



U.S. Department of Energy
Office of River Protection

P.O. Box 450
Richland, Washington 99352

03-AMWTP-050

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

Dear Mr. Henschel:

CONTRACT NO. DE-AC-01RV14136 – INSPECTION REPORT A-03-AMWTP-RPPWTP-001 – ON-LOCATION INSPECTION REPORT FOR THE PERIOD APRIL 22, 2003, THROUGH MAY 29, 2003

This letter forwards the results of the U.S. Department of Energy, Office of River Protection (ORP) review of Bechtel National, Inc. (BNI) construction performance on the Waste Treatment and Immobilization Plant for the period April 22 through May 29, 2003. Four Findings were identified with one requiring a written response (Enclosure 1). Details of the inspection are documented in the inspection report (Enclosure 2).

Construction performance continues to be good. Marked improvements in concrete placements were noted. The Finding requiring a response concerned failure to implement adequate corrective actions to a previous Finding and is of particular concern to ORP. An effective corrective action program is vital to ensuring construction problems are identified and corrected in an appropriate and timely manner. We understand the BNI Quality Assurance group has undertaken a root cause evaluation and has identified several procurement related problems contributing to this issue. Please include details of these problems in your written response.

If you have any questions, please contact me, or your staff may call John Eschenberg, WTP Project Manager, (509) 376-3681.

Sincerely,

Roy J. Schepens
Manager

AMWTP:JWM

Enclosures (2)

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

NOTICE OF FINDING

Section C.6, Standard 7, *Environment, Safety, Quality, and Health*, of Contract DE-AC27-01RV14136, dated December 11, 2000, between Bechtel National, Inc. (the Contractor) and the U.S. Department of Energy (DOE), defined the Contractor's responsibilities under the Contract as they relate 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 requires the Contractor to comply with the Specific nuclear regulations defined in the effective rules of the 10 CFR 800 series of nuclear requirements.

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

The Contractor's QA Program is defined in 24590-WTP-QAM-QA-01-001, "*Quality Assurance Manual*," Rev. 3a, dated May 15, 2003 (QAM).

The Contractor's QAM Policy Q-05.1, *Instruction, Procedures, and Drawings*, Section 3.1.1, stated: "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."

The Contractor's QAM Policy Q-02.1, *Quality Assurance Program*, Section 1.11.1, stated: "Suppliers who provide items, parts, materials, consumables, and/or services that are within the scope of this program shall perform work to an appropriate QA program and implementing procedures."

Standard 7, Section (d) of the Contract required the Contractor to develop and implement an integrated, standards-based, safety management program to ensure radiological, nuclear, and process safety requirements are defined, implemented, and maintained. The Contractor is required to conduct work in accordance with the Contractor developed and DOE approved Safety Requirements Document (SRD).

The Contractor's SRD, Volume 2, was defined in 24590-WTP-SRD-ESH-01-001-02, Revision 2g, dated April 16, 2003.

During the performance of on-location inspections for the period April 22 through May 29, 2003, the following Findings were identified:

1. Chicago Bridge and Iron's (CB&I's), a subcontractor supplying project materials and services, QAM QAP 9.1x, *Process Control*, Revision 0, dated July 18, 2002, paragraph 3.1.d *Process Control Drawings and Assembly Checklist*, stated, "They are used to control

and document various fabrication and construction activities such as – ii) Joint fit-up checks”.

CB&I’s QAM QAP 10.2x, *NDE, Inspection and Testing, Revision 1*, Dated July 18, 2002, paragraph 4.6, stated, “Visual and dimensional inspections shall be signed off upon completion, when required, on process control documents and, when required, documented on reports.

Contrary to the above, CB&I Quality Control inspectors accepted weld fit-ups on vessels A and B and did not document the inspections as required above. This is considered a Finding against the Contractors QAM Policy Q-02.1 regarding the requirement for CB&I to follow its quality assurance program (Finding A-03-AMWTP-RPPWTP-001-F01). (See Section 1.5.2 of Enclosure 2 for additional details.)

2. SRD, Safety Criterion 4.1-2, required conformance with ACI 349-97, *Code Requirements for Nuclear Safety-Related Concrete Structure*. ACI 349-97 paragraph 12.14.2.3 states, “Bars spliced by non-contact lap splices in flexural members shall not be spaced transversely farther apart than one-fifth the required lap splice length, nor 6 in.”

The Contractor’s engineering specification 24590-WTP-3PS-D000-T0001, *Engineering Specification for Concrete Work*, Revision 3, dated February 10, 2003, Section 3.2.2 states “Placement tolerances for reinforcement shall be in accordance with Table 2 unless noted otherwise on the project drawings.”

Drawing 24590-PTF-DO-S13T-00008, *Pretreatment Facility Structural Concrete Notes & Legend*, Revision 5, dated March 11, 2003, Note 11 states “Bars spliced by non-contact lap splices shall not be spaced transversely farther apart than one-fifth the required lap splice length, nor greater than 6 inches.”

Contrary to the above, on April 24, 2003, out-of-plane, non-contact, lap splices were identified to the Contractor in the vicinity of wall lines 12.3 to 13.2 and F.2 to H.3, below elevation -8’-0”. The Contractor’s failure to splice this rebar in accordance with the approved