior to beginning the assessment topic activity.

Inspection reports IR-02-003[9] and IR-02-010[10] documented the results of previous inspections of the implementation of the Contractors QC and QA programs. The inspections found the Contractor's implementation of the programs met the QA Manual, Inspections, Independent Assessment (Audit), and QA Surveillance requirements, and the QA Requirements for Nuclear Facilities standards.

Recent Office of River Protection (ORP) inspections (in the areas of configuration management, standards selection, standards implementation, and design process implementation) also identified problems with the performance of engineering work, confirming the continuing nature of engineering work performance problems.

The Contractor had performed a root cause analysis of the engineering problems; staffed, in part, with QA oversight by an experienced root cause analyst and overseen by an individual qualified in the techniques and performance of root cause analysis. The Contractor was notified of concerns regarding the performance of engineering work by letter dated October 4, 2002[11] and stated the Contractor must demonstrate their plans and actions had comprehensively addressed the design process issues in order for ORP to conclude they were ready for construction. The Contractor met with the ORP on October 7, 2002, and presented their analysis of the engineering performance problems and identified compensatory measures and corrective actions. The Contractor provided ORP with a letter dated October 30, 2002[12] identifying their evaluation of the engineering performance problems, actions to investigate and mitigate the root causes for the deficiencies identified by the October 4, 2002, letter, the actions to resolve the issues and prevent recurrence, and their justification of readiness for Construction Authorization.

The ORP reviewed the Contractor's evaluations, provided by the October 30, 2002, letter, and concluded the evaluations and the proposed corrective actions were adequate. The ORP

[8] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Inspection Report A-03-OSR-RPPWTP-002 – Construction Authorization Request Readiness Inspection," 02-OSR-0586, dated December 10, 2002.
[9] ORP letter from R. C. Barr to R. F. Naventi, BNI, "Inspection Report IR-02-003 – Quality Control, Control of Special Processes, and Control of Measuring and Test Equipment Assessment," 02-OSR-0147, dated April 11, 2002.
[10] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Quality Assurance (QA) Assessment Inspection Report, IR-02-010," 02-OSR-0363, dated September 19, 2002.
[11] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Notification of Construction Authorization Readiness Assessment and Associated Concerns," 02-OSR-0480, dated October 4, 2002.
[12] BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Hanford Tank Waste Treatment and Immobilization Plant – Construction Authorization Readiness in Consideration of Recent Assessments and Inspections of Engineering Activities," CCN-042775, dated October 30, 2002.

conducted inspections (documented in inspection report A-03-OSR-RPPWTP-002[13]) during the period of September 30 to November 7, 2002, to assess the actions taken to address the concerns identified by the October 4, 2002, ORP letter, and concluded the Contractor's implementation of the proposed corrective actions were adequate to support the full construction authorization for the HLW and LAW facilities. The ORP provided these conclusions to the Contractor by letter dated November 13, 2002,[14] with the condition the corrective actions identified by the Contractor's October 30, 2002, letter be completed by the dates provided in the letter.

The ORP provided the Safety Evaluation Report (SER), of the Contractor's LAW, HLW, Pretreatment (PT), and Balance of Facilities (BOF) construction authorization request, by letter dated November 13, 2002.[15] The SER, provided by this letter, supported issuance of authorization, with conditions, for full construction of the LAW facility; full construction of the HLW facility; construction of the PT facility pits, tunnels and basemat; and construction of selected portions of the BOF structures. The ORP provided the Contractor with authorization to proceed with these construction activities and the conditions of acceptance.

On February 26, 2003,[16] the Contractor notified the ORP of their declaration of readiness to proceed with full PT Facility Construction Authorization (CA) activities. The assessment included a review of a broad range of areas associated with the initiatives to improve engineering work performance. In addition, the Contractor concluded pretreatment facility design had progressed to a maturity demonstrating readiness to begin full construction work activities. The Contractor's assessment presented the status of a broad range of initiatives to improve performance in design control and implementation. The February 26, 2003, letter provided, as an attachment, the Contractor's engineering readiness assessment for pretreatment facility design activities under full construction authorization and identified four open items, and several open Corrective Action Reports (CARs), and concluded these CARs would not impact their declaration of readiness for CA. The inspectors examined the basis for the Contractor's conclusion, regarding the implementation of performance improvement initiatives and the issues identified by the CARs, to determine whether the conclusion was adequately supported; the results of these examinations are documented below.

The inspectors examined the status of the four areas requiring further action and attention, identified by the Contractor in their February 26, 2003, letter.

- Improve authorization basis compliance reviews.

  The inspectors examined Corrective Action Reports (CAR) 24590-WTP-CAR-QA-03-012, 03-020, 03-025 and 03-029 and found the CARs specified corrective actions had not been completed. The CARs identified additional examples where the Contractor's authorization basis change process was not being followed. The inspectors found the

[13] Ibid 8.
[14] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Review of Bechtel National, Inc. (BNI) Response to Office of River Protection (ORP) Engineering Concerns," 02-OSR-0566, dated November 13, 2002.
[15] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Safety Evaluation Report (SER) of the Low Activity Waste (LAW), High Level Waste (HLW), Pretreatment (PT), and Balance of Facilities (BOF) Construction Authorization Request (CAR)," 02-OSR-0518, dated November 13, 2002.
[16] BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Readiness for Waste Treatment and Immobilization Plant (WTP) Pretreatment Facility Full Construction," CCN-048490, dated February 26, 2003.

examples identified in the CARs were similar to the ones previously identified by the Contractor and ORP. Non-compliances with the AB change process resulted in four Findings during a recently performed ORP inspection, Inspection Report A-03-OSR-RPPWTP-007.[17] The Contractor's Finding responses and associated corrective actions were recently submitted to ORP and found acceptable.[18] The effectiveness of the Contractor's corrective actions in this area will be examined by ORP during future inspections.

- Improve timeliness of reviews.

  The inspectors examined Corrective Action Reports (CAR) 24590-WTP-CAR-QA-02-299, 03-023, and 03-043 and found the CAR specified corrective actions had not been completed. The Contractor's actions to improve timeliness of engineering reviews had not been completed, although corrective actions were underway. The issues involved issuing design documents for procurement and construction prior to completion of the required reviews of the Bechtel corporate Chief Engineer.

- Improve documentation of changes in design documents

  The inspectors determined the status of this issue was as stated by the Contractor in their February 26, 2003,[19] letter and corrective actions were underway. The inspector's examinations of incorporation of Field Change Requests into design drawing revisions, documented in Section 1.7.2 of this report, demonstrated additional work remains to correct deficiencies in this area.

- Ensure the quality of the design inputs from source documents and databases.

  The inspectors examined CAR 24590-WTP-CAR-QA-03-007 and found the corrective actions were still underway. The inspectors examined the specified corrective actions and found them to be comprehensive.

The February 26, 2003 letter[20] provided, as an attachment, the Contractor's Quality Action List (QAL) identifying corrective actions implemented in the engineering performance areas of calculations, Design Input Memorandums (DIM), Supplier Disposition Deviation Requests (SDDR), Configuration management (CM), authorization basis (AB) implementation improvement, and managing and monitoring the effectiveness of corrective actions. The Contractor's activities effecting improvements in the QAL areas have been discussed in other sections of this report.

Based upon the results of previous ORP inspections of Contractor performance, previous examinations of Contractor readiness, and the Contractor's corrective actions to improve

[17] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Authorization Basis (AB) Management Assessment Inspection Report, A-03-OSR-RPPWTP-007, Conducted January 6, 2003, through January 15, 2003," 03-OSR-0033, dated February 7, 2003.
[18] BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Bechtel National, Inc.'s Response to Inspection Report A-03-OSR-RPPWTP-007 – Authorization Basis Management Assessment," CCN-051759, dated March 12, 2003.
[19] Ibid 15.
[20] Ibid 15.

engineering work performance, the inspectors concluded the Contractor had provided assurance and confidence the necessary management systems, programs, and procedures were available and in place prior to implementing future construction activities.

1.2.3 Conclusions

The inspectors concluded the Contractor's assessment of readiness for full PT Facility construction authorization was adequately supported and demonstrated an understanding of the issues regarding the performance of engineering work. The Contractor had instituted numerous corrective actions necessary to improve engineering work performance. The inspectors concluded, based upon the results of inspections documented below, the Contractor's corrective actions were in the early stages of implementation and just beginning to effect improvement in the performance of engineering work. However, the inspectors further concluded it was early in the improvement program execution for substantial, conclusive evidence of corrective action effectiveness. Based upon the results of previous inspections, the results of this inspection conducted to evaluate the thoroughness of the Contractor's consideration of their readiness for full Construction Authorization, and previous assessments of Contractor readiness to perform ITS activities, the inspectors developed confidence the pretreatment facility construction activities, authorized by full Construction Authorization, would be accomplished in accordance with authorization basis requirements.

1.3 Adequacy of the Contractor's Design Drawings Issued for Construction (ITP I-135)

1.3.1 Inspection Scope

The inspectors examined several of the Contractor's pretreatment facility design drawings issued for construction, including the basis for the design specified by applicable calculations and DIM, to determine whether the calculations and DIMs conformed to procedurally established requirements and whether the drawings had been reviewed, approved, and issued for construction as required by the Contractor's Quality Assurance Manual (QAM).

1.3.2 Observations and Assessments

The inspectors examined seven design drawings, the associated Design Input Memorandums, and the calculations supporting the designs. The design drawings examined, and the associated DIMs and calculations are identified in Section 3.4 of this report. The supporting DIMs and calculations immediately follow the identified drawing.

The inspectors concluded the following:

- The revision number of the drawing and the DIM were the same, conforming to Design Input procedure requirements.

- All of the reviewed calculations had been administratively assigned Committed Preliminary status, as committed by the Contractor in their response[21] to Inspection Report IR-02-015,[22] Finding IR-02-015-03-FIN.

- Several calculations had unverified assumptions contained within the body of the calculation, or within the section titled Engineering Bases. None of the calculations examined fully conformed, in one manner or another, to the administrative requirements of the Engineering Calculations procedure. The inspectors understood these discrepancies must be corrected as committed by the Contractor in their response[23] to Inspection Report IR-02-015, Finding IR-02-015-03-FIN.[24]

- The inspectors identified procedure conformance problems with the safety screening evaluation conducted by the Contractor on two, of the seven, design DIMs. The Contractor pointed out the inspectors concerns had been identified previously and documented in CAR 24590-WTP-CAR-QA-03-012, *AB Compliance Review of Changes to Drawings*, dated January 16, 2003. The CAR conditions had not been corrected and the CAR remained open.

The inspectors reviewed fifteen drawings from the Pretreatment Facility for proper incorporation of design changes (Field Change Requests [FCR], Field Change Notices [FCN], Design Change Notices [DCN], SDDRs, Nonconformance Reports [NCR]) in accordance with procedure 24590-WTP-3DP-G04B-00046, *Engineering Drawings,* Revision 4, dated February 2, 2003. The inspectors verified the design changes were being incorporated into the next revision and the new revision indicated the previous design changes. The inspectors concluded the Contractor had properly controlled and documented design changes.

Accordingly, the inspectors did not identify any new problems, which had not previously been identified by the Contractor or ORP.

1.3.3 Conclusions

The inspectors concluded, based upon a review of seven design drawings, and their associated DIM and calculations, problems remained regarding calculation conformance with procedure requirements and the completion of acceptable Authorization Basis conformance screening of designs. The inspectors found the problems had previously been identified by either the Contractor or ORP and corrective actions were in progress. No new problems were identified.

[21] BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Supplemental Responses to Inspection Report IR-02-015 and Request for Second Extension on Transmittal of Supplemental Responses to IR-02-012," CCN-048873, dated February 18, 2003.
[22] ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Inspection Report IR-02-015 – Design Process Inspection," 02-OSR-0530, dated November 21, 2002.
[23] Ibid 20.
[24] Ibid 21.

1.4 Adequacy of Calculation Improvement Corrective Actions (IAP A-106)

1.4.1 Inspection Scope

The Contractor's February 26, 2003, letter[25] provided, as an attached Quality Action List, several actions taken to improve engineering performance.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of calculations. The inspectors interviewed Contractor QA and Engineering personnel, examined documentation, and reviewed QA and Engineering procedures to verify Contractor implementation of the checklist items.

1.4.2 Observations and Assessments

The Contractor reviewed a sample of calculations for unverified assumptions (Quality Action List [QAL] item C-1). ORP verified completion of this item and documented the inspection activities in Inspection Report A-03-OSR-RPPWTP-002, Section 1.3.2.a.[26]

The Contractor converted previously Confirmed calculations to Committed Preliminary status (QAL item C-2, C-2a, and C-2b). ORP verified completion of these items and documented the inspection activities in Inspection Report A-03-OSR-RPPWTP-002, Section 1.3.2.a.[27]

The Contractor determined the need to add and train second checkers for Committed Preliminary and Confirmed calculations issued after October 8, 2002 (QAL item C-3). The inspectors examined training content documentation, training attendance sheets, and verified the Contractor was tracking those who had completed the training and those who had not completed training. The Contractor had established a process to assure all who required training would complete the training. The inspectors found almost all of those requiring training had been trained, with only a few remaining. The training was provided to all personnel whose Training Requirements Matrix contained the requirement to read and understand the requirements of the Engineering Calculations procedure. The training was informal training and not entered in the trainee's formal training records, although the Engineering Training organization maintained a database identifying all who required and received the training. The inspectors found the above quality action completed.

The Contractor determined the need to issue a revision to the procedure for Engineering Calculations (QAL item C-4). The inspectors examined the Engineering Calculation procedure and discussed the content with engineering personnel. The inspectors verified the Contractor had issued the revision, as required. The revision provided clarification regarding the expectations of calculation preparers, checkers and approvers; provided provisions for converting all calculations generated before October 8, 2002, to Committed Preliminary status, and clarified the methodology for documenting and tracking to closure any assumptions requiring verification. This issue was the topic of a Finding (IR-02-015-03-FIN) issued in Inspection Report IR-02-015

[25] Ibid 15.
[26] Ibid 8.
[27] Ibid 8.

and addressed in the Contractor's letter dated February 18, 2003.[28] The latest revision of the Engineering Calculation procedure became effective February 13, 2003. The inspectors determined the engineering design disciplines were in the early phase of implementing the log to track the status of conversion of calculations from Committed to Confirmed status, and had not completed listing each calculation assumption requiring verification, the closure method, or the schedule for closure of each assumption.

The Contractor determined the need to have the engineering Process Assurance organization conduct monthly surveillances of calculations to assess conformance with calculation procedure requirements (QAL item C-5). The inspectors examined the results of the October, November, and December 2002 surveillances and the results of the January 2003 surveillance. The findings of those examinations and the conclusions are discussed below.

- Calculations-October Review: This surveillance examined eight calculations, performed during October 2002, after completion of the second checker review. Five of the eight had Engineering Calculations procedure conformance discrepancies, a 63% failure rate. The Contractor took no action to increase the sample size to determine the magnitude and degree of calculation nonconformance. The discrepancies were documented by CAR 24590-WTP-CAR-QA-03-001, written January 6, 2003; about 52 days after the surveillance report had been issued. In addition, the event date documented on the CAR was January 6, 2003 instead of the proper event date of November 15, 2002, the date the surveillance report was issued. Accordingly, the corrective actions documented by the CAR failed to address the need to improve timeliness of problem identification.

- Engineering Calculations-November Review: This review examined three calculations, performed during November 2002, which had completed checking by the second checker. Two of the reviewed calculations did not conform to administrative requirements established by the procedure for Engineering Calculations, a 66% failure rate. The Contractor did not take any action to increase the sample size and did not document the surveillance findings using the established processes for effecting corrective action by documenting the deficiencies using a CAR.

- Engineering Calculations, December Review: The Contractor determined 53 calculations had been completed during December 2002. The surveillance examined five of the 53 completed. The Contractor found four of the five examined demonstrated instances of nonconformance with administrative requirements of the procedure for Engineering Calculations, an 80% failure rate. The Contractor did not take any action to increase the sample size and did not document the surveillance findings using the established processes for effecting corrective action by documenting the deficiencies using a CAR.

- Surveillance 24590-WTP-SV-PA-03-002, *Calculations, January 2003*: The Contractor determined 56 calculations had been completed during January 2003. The contractor examined six of the 56 completed calculations. The Contractor found four of the six examined demonstrated instances of nonconformance with administrative requirements of the procedure for Engineering Calculations, a 66% failure rate. The Contractor did not take any action to increase the sample size and did not document the surveillance findings

[28] Ibid 21.

using the established processes for effecting corrective action by documenting the deficiencies using a CAR.

Procedure 24590-WTP-GPP-QA-601, *Quality Assurance Surveillance*, Revision 1, dated August 22, 2002, required in Section 3.5.3, "Document any identified conditions adverse to quality (deficiencies) on a Corrective Action Report in accordance with 24590-WTP-GPP-QA-201, "Corrective Action" or a Nonconformance Report in accordance with 24590-WTP-GPP-CON-7104, "Nonconformance Reporting and Control." The Corrective Action procedure, Section 2.0, prescribed "Deficiencies identified during audits, surveillances, or assessments shall be documented using a Corrective Action Report and tracked through closure." The inspectors found the Contractor failed to document the identified conditions adverse to quality, found during surveillances, using either a CAR or nonconformance report. This is an example of a Finding (A-03-OSR-RPPWTP-011-01-FIN).

Following the identification of this situation by the inspectors, on March 5, 2003, the Contractor wrote CAR 24590-WTP-CAR-QA-03-060, *Administrative Deficiencies in Calculations*, documenting the failure to document the findings of the December 2002 and January 2003 surveillances using established corrective action processes specified by procedure.

The Contractor had completed the February 2003 surveillance and was documenting the results during this inspection. The Contractor planned to continue performing monthly surveillances of calculation performance.

The Contractor committed to provide an attribute checklist for Quality Metric data to disciplines for use by Checkers of calculations (QAL item C-6). The inspectors found the Contractor had devised and implemented a Checklist, to be used by the first and second checkers of calculations. The inspectors compared the Checklist attributes to the requirements of the procedure for Engineering Calculations and concluded the Checklist was a comprehensive listing of the procedure requirements regarding calculation content and thoroughness. The inspectors found the QAL item C-6 was completed.

The Contractor committed to complete classroom training in revised calculation procedure requirements for calculation originators and checkers and provide makeup training (QAL item C-7 and C-7a). The inspectors discussed this committed training with representatives of the Contractor’s engineering training department, examined training attendance lists, and evidence of makeup training. The inspectors found the total population of engineers requiring the training was extracted from the training department Training Requirements Matrix. All personnel whose training requirements included the requirement to read and understand the procedure for Engineering Calculations were required to attend the training. The inspectors examined the instructor’s training content, the training attendance logs, the engineering training departments records of those completing the training, and the records of which staff remained to be trained. The inspectors concluded the training had been completed as committed. The inspectors verified the training had, also, been documented in the training history portion of the selected trainee’s training profile. The inspectors concluded the QAL items C-7 and C-7a had been completed.

The Contractor committed to implement metrics regarding calculation quality by the analysis of data obtained from the first and second checkers use of the calculation checklist (QAL item C-8). The inspectors examined the results of the Contractor’s analysis of the data generated through

the execution of the first and second calculation checkers use of the checklist during the calculation checking performance. The Contractor's data demonstrated, the calculations were of high technical quality because of the small number of instances identified where the calculation results were in error and the fact that none of the calculations checked demonstrated errors which required changing the design. The Contractor's data conclusively demonstrated the errors were primarily failure to conform to the administrative requirements of the Engineering Calculations procedure. The inspectors examined the Contractor's analysis of trends in calculation performance. The Contractor analyzed the results of checking calculations performed in November and December 2002, January 2003, and February 2003. The results of the analysis indicated many of the error types were decreasing; however, several of the error types remained nearly the same and demonstrated no statistically significant trend. The Contractor was continuing to work with all disciplines to improve performance in conforming with procedure requirements.

The Mechanical Systems design organization, at the current phase of design, had the greatest workload and the greatest opportunity for improvement, at the time of inspection. Other disciplines could be expected to have workload spikes in the future. The Mechanical Systems metric analysis staff was providing training to other disciplines regarding lessons learned, corrective actions and recommendations to avoid the types of problems experienced by Mechanical Systems in the performance of calculations.

The Mechanical Systems metrics staff had extensively analyzed the results of the calculation checklists and concluded the average number of problems per calculation was roughly constant and, recently, first checkers had begun to find more problems than second checkers. Thus, it could be concluded the quality of first checking was improving. The Mechanical Systems analysis determined those staff who performed well in originating and checking calculations and identified those who required additional training or reassignment. The Mechanical Systems group was preparing a Calculation Preparation Desk Instruction to establish a detailed and uniform understanding of performance expectations by clarifying for engineers the Engineering Calculations procedure attribute performance expectations and provide clear acceptance criteria. The inspectors considered this effort a worthy initiative.

The inspectors concluded there was no clear trend indicating continuing improvement in the performance and checking of calculations; however, the Contractor was taking measures to accomplish and sustain improvement. The inspectors found the QAL item C-8, regarding the establishment and implementation of calculation metrics, was complete.

The Contractor committed to issue the root cause report that analyzed engineering performance issues (QAL item C-9). The inspectors examined the root cause analysis report (24590-WTP-RPT-G-02-002, *Root Cause Analysis for Deficiencies Identified in Calculations*, dated October 28, 2002) and found the report had been issued as committed. The root cause analysis recommendations had been identified as corrective measures for CAR 24590-WTP-CAR-QA-02-119.

The root cause analysis identified four root causes for the observed deficiencies. These are discussed below, along with the recommendations for correction (QAL item C-14).

- Supervisors and managers placed much emphasis on meeting schedule and little emphasis on calculation content and procedure compliance. The recommendations were: (1) establish metrics to document performance and procedural compliance; (2) hold individuals accountable for performance; and (3) reward good performance. The inspectors found (1) the metrics and a process of analysis had been established and was being implemented; (2) measures had been implemented to hold individuals accountable for performance; and (3) measures had been implemented to reward good performance.

- The combined level of supervision, training, and procedural content was insufficient to consistently produce quality calculations. The recommendations were to (1) provide training and (2) revise the procedure to be clear regarding the requirements. The inspectors found these recommendations had been implemented.

- There was inadequate analysis of the needs for software documentation in calculations. The recommendation was to determine exact and succinct requirements for software used in calculations and revise the procedure. The inspectors determined the Engineering Calculations procedure, Section 3.3, had been revised to provide better definition of software requirements.

- Management underestimated the difficulty of tracking uses of calculation results in the project electronic documentation environment. The recommendations were (1) develop and implement a single, coherent, project-wide method to ensure owners of affected documents were notified in a timely manner when calculation results changed (this was accomplished in the revised Engineering Calculations procedure, Section 3.8) and (2) identify and assign a discipline manager owning the calculation and the responsibilities of the discipline manager (this was accomplished in the revised Engineering Calculations procedure, Section 3.8).

The Contractor documented the results and recommendations from the root cause analysis for calculation deficiencies and correlated these to corrective actions. The Contractor, also, determined the contributing causes and the lessons learned. The Contractor documented the analysis results and associated corrective actions in *Corrective Action Report 24590-WTP-CAR-QA-02-119*, dated November 4, 2002. The inspectors examined the corrective actions identified and verified the completion of the specified actions by engineering. The CAR remained open pending completion of verification of corrective action completion by engineering and QA. Accordingly, the inspectors concluded the commitments of QAL items C-9 and C-14 had been accomplished. (Additional discussions on the above root cause analysis can be found in Inspection Report A-03-OSR-RPPWTP-002, Section 1.3.2.a, "Recovery Actions,"[29] to address calculation concerns.

The Contractor committed to identify discipline chief engineer's calculation specialists (QAL item C-10 and C-13). The inspectors verified discipline chief engineer's calculation specialists had been identified and trained. The roles and responsibilities had been defined and included in the training (QAL item C-13). The training was informal and not contained in the individual's training profile. The training had been tracked and completion assured by the engineering

[29] Ibid 8.

training organization. The inspectors concluded the commitment of QAL item C-10 and C-13 had been accomplished.

The Contractor committed to develop a first draft of the metrics (QAL item C-11). The inspectors verified the completion of this commitment. Additional discussion of metrics and their uses has been provided, above, in QAL item C-8. This commitment is completed.

The Contractor committed to develop an initial schedule for converting committed calculations to confirmed status (QAL item C-12). The inspector found all previously confirmed (completed) calculations had been converted to committed status. The inspectors examined schedules for converting the committed calculations to confirmed status. Most of the schedules identify dates of 2005 through 2007 without identifying the month or actions needed to accomplish the conversion. The Contractor was in process of refining the schedules to be more realistic. This commitment is completed.

The Contractor committed to perform a November 2002 review of the calculation checklist effectiveness (QAL item C-15). The inspectors examined the results and documentation of the November 2002 review and concluded the review had been accomplished as stated. The November 2002 review has been discussed in greater detail in the discussion closing QAL item C-5, above. Accordingly, QAL item C-15 is completed.

Another action committed by the Contractor required responding to CAR 24590-WTP-CAR-QA-02-119 regarding a broad range of deficiencies in the performance of engineering work (QAL item C-16). The inspectors examined the latest response and corrective action assignments to CAR 02-119 and found the CAR remained open pending completion of corrective action implementation. The inspectors concluded the Contractor had responded to the issues identified and QAL item C-16 was completed. Additional inspections of CAR 02-119 corrective actions have been documented above in the paragraphs documenting the closure of QAL items C-9 and C-14.

The Contractor committed to conduct reviews of calculations performed in October 2002 (QAL item C-17). The inspectors examined the results of the review. The inspector's conclusions regarding calculation review by engineering process assurance have been discussed above in the closure of QAL item C-5. QAL item C-17 is completed.

The Contractor committed to develop and implement a method to ensure owners of effected documents were notified in a timely manner when results of calculations used as inputs have changes (QAL item C-18), issue a management directive for implementing the methodology (QAL item C-18a), and revise the Engineering Calculation procedure to include the methodology (QAL item 18c). Item 18b was deleted fro the QAL. The inspectors examined documentation demonstrating the committed actions had been completed. The inspectors verified the methodology had been included in Revision 3 of the Engineering Calculations procedure, Section 3.8. The inspectors verified the Contractor had conducted training regarding the methodology for the engineering staff. QAL item C-18, 18a and 18c is completed.

The Contractor committed to review the calculations performed in November 2002 (QAL item C-19). This was a duplicate entry and accomplished by QAL item C-5. The inspectors verified

the November 2002 calculation review had been completed. The findings and conclusions have been discussed in the paragraphs closing QAL item C-5, above.

1.4.3 Conclusions

The inspectors concluded the Contractor had completed implementing the corrective actions, applicable to calculations, identified by the QAL, Section C. The inspectors found, although improvement initiatives had been instituted, the effectiveness of the initiatives could not be clearly demonstrated. The inspectors found it was early in the implementation phase to establish a clear improving trend in the quality of calculation performance and checking or in the correction of previously identified deficiencies. The inspectors identified one Finding regarding failure to take adequate corrective action as required by procedure (Finding A-03-OSR-RPPWTP-011-01-FIN).

1.5 Adequacy of DIM Corrective Actions (IAP A-106)

1.5.1 Inspection Scope

The Contractor's February 26, 2003, letter[30] provided, as an attached Quality Action List, several actions taken to improve engineering performance.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of DIM accuracy and completeness. The inspectors interviewed Contractor QA and Engineering personnel, examined documentation, and reviewed QA and Engineering procedures to verify Contractor implementation of the checklist items.

1.5.2 Observations and Assessments

The Contractor committed to conduct a sample review of DIMs for accuracy and completeness (QAL item D-1) and issue design criteria guidance for minimum DIM content and use by engineering staff (QAL item D-2). The inspectors examined documentation of completion. The inspectors found each project discipline had reviewed 10% of their issued DIMs to assess their accuracy and completeness. Generally, the reviews identified problems in the areas of design input identification (missing and unused design inputs) and invalid or incorrect references. The review results were documented by Meeting Minutes, dated November 4, 2002, and Meeting Minutes, dated November 7, 2002. Improvement initiatives were taken by the Contractor and verified by the inspectors. The inspectors verified the Contractor issued a revision of the Design Criteria procedure and established of a design guide (24590-WTP-GPG-ENG-038, *Design Guide: Design Input Memorandum*, Revision 0, dated November 22, 2002) to clarify expectations and acceptance criteria. The inspectors found QAL items D-1 and D-2 were completed as specified.

[30] Ibid 15.

The Contractor committed to complete DIM classroom training for drawing DIM originators and checkers (QAL item D-3). The inspectors verified the Contractor had provided training for DIM originators and checkers. The inspectors examined documentation specifying training content and concluded the content addressed the requirements of the *Design Guide: Design Input Memorandum* procedure. The Contractor committed to provide training for the staff on DIMs (QAL item D-4). The inspectors examined documentation of training attendance and concluded the Contractor documented the attendance on databases maintained by the Engineering Training organization and conducted make-up training for those staff not attending the previous training. The inspectors found the training was informal training and, therefore, not documented in the employee's training requirements matrix or training completion records, maintained by the Contractor's training organization. The inspectors concluded QAL items D-3 and D-4 had been completed.

The Contractor committed to distribute the DIM checklist to DIM engineers (QAL item D-5). The inspectors verified the DIM checklist had been distributed to DIM originators by an electronic mail on February 7, 2003, and to all WTP DIM checklist users notifying them of the location and address of the checklist in the computer shared drive. This item is completed.

1.5.3 Conclusions

The inspectors concluded the Contractor had completed the corrective actions applicable to DIM improvement. However, based upon the inspector's conclusions developed during the inspections of Pretreatment design documents, documented in Section 1.3 of this report, the inspectors concluded the effectiveness of the Contractors corrective actions had not been conclusively demonstrated because problems were still evident in DIM execution.

1.6 Adequacy of Supplier Deviation Disposition Request (SDDR) Improvement Corrective Actions (IAP A-106)

1.6.1 Inspection Scope

The Contractor's February 26, 2003, letter[31] provided, as an attached Quality Action List, several actions taken to improve engineering performance.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of SDDRs. The inspectors interviewed Contractor QA and Engineering personnel, examined documentation, and reviewed QA and Engineering procedures to verify Contractor implementation of the checklist items.

1.6.2 Observations and Assessments

The Contractor committed to perform evaluations of SDDRs by disciplines and identify corrective actions (QAL item S-1). The inspectors reviewed the SDDR matrix, which included

[31] Ibid 15.

100 percent of all SDDRs as of November 2002. The matrix identified the appropriate change documents needing to be immediately incorporated into the design. There was, also, a population of SDDRs designated as Incorporate By Reference (IBR) planned to be incorporated during the next revision of the specification or drawing. The inspectors concluded that the Contractor performed the committed evaluations and complete the specified corrective actions. The Contractor committed to conduct Quality Improvement meetings discussing SDDR's on a monthly basis as informal training (QAL item S-2). The inspectors reviewed informal training records for months November 2002, December 2002, January 2003, and February 2003. The inspectors concluded the training was performed.

The Contractor committed to hold a meeting with Configuration Management (CM) engineering management to discuss the results of the evaluation of the SDDR review (QAL item S-3). There were no meeting notes or letters documenting the discussion or results of this meeting. The inspectors interviewed some personnel that attended the meeting and learned the Contractor did discuss the results of the SDDR evaluation. The inspectors concluded the committed meeting was held to discuss the results of the SDDR evaluation.

The Contractor committed to include on the agenda for the November 2002 Quality Improvement meeting the topics of CAR status, calculation quality, AB maintenance, and Process Assurance Feedback (QAL item S-4). The inspectors reviewed the November 2002 and December 2002 meeting agendas and verified they included the above areas. The inspectors concluded that the committed topics had been discussed.

The Contractor committed to revise the SDDR procedure and the SDDR form in response to CAR 02-149 and BNI's letter dated October 30, 2002.[32] (QAL item S-5) The inspectors reviewed the revised SDDR procedure 24590-WTP-3DP-G04B-00063, *Supplier Deviation Disposition Request,* Revision 2, dated November 22, 2002, and the revised form 24590-ENG-F00001, Revision 2, for conformance with commitments. The inspectors concluded that the revisions completed the commitments in this area.

The Contractor committed to provide a "good" SDDR example on the new form (QAL item S-6). The inspectors reviewed the "good" example, which was presented at the monthly Quality Improvement meetings, and found it to be in conformance with the new SDDR procedure. The inspectors concluded that the Contractor provided a "good" SDDR example to the engineering group.

1.6.3 Conclusions

The Contractor had completed implementing the actions to improve the SDDR process execution in accordance with specified commitments. However, it was early in the implementation phase to demonstrate clear improvement in the SDDR process.

[32] Ibid 12.

1.7. Adequacy of Configuration Management Improvement Corrective Actions (IAP A-106)

1.7.1 Inspection Scope

The Contractor's February 26, 2003, letter[33] provided, as an attached Quality Action List, several actions taken to improve engineering performance.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of configuration management. The inspectors interviewed Contractor QA and Engineering personnel, examined documentation, and reviewed QA and Engineering procedures to verify Contractor implementation of the checklist items.

1.7.2 Observations and Assessments

The Contractor committed to perform CM oversight of Acquisition Services and issue a summary and detailed report to the Engineering Manager of the results (QAL items CM-1, 1a, and 1b). The inspectors reviewed the draft report, issued on October 18, 2002; the summary report dated November 25, 2002; and the detailed report dated November 25, 2002. The reports provided recommendations to the Engineering Manager regarding better ways to improve control of CM activities. The inspectors concluded the CM group performed the oversight of the Acquisition Services group in accordance with the commitments of the Contractor's October 30, 2002, letter.[34]

The Contractor committed to issue the Six Sigma CM Process Review Report, dated October 18, 2002 (QAL item CM-2). The inspectors verified the above report had been issued and entered into the Quality Action List. The inspectors concluded the Contractor had completed the commitment.

The Contractor committed to obtain services of a Configuration Management consultant (QAL item CM-3). The inspectors reviewed a statement of work issued to the configuration management consultant and minutes of the meeting this individual attended. The inspectors concluded the contractor had obtained the services of a configuration management consultant.

The Contractor committed Project Document Control (PDC) personnel and QC inspectors to perform an audit of the site libraries to assess the accuracy of the drawing and specification revisions and change documents to compare the current ALTRIS listing (QAL item CM-4). The inspectors reviewed the QC reports dated October 1, 2002, October 2, 2002, and October 10, 2002. The October 1, 2002, report identified numerous errors in the different libraries. The October 2, 2002, and October 10, 2002, report identified the drawing, specifications, and design changes in all the field libraries accurately reflected the current ALTRIS listing. The inspectors concluded that the contractor performed the committed audits.

[33] Ibid 15.
[34] Ibid 12.

The Contractor committed to initiate a program for data entry into PDC and perform integrity monitoring of the process (QAL item CM-5 & 5a). The inspectors reviewed procedure 24590-WTP-GPP-PADC-008, *Internal PADC Data Entry Monitoring Process,* Revision 0, dated December 16, 2002. The inspectors reviewed monthly summary reports of PADC record and process monitoring, 24590-WTP-RPT-PADC-02-011, Revision 0, dated November 6, 2002, and 24590-WTP-RPT-PADC-02-012, Revision 0, dated December 17, 2002. The inspectors concluded that the Contractor had initiated a program for data entry into PDC and had a monitoring program for that process.

The Contractor committed to perform weekly surveillances of the field technical controlled libraries for accuracy of drawings, specifications, and change documents to Control Records and Documents (CONRAD) (QAL item CM-6). CONRAD was a new computer program, replacing ALTRIS on January 1, 2003. This activity had been verified in the closing of Finding IR-02-014-02-FIN.

The Contractor committed to review all electrical FCR's and any changes that were incorporated into drawings (QAL item CM-7). The review was completed October 15, 2002 for electrical FCR's, in accordance with CAR 02-137. Design Change Notice (DCN) 24590-BOF-DCN-E-02-003 was issued to take immediate action to resolve problem in the field. The Contractor did not find any other deficiencies in the electrical area. CAR 02-137 required the Contractor to review 25% of the Civil, Structural, and Architectural FCRs. The inspectors concluded the Contractor had reviewed all the electrical FCR's in accordance with CAR 02-137.

The Contractor committed to perform a review of CM related CARs and issue a memorandum documenting the review (QAL items CM-8 & 8a). The inspectors reviewed a matrix the CM group had complied of open CM related CARs, dated November 6, 2002. The CAR matrix was being updated during this inspection. The inspectors reviewed an electronic mail from the CM manager to the Engineering Process, Procedures, and Personnel Manager, dated February 7, 2003, with the results of the matrix. The inspectors concluded that the matrix had been established and the results of the first matrix were issued to management. The inspectors noted the CM group was not keeping the matrix up to date.

The Contractor committed to review lessons from earlier PDC attention to detail solutions (QAL item CM-9). The inspectors reviewed an electronic mail from the Engineering Process, Procedures, and Personnel Manager to the PDC Manager, dated November 1, 2002, concerning review of lessons from earlier PDC attention to detail solutions. The inspectors concluded that a review was performed from earlier PDC attention to detail solutions and the information shared with the appropriate managers.

The Contractor committed to create a PDC procedure for document data entry (QAL item CM-10). The inspectors reviewed the new procedure 24590-WTP-GPP-PADC-008, *Internal PADC Data Entry Monitoring Process,* Revision 0, dated December 16, 2002. The procedure gave clear direction and management expectations for personnel entering data into CONRAD. The inspectors concluded the Contractor had issued a new procedure for document data entry.

The Contractor committed to sample 25% of the FCR's in the civil, structural, and architectural areas for proper incorporation into the design (QAL item CM-11). The inspectors reviewed the matrix of 30 FCRs, representing the 25% of Civil Structural and Architectural FCR's. The

inspectors reviewed electronic mail from the CM Supervisor to the Engineering Process, Procedure, and Personnel Manager, dated November 26, 2002, documenting the results of this review. The electronic mail documented there was one FCR identified which had not been incorporated into the next (already completed) revision of the applicable drawing, and three FCRs which had not been referenced in the revision block of the new drawing revision, contrary to the requirements of procedure 24590-WTP-3DP-G04B-00046, *Engineering Drawings,* Revision 4, dated February 7, 2003. The procedure, Paragraph 3.5.4, required "All outstanding design change control documents (DCNs, Field Change Requests, Field Change Notices) and other design changes approved for incorporation (SDDRs, NCRs) shall be incorporated into the associated drawing, by drawing revision, anytime one of the following occurs: The drawing is revised and reissued for any reason; application to multi-sheet drawings require incorporation of only those change documents affecting the particular sheets being issued," and "In the revision block, the revision description shall identify (by document number) all design change control documents and other approved design changes incorporated." The Contractor had identified these discrepancies on November 26, 2002, as documented in the electronic mail. The Contractor failed to document these discrepancies in accordance with their procedure for Corrective Action, Section 2.0, which required "Deficiencies identified during audits, surveillances, or assessments shall be documented using a Corrective Action Report and tracked through closure." The inspectors found the Contractor failed to document the identified conditions adverse to quality, found during surveillance, using either a CAR or nonconformance report. This is an example of a Finding (A-03-OSR-RPPWTP-011-FIN). The inspectors concluded that the Contractor completed the 100% FCR review as committed.

The Contractor committed the CM group to review and report on samples of CM enabling change control documents on a monthly basis (QAL items CM-12, 12a, and 12b). The inspectors reviewed Design Change Control Document Review memorandums for November 2002, December 2002, and January 2003. There were numerous discrepancies identified in the three memorandums. All the discrepancies were entered into Recommendation and Issue Tracking System (RITS) and appropriate CARs where issued. The inspectors concluded that the Contractor was performing monthly surveillances on CCD activities and identifying problems.

The Contractor committed to institute performance metrics feedback for CARs, FCRs, DCNs, NCRs, SDDRs, and Management Assessments, as recommended in an internal Memorandum dated October 18, 2002 (QAL item CM-13). The memorandum identified 10 metrics:

- CARs – Ratio of number identified by function (self identified) versus number identified by others
- CARs – Number of new CARs, number of closed CARs, and number of open CARs
- CARs – Average closure time
- FCRs – Ratio of number of FCRs versus number of one time deviations
- FCRs/DCNs – Time from 5 total changes against a drawing to drawing revision
- FCRs/DCNs – Time from 3 total changes against a specification to specification revision
- NCRs – Timeliness of implementation of disposition into drawing/specification
- SDDRs – Timeliness of implementation of disposition into drawing/specification
- Management Assessments – Timeliness of addressing recommendations
- Management Assessments – Categorizing of recommendations

The inspectors reviewed the existing Quality Assurance Information System (QAIS) database and reports from PDC to verify that the Contractor was performing the above recommendations. The inspectors concluded the Contractor had the ten metrics in place and was collecting data for trending.

The Contractor committed to revise the FCR procedure and FCR form for better engineering technical disposition of FCRs and change control (QAL item CM-14). The inspectors reviewed the revised FCR procedure 24590-WTP-3DP-G04B-00062, *Disposition of Field Change Request/Field Change Notice,* Revision 4, dated February 7, 2003. The Contractor revised the FCR form in this revision with instructions on how to complete the FCR form correctly. The inspectors concluded that the Contractor had adequately revised the FCR procedure and FCR form as committed to enhance the technical justifications and FCR processing.

The Contractor committed to establish checklists for DIMs, SDDRs, NCRs, and FCRs to help guide the engineers when working with these documents (QAL item CM-15). The inspectors reviewed a memorandum dated November 27, 2002, from the System Engineering Manager to the Engineering Discipline Leads, instructing the engineers to use the checklist when filling out or providing dispositions to the above documents. In the instructions of the memorandum, the Process Engineering, Procedures, and Personnel Manager wanted feedback from the Discipline Leads to verify the checklists were enhancing the process when working with the above documents. The Process Engineering, Procedures, and Personnel Manager was aware of this issue and evaluating the need for feedback. The inspectors concluded the Contractor had established checklists for the engineers when working with the above documents; however, there had been no feedback as of this inspection.

The Contractor committed to perform Safety and Quality training sessions for PDC personnel on a monthly basis (QAL item CM-16). The inspectors reviewed informal training records from the months of November 2002, December 2002, January 2003, February 2003, and the training agendas for each month. The inspectors concluded the PDC personnel had received adequate training for Safety and Quality improvement requirements on a monthly basis.

The Contractor committed to establish links in ALTRIS for FCRs and their affected documents, were identified during the FCR reviews (QAL item CM-17). The inspectors reviewed electronic mail from the PDC Manager to the Engineering Process Assurance Supervisor, dated January 27, 2003, listing all the affected FCRs and their affected documents, and declaring that all the missing links were established in CONRAD. The inspectors concluded the Contractor had established the missing links in CONRAD for the affected FCRs and affected documents.

The Contractor committed to perform bimonthly Surveillance/Management Assessments by area disciplines for engineering processes (FCR, DCN, NCR, SDDR, etc.) (QAL items CM-18, 18a, and 18b). The inspectors reviewed the first management assessment report 24590-WTP-MAR-ENG-02-010, dated December 12, 2002. The assessment covered the above areas and identified issues and recommendations to management. The February report had not been issued as of this inspection, although the assessment had been performed and the information was being documented. The inspectors concluded the Contractor was performing bimonthly management assessments with good results and recommendations for improvement.

The Contractor committed to have PDC participate in the Six Sigma process improvement initiative and definition of PDC related CM enabling quality metrics (e.g. number of CONRAD data entry and status accounting data entry errors, number of mis-filed documents in controlled stick files, etc.) for short term and long-term monitoring and process improvement feedback and control (QAL item CM-19). The inspectors reviewed a desktop instruction 24590-WTP-GPG-PADC-002, *Data Entry and Process Monitoring,* Revision 0, dated January 7, 2003. The desktop instruction gave direction on what attributes to review and how to document the issues. The inspectors concluded the desktop procedure adequately addressed all the committed issues and document the results from monitoring performed on a monthly basis.

The Contractor committed to perform a monthly assessment of PDC data entries and provide feedback (QAL item CM-20). The inspectors reviewed the monthly feedbacks, starting in November, 24590-WTP-RPT-PADC-02-011, Revision 0, dated November 6, 2002; 24590-WTP-RPT-PADC-02-012, Revision 0, dated December 17, 2002; and 24590-WTP-RPT-PADC-03-001, Revision 0, dated February 5, 2003. There were issues identified in the reports and the Contractor documented these in CAR 02-283. The inspectors concluded the scope of the assessment and issues found were adequately identified by the Contractor during the monthly assessments on PDC for data entry.

The Contractor committed to perform bimonthly PDC management assessments, coordinated with engineering disciplines, of drawing, design input, and change control documentation processes through May 2003 (QAL item CM-21). The inspectors reviewed the first management assessment report 24590-WTP-MAR-PADC-02-009, Revision 0, dated December 3, 2003. The February report had not been issued as of this inspection. The inspectors concluded the bimonthly assessment the Contractor had performed was adequately coordinated between the engineering disciplines for input into the assessment as committed.

The Contractor committed to revise six procedures (Drawings, Specifications, FCR/FCNs, SDDRs, NCRs, and MRs) by November 5, 2002 (QAL item CM-22). The inspectors reviewed the six revised procedures: 24590-WTP-3DP-G04B-00046, *Engineering Drawings,* Revision 3, dated November 22, 2002; 24590-WTP-3DP-G04B-00049, *Engineering Specifications,* Revision 3, dated November 27, 2002; 24590-WTP-3DP-G04B-00061, *NCRs,* Revision 2, dated November 27, 2002; 24590-WTP-3DP-G04B-00062, *FCRs/FCNs,* Revision 3, dated November 27, 2002; 24590-WTP-3DP-G04B-00063, *SDDRs,* Revision 2, dated November 22, 2002; and 24590-WTP-3DP-G06B-00001, *Material Requisitions,* Revision 3, dated November 27, 2002. The inspectors concluded the revisions made by the Contractor enhanced control and provided clearer instructions for the design changes process.

The Contractor committed to review all FCRs, FCNs, SDDRs, and NCRs for adequacy of the decision to incorporate by reference (IBR) change documents into the design by the end of November (QAL item CM-23). The inspectors reviewed a document dated November 19, 2002, with a list of FCRs/FCNs/NCRs that were concluded to be IBR documents. The SDDRs were being reviewed for this condition under CAR 02-144. The inspectors reviewed five design change documents from the document list above and identified one FCR that was questionable whether it met the criteria for IBR. This FCR was brought to the attention of the Contractor for further investigation. The inspectors concluded the Contractor performed the required reviews and the IBR decisions were appropriate.

The Contractor committed to develop a plan for incorporating or resolving the specific recommendations of an internal memorandum dated October 18, 2002, by January 2003 (QAL items CM-24 & 24a). The Contractor added the six CM recommendations resulting from the Six Sigma evaluation to the Quality Action List. The inspectors concluded the Contractor had resolved or incorporated the recommendations of the memorandum.

The Contractor committed to perform a comprehensive review of all CARs in Engineering dealing with configuration management issues. The review would reassess the identified corrective actions, confirm the extent of condition, and reconfirm appropriate closures of the CARs (QAL item CM-25). The inspectors reviewed an internal letter dated November 21, 2002, from the Process Assurance supervisor to the Process Engineering, Procedures, and Personnel Manager documenting the review of 46 CM-specific CARs. The Contractor concluded 8 CARs needed to be re-reviewed. These 8 CARS were re-reviewed by the responsible persons to ensure the appropriateness of the corrective action plan and all the necessary actions have been addressed. Seven of the eight CARs needed no further actions. One CAR's extent of conditions was revised to include additional reviews. The inspectors concluded the Contractor had completed a comprehensive review of all outstanding CARs dealing with configuration management as committed.

The Contractor committed to issue a Configuration Management plan that incorporates or explains exceptions taken to The International Organization for Standardization (ISO) 10007:1995(E) (Quality Management Guide Lines for Configuration Management) (QAL items CM-26, 26a, and 26b). The inspectors reviewed a draft of the Configuration Management Plan 24590-WTP-PL-MG-01-002, dated November 27, 2002. The Contractor made a matrix referencing requirements between ISO 10007:1995(E) and the 24590-RPP–WTP-Configuration Management Plan, Revision 0. The inspectors reviewed the gaps identified by the matrix analysis to access the Contractor's disposition and found no discrepancies. The Contractor issued 24590-WTP-PL-MG-01-002, Revision 1, dated December 31, 2002. The inspectors concluded the Contractor fulfilled their commitment by establishing a requirement comparison matrix for ISO 10007:1995(E) and Revision 1 of their Configuration Management Plan.

The Contractor committed to revisit the gap analysis to ORP Inspection Technical Procedure (ITP) I-102 to confirm no additional Engineer, Procure, and Construct (EPC) CM related actions were necessary (QAL item CM-27). The inspectors reviewed electronic mail from the CM Supervisor to the Engineering Process, Procedures, and Personnel Manager dated February 13, 2003, discussing gaps between ITP I-102 and the Configuration Management Gap Analysis. There were numerous differences between the two documents and the Contractor placed the differences in the RITS program to be tracked and assigned to the responsible department. The inspectors concluded the Contractor revisited the gap analysis and identified issues to be resolved.

The Contractor committed to perform a 100% review of FCRs in disciplines other than Civil, Structural, and Architectural and Electrical (QAL item CM-28). The inspectors reviewed an electronic mail dated March 4, 2003 from the Configuration Management Supervisor to the Systems Engineering Manager with results of the FCR review. The electronic mail documented there were seven FCRs identified which had not been incorporated into the next (already completed) revision of the applicable drawing, contrary to the requirements of procedure 24590-WTP-3DP-G04B-00046, *Engineering Drawings,* Revision 4, dated February 7, 2003. The

procedure, Paragraph 3.5.4, required "All outstanding design change control documents (DCNs, Field Change Requests, Field Change Notices) and other design changes approved for incorporation (SDDRs, NCRs) shall be incorporated into the associated drawing, by drawing revision, anytime one of the following occurs: The drawing is revised and reissued for any reason; application to multi-sheet drawings require incorporation of only those change documents affecting the particular sheets being issued," and "In the revision block, the revision description shall identify (by document number) all design change control documents and other approved design changes incorporated." The Contractor had identified these discrepancies on February 10, 2003, according to the electronic mail. The Contractor failed to document these discrepancies in accordance with their procedure for Corrective Action, Section 2.0, which required "Deficiencies identified during audits, surveillances, or assessments shall be documented using a Corrective Action Report and tracked through closure." The inspectors found the Contractor failed to document the identified conditions adverse to quality, found during surveillance, using either a CAR or nonconformance report. This is an additional example of a Finding (A-03-OSR-RPPWTP-011-FIN). The inspectors concluded that the 100% FCR review in other engineering disciplines was completed.

Six Sigma Recommendations

The Contractor listed the Six Sigma evaluation recommendations on the Quality Action List. The Contractor was tracking the recommendations and assigned actions to the appropriate discipline, the individual responsible for the action, and a completion date. The inspectors verified the actions had been completed (CM-1 through CM-28).

1.7.3 Conclusions

The Contractor had implemented the committed corrective action processes, training, and management assessments resulting from their internal performance improvement initiatives in the area of configuration management. The Contractor was self-identifying issues in this area and had demonstrated some improvement. The new processes had only been in place for a few weeks; accordingly, it was too early to conclude the Contractor's corrective actions in the area of configuration management were effective.

The Contractor failed to document discrepancies found during surveillances using their specified processes for corrective action reporting. This is an additional example of a Finding (A-03-OSR-RPPWTP-011-FIN).

1.8 Adequacy of Corrective Actions to Improve Performance in Authorization Basis Conformance (IAP A-106)

1.8.1 Inspection Scope

The Contractor's February 26, 2003, letter[35] provided, as an attached Quality Action List, several actions taken to improve engineering performance.

[35] Ibid 15.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of ensuring Authorization Basis conformance to established requirements. The inspectors interviewed Contractor Engineering personnel, examined documentation and reviewed Engineering procedures to verify Contractor implementation of the Quality Action List.

1.8.2 Observations and Assessments

In their February 25, 2003 readiness letter,[36] the Contractor described ten quality actions to improve their performance in implementing Authorization Basis requirements. The first quality action mandated the use of an AB screening checklist for all primary design documents (QAL item AB-1). This quality action was verified as complete and documented in Inspection Report A-03-OSR-RPPWTP-002, Section 1.3.2e..[37] The second quality action committed to revise the necessary procedure to mandate the use of the AB screening checklist. This action was also verified as complete and documented in the section and Inspection Report described above. The above actions were also evaluated and discussed in Inspection Report A-03-OSR-RPPWTP-007, Section 1.2.[38]

The third quality action involved 100 % review of primary design documents (numeric revisions) for AB compliance (QAL item AB-3). The initial review of primary design documents was initially inspected and documented in section 1.4 of the above AB inspection report. During this inspection the inspectors were provided with a copy of a memorandum, dated March 4, 2003, which modified an earlier memorandum discussed in the AB inspection. The earlier memorandum reported completion of the 100% review of the issued primary drawings. The later memorandum updated this review to include drawings which were inadvertently missed during the initial drawing review period. A total of fifteen drawings were added to the list. The additional drawings did not alter the initial conclusion. No Authorization Basis Change Notices (ABCNs) or Authorization Basis Amendment Requests (ABAR) resulted from these reviews.

The fourth quality action involved modifying the drawing, design criteria and change control procedures to address descriptive text in the PSAR (QAL item AB-4). The inspectors reviewed the following procedures:

- 24590-WTP-3DP-G04B-00046, Revision 4, *Engineering Drawings*, dated February 7, 2003
- 24590-WTP-3DP-G04B-00049, Revision 4, *Engineering Specifications*, dated February 7, 2003
- 24590-WTP-3DP-G04T-00901, Revision 2, *Design Change Control*, dated December 26, 2003

[36] Ibid 15.
[37] Ibid 8.
[38] Ibid 17.

- 24590-WTP-3DP-G04B-0001, Revision 2, *Design Criteria*, dated November 22, 2003.

The inspectors found the guidance provided in the above procedures was consistent with other BNI implementing procedure and with DOE's RL/REG-97-13, *OSR Position on Contractor Initiated Changes to the Authorization Basis*.[39]

The fifth quality action involved training design engineers and AB coordinators (QAL item AB-5). Training of design engineers and AB coordinators was discussed in section 1.7 of the above AB inspection report. The status of this quality action had not changed.

The sixth quality action involved identifying appropriate guidance for change documents relative to AB screening (QAL item AB-6). This quality action was completed by the issuance of a Contractor memorandum dated February 5, 2003, to Engineering Managers. The memorandum was issued by the Manager of Engineering Processes, Procedures and Personnel. It provided AB compliance guidance for DCNs and FCRs affecting Primary Drawings. The guidance amplified requirements already provided in the DCN and FCR implementing procedures.

The seventh quality action was written to modify the screening process based on a proposed revised AB maintenance process (QAL item AB-7). This new AB maintenance process has been place on hold and this corrective action will not be implemented until DOE approves the new AB maintenance process.

The eighth quality action revised procedure 24590-WTP-3DP-G04B-00046, *Engineering Drawings*, effective date February 7, 2003 (QAL item AB-8). The procedure was revised to clarify aspects of confusion listed in the AB root cause analysis (see section 1.5 of the AB inspection report for additional details on the adequacy of the root cause analysis). The revised procedure added Section 3.3, *Authorization Basis Compliance*, which provided additional guidance on the subject of authorization basis. The inspectors found the guidance provided was consistent with other BNI implementing procedure and with RL/REG-97-13.

The ninth quality action involved updating the computer based training module for AB maintenance (QAL item AB-9). The forecast date for completing this item was April 11, 2003. The inspectors were therefore unable to verify completion of this action item.

The tenth quality action involved implementing a method to provide continued guidance to AB coordinators on AB screening issues (QAL item AB-10). The contractor instituted a monthly AB coordinators meeting to discuss issues concerning the AB maintenance process. To date, two meetings have been held by the contractor. The inspectors reviewed the minutes for the January 22, 2003, and the February 26, 2003, meetings. The meetings were well attended (attendance rosters were presented) and the topics discussed related directly to the AB maintenance process.

[39] RL/REG-97-13, *OSR Position on Contractor Initiated Changes to the Authorization Basis,* Rev. 9, 2002.

1.8.3 Conclusions

The inspectors concluded the Contractor had completed implementing the corrective actions, applicable to authorization basis conformance, identified by the Quality Action List, Section AB. The inspectors found, although improvement initiatives had been instituted, the effectiveness of the initiatives could not be clearly demonstrated. The inspectors found it was too early in the implementation phase to establish a clear improving trend in the quality of authorization basis conformance. Additional conclusions reached by ORP inspectors concerning authorization basis conformance can be found in the AB inspection report discussed above. Material reviewed by the inspectors during this inspection had no impact on the conclusion reached during the AB inspection.

1.9 Adequacy of the Contractor's Actions to Manage and Monitor Engineering Performance Corrective Actions (IAP A-106)

1.9.1 Inspection Scope

The Contractor's February 26, 2003, letter[40] provided, as an attached Quality Action List (QAL), several actions taken to improve engineering performance.

The inspectors assessed the status and implementation of actions to improve engineering performance in the area of managing and monitoring engineering performance corrective actions. The inspectors interviewed Contractor Engineering personnel, examined documentation and reviewed Engineering procedures to verify Contractor implementation of the Quality Action List. The actions reviewed by the inspectors were O-1, O-7 and O-8. The other listed actions were not reviewed because they were unverifiable, superseded by other quality actions, or considered Contractor specific management practices that were of no interest to DOE.

1.9.2 Observations and Assessments

The Contractor committed to issue six CARs to disciplines from the Chief Engineer's review of calculation compliance (QAL item O-1). The inspectors verified the Contractor had issued six CARs (24590-WTP-CAR-QA-02-180, 181, 182, 183, 184, and 186). These CARs documented the results of the Contractor's Chief Engineer's review of calculations developed by Process Engineering, Mechanical Handling, Mechanical Systems, HVAC/Fire Protection, Melter Systems, and Civil, Structural and Architectural engineering organizations. The Chief Engineer's reviews were initiated as a result of the issues identified in CAR 24590-WTP-CAR-QA-02-119, which remained open pending completion of the specified corrective actions to correct the root causes of calculation performance deficiencies. The inspectors verified those root causes were also the causes of the deficiencies identified by CARs 02-180 through 184 and 02-186. The specific problems identified by CARs 02-180 through 184 and 02-186 were corrected and the CARs closed. The inspectors determined QAL item O-1 was completed as specified.

[40] Ibid 15.

The Contractor committed to conduct training on Corrective Action Reports (CARs)/Quality Assurance Information System for Engineering managers, supervisors and staff in a position to initiate or respond to CARs (QAL item O-7). The inspectors reviewed the training material and training rosters for the training conducted. The training material provided a good overview of the corrective action program and described in detail how a CAR should be filled out. Evidence provided by the Contractor demonstrated the intended population had received the training.

The Contractor committed to conduct Engineering Quality meetings to focus management attention on engineering quality issues (QAL item O-8). Six quality meeting were scheduled from November 2002 through April 2003. The inspectors reviewed the meeting minutes and attendance rosters for the November, December, January, and February meetings. Topics covered during these meetings included:

- Configuration Management
- Document Approval Process
- Calculations Metrics (Trending of calculation errors)
- Timeliness of CARs
- Design Input Memorandums.
- AB Compliance
- Process Assurance Assessments.

The inspectors concluded the topics covered during the meetings focused on the engineering performance issues identified to date. The meetings also provided a good forum for management to discuss areas needing improvement and to solicit potential solution to identified problems.

1.9.3 Conclusions

For the actions discussed above, the inspectors concluded the Contractor had implemented the committed corrective actions. However, the processes, training and the above CAR corrective actions were recently implemented. Therefore, the effectiveness of the correction actions could not be clearly demonstrated.

1.10 Adequacy of Closure of Inspection Items (IAP A-105 and A-106)

1.10.1 (Closed IR A-03-OSR-RPPWTP-002-A01 AFI) Process Assessment group to develop procedures to address the use of calculation metrics and perform assessments.

The inspectors determined the Process Assurance organization decided a separate procedure to address calculation metrics was not needed and, accordingly did not develop one. The inspectors verified the results of the calculation checker checklists were being used to determine whether the calculations checked conformed to the requirements of the procedure for Engineering Calculations. The results of the checklists were being assessed by Process Assurance to develop management information regarding error sources and frequency of occurrence. Process Assurance was presenting the results to management for determination of additional corrective action needed. This follow-up item is closed.

1.10.2 (Closed IR A-03-OSR-RPPWTP-002-A02 AFI) Contractor to complete actions to develop a method for tracking users of calculations and to notify users when changes occur.

The inspectors verified the Contractor had developed a methodology for identifying users of calculations and notifying those users when changes occur. The methodology was specified in Revision 3 of the procedure for Engineering Calculations, Section 3.8. Revision 3 was made effective February 13, 2003; accordingly, the various engineering disciplines were still in process of implementing the new requirements. This follow-up item is closed.

1.10.3 (Open IR A-03-OSR-RPPWTP-002-A03 AFI) Contractor to schedule reviews of calculations reverted to committed status to ensure timely reviews.

The inspectors verified Contractor Engineering Management had directed the discipline managers to schedule reviews of committed calculations for conversion of the calculations to confirmed status. The inspectors verified the discipline managers were in process of implementing the new requirement. The inspectors observed several calculations had been assigned dates of 2007; however, the discipline engineering management was in the process of establishing more realistic dates. Process Engineering management intended to examine the progress of this initiative during the week of March 16, 2003. Accordingly, the inspectors concluded the Contractor had taken action to assure completion of the calculation reviews to convert to confirmed status and was monitoring progress. This follow-up item remained open pending the Contractor's completion of schedules to convert all calculations to confirmed status.

2.0 EXIT MEETING SUMMARY

The inspectors presented preliminary inspection results to members of Contractor management at an exit meeting on March 13, 2003. The Contractor acknowledged the observations and conclusions. BNI agreed to perform a thorough assessment of the effectiveness of engineering work performance improvement initiatives for all disciplines performing engineering design work and submit the assessment results and any additional corrective actions deemed necessary before the first update of the PSAR following authorization for full facility construction. The inspectors asked the Contractor whether any materials examined during the inspection should be considered limited rights data. The Contractor stated no limited rights data were examined during the inspection.

3.0 REPORT BACKGROUND INFORMATION

3.1 Partial List of Persons Contacted

K. Auclair, Manager, Systems Engineering
D. Brophy, Supervisor, Staffing and Training
G. Duncan, Manager, Mechanical and Process Engineering
M. Ehlinger, QA Engineer
T. Eichorn, Mechanical Systems Discipline Calculation Specialist
T. Foote, Supervisor, Engineering Process Assurance
D. Foss, ES&H Engineer

S. Grabowski, Manager, PT Area Project Engineering
J. Hummer, Supervisor, Configuration Management
J. Julyk, Supervisor, PT Area Discipline
P. Kumar, Mechanical Systems Staff Supervisor
S. Lynch, Deputy Manager, Engineering
G. Moist, Process Assurance Engineer
J. Robinson, Engineering Training Lead
J. Roth, Manager, Engineering Processes, Procedures, and Personnel
G. Shell, manager, Quality Assurance
R. Stevens, Deputy Supervisor, PT Mechanical Systems
R. Toscetti, Manager, Engineering

3.2 List of Inspection Procedures Used

Inspection Administrative Procedure A-105, "Inspection Performance"

Inspection Administrative Procedure A-106, "Personnel Training and Qualification Assessment"

Inspection Administrative Procedure A-108, Inspection Followup System

Inspection Technical Procedure I-135, "Readiness for Construction Inspection"

3.3 List of Items Opened, Closed, and Discussed

Opened

A-03-OSR-RPPWTP-011-01-FIN	Finding	Failure to take adequat4 corrective action as required by procedures.

Closed

A-03-OSR-RPPWTP-002-A01	Assessment Follow-up Item	Program Assessment group to develop procedures to address the use of calculation metrics and perform assessments.
A-03-OSR-RPPWTP-002-A02	Assessment Follow-up Item	Contractor to complete actions to develop a method for tracking users of calculations and to notify users when changes occur.

Discussed

A-03-OSR-RPPWTP-002-A03	Assessment Follow-up Item	Contractor to schedule reviews of calculations reverted to committed status to ensure timely reviews

3.4 Documents Reviewed

Procedure 24590-WTP-3DP-G04B-00037, *Engineering Calculations*, Revision 3, dated February 13, 2003
Procedure 24590-WTP-3DP-G04B-00001, *Design Criteria*, Revision 2, dated November 22, 2002

Design Guide 24590-WTP-GPG-ENG-038, *Design Input Memorandum*, Revision 0, dated November 22, 2002

Procedure 24590-WTP-GPP-QA-601, *Quality Assurance Surveillance*, Revision 1, dated August 22, 2002

Procedure 24590-WTP-GPP-QA-201, *Corrective Action*, Revision 3, dated November 4, 2002

Drawing 24590-PTF-M5-V17T-00003, *Process Flow Diagram Waste Feed Receipt Syste*m *FRP,* Revision 1, December 31, 2002

Calculation 24590-PTF-M4C-V11T-00006, *Process Engineering Mass Balance*, Revision A, dated June 6, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-296, *Errors in Mass Balance Calculation*, dated December 23, 2002

Calculation 24590-WTP-MVC-FRP-00001, *Process Data for Waste Feed Receipt Vessels*, Revision 0, dated July 24, 2002

Calculation 24590-WTP-MPC-FRP-00027, *Process Data for FRP Pumps*, Revision 0, dated July 24, 2002

Drawing 24590-PTF-M6-HLP-00009, *P&ID-PT Facility HLW Lag Storage and Feed Blending Utility Services-Plant Wash Rack*, Revision 0, dated January 9, 2003

Design Input Memorandum 24590-PTF-M6I HLP-00009, *P&ID-PT Facility HLW Lag Storage and Feed Blending Utility Services-Plant Wash Rack*, Revision 0, dated January 9, 2003

Calculation 24590-PTF-M6C-PWD-00046, *General Line Sizing Calculations for Pretreatment Plant Wash Racks*, Revision C, dated October 7, 2002

Calculation 24590-PTF-M6C-RLD-00003, *Pipe Line Sizing Calculations*, Revision A, dated July 31, 2002

Calculation 24590-PTF-M6C-DIW-00001, *Demineralized Water Line Sizing*, Revision B, dated July 11, 2002

Calculation 24590-PTF-M6C-HLP-00001, *Pump and Line Sizing for HLP-PMP-00019A/B and 00017A/B*, Revision C, dated December 22, 2002

Drawing 24590-PTF-M6-PVP-00002, *P&ID PT Facility Pretreatment Vessel Vent Process System-Exhaust from Vessels*, Revision 0, dated December 31, 2002

Design Input Memorandum 24590-PTF-M6I-PVP-0002, *P&ID PT Facility Pretreatment Vessel Vent Process System-Exhaust from Vessels*, Revision 0, dated December 24, 2002

ABCN 24590-WTP-ABCN-ESH-02-059, *P&ID PT Facility Pretreatment Vessel Vent Process System-Exhaust from Vessels*, Revision 0, dated January 16, 2003

Calculation 24590-PTF-M6C-PVP-00002, *Vessel Vent System to Scrubber; Line Calculations*, Revision B, dated November 5, 2002

Drawing 24590-PTF-M6-RLD-00003, *P&ID-PT FacilityRadioactive Liquid Waste Disposal Effluent Collection System RLD-VSL-00017 A/B and RLD-PMP-00005 A/B*, Revision 0, dated January 8, 2003

Design Input Memorandum 24590-PTF-M6-RLD-00003, *P&ID-PT Facility Radioactive Liquid Waste Disposal Effluent Collection System RLD-VSL-00017 A/B and RLD-PMP-00005 A/B*, Revision 0, dated December 31, 2002

Calculation 24590-PTF-MPC-RLD-00014, *Pump Sizing Calculation, System RLD-RLD Pumps 00005 A/B*, Revision A, dated July 31, 2002

Calculation 24590-PTF-M6C-RLD-00002, *Pipe Line Sizing Calculations Referencing Drawings 24590-PTF-M5-V17T-00002 and 24590-PTF-M6-RLD-00003*, Revision A, dated July 31, 2002

Calculation 24590-PTF-MVC-RLD-00005, *Vessel Sizing Calculation-Alkaline Effluent Vessel RLD-VSL-00017 A/B*, Revision A, dated August 22, 2002

Drawing 24590-PTF-M6-RLD-00006, *P&ID-PT Facility Radioactive Liquid Waste Disposal System Effluent Collection RLD-VSL-00017 A/B Wash Racks*, Revision 0, dated December 31, 2002

Design Input Memorandum 24590-PTF-M6I-RLD-00006, *P&ID-PT Facility Radioactive Liquid Waste Disposal System Effluent Collection RLD-VSL-00017 A/B Wash Racks*, Revision 0, dated December 31, 2002

Calculation 24590-PTF-M6C-DIW-00001, *Demineralized Water Line Sizing*, Revision B, dated July 11, 2002

Calculation 24590-PTF-M6C-PWD-00001, *Plant Wash Pipe Sizing, Systems PWD & RLD*, Revision B, dated November 13, 2002

Drawing 24590-PTF-M5-V17T-00007, *Process Flow Diagram HLW Feed Receipt System HLP*, Revision 1, dated January 10, 2003

Design Input Memorandum 24590-PTF-M5-V17T-00007, *Process Flow Diagram HLW Feed Receipt System HLP*, Revision 1, dated January 13, 2003

Calculation 24590-PTF-MPC-HLP-00015, *Process Data Sheet Input for HLW Feed Receipt Transfer Pump HLP-PMP-00021*, Revision 0, dated July 24, 2002

Drawing 24590-PTF-M6-HLP-00002, *P&ID-PT Facility HLP System HLW Feed Receipt Vessel HLP-VSL-00022 (Q)*, Revision 0, dated February 11, 2003

Design Input Memorandum 24590-PTF-M6I-HLP-00002, *P&ID-PT Facility HLP System HLW Feed Receipt Vessel HLP-VSL-00022 (Q)*, Revision 0, dated February 11, 2003

Calculation 24590-PTF-MVC-HLP-00001, *Process Data Sheet for HLW Feed Receipt Vessel HLP-VSL-00022*, Revision 0, dated July 24, 2003

Calculation 24590-PTF-MVC-HLP-00003, *Cooling Requirements for the HLW Feed Receipt Vessel, HLP-VSL-00022*, Revision 0, dated July 18, 2002

Calculation 24590-PTF-M6C-HLP-00006, *Vessel Sizing Calculation for High Level Feed Receipt Vessel HLP-VSL-00022*, Revision A, dated June 5, 2002

Calculation 24590-PTF-M6C-HLP-00007, *Pump and Line Sizing for HLP-PMP-00021*, Revision A, dated December 31, 2002

Calculation 24590-PTF-M6C-CHW-00001, *CHW Pipe Sizing*, Revision B, dated July 22, 2002
Calculation 24590-PTF-M6C-HLP-00005, *Process Drainage Pipe Sizing, System HLP*, Revision B, dated November 15, 2002

Calculation 24590-PTF-M6C-PVP-00002, *Vessel Vent System to Scrubber; Line Calculations*, Revision B, dated November 5, 2002

Process Assurance Surveillance Letter CCN 045924, *Calculations-October Review*, dated November 15, 2002

Process Assurance Surveillance Letter CCN 047166, *Calculations-November Review*, dated December 4, 2002

Process Assurance Surveillance 24590-WTP-SV-PA-03-001, *Calculations-December 2002*, Revision 0, dated January 16, 2003

Process Assurance Surveillance 24590-WTP-SV-PA-03-002, *Calculations-January 2003*, Revision 0, dated February 4, 2003

Corrective Action Report 24590-WTP-CAR-QA-02-299, *Calculation Used Prior to Design Review Notice (DRN) Approval*, dated December 24, 2002

Corrective Action Report 24590-WTP-CAR-QA-03-001, *References in Calculations*, dated January 6, 2003

Corrective Action Report 24590-WTP-CAR-QA-03-023, *Specifications released Without Approval*, dated January 29, 2003

Corrective Action Report 24590-WTP-CAR-QA-03-007, *Design Interface Control*, dated January 15, 2003

Corrective Action Report 24590-WTP-CAR-QA-02-238, *Several Design Inputs did not Properly Document Design Inputs*, dated September 26, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-119, *Untitled but deals with discrepancies with engineering calculations*, dated June 6, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-180, *Discrepancies in CS&A Calculations*, dated august 20, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-181, *Discrepancies in Mechanical Handling Calculations*, date August 19, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-182, D*iscrepancies in Mechanical Systems Calculations*, dated August 19, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-183, *Discrepancies in HVAC/Fire Protection Calculations*, dated August 20, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-184, *Discrepancies in Melter Systems Calculations*, dated August 20, 2002

Corrective Action Report 24590-WTP-CAR-QA-02-186, *Discrepancies in CS&A Calculations*, dated August 19, 2002

Corrective Action Report 24590-WTP-CAR-QA-03-060, *Administrative Deficiencies in Calculations*, dated March 5, 2003

3.5 List of Acronyms

AB	authorization basis
ABAR	Authorization Basis Amendment Request
ABCN	Authorization Basis Change Notice
BOF	Balance of Facilities
BNI	Bechtel National, Inc.
CAR	Corrective Action Report
CM	Configuration Management
DCN	Design Change Notices
DIM	Design Input Memorandum
DOE	U.S. Department of Energy
DR	Deficiency Report

FCN	Field Change Notices
FCR	Field Change Requests
IBR	incorporated by reference
IFI	Inspection Follow-up Item
IR	Inspection Report
ITS	important-to-safety
LQI	List of Qualified Individuals
NCR	Nonconformance Reports
ORP	Office of River Protection
OSR	WTP Safety Regulation Division
OTH	Other
QA	Quality Assurance
QAL	Quality Action List
QAM	Quality Assurance Manual
QC	Quality Control
SDDR	Supplier Disposition Deviation Request
SRD	Safety Requirements Document
STARRT	Safety Task Analysis Risk Reduction Talk
TM	Training Manager
WTP	Waste Treatment and Immobilization Plant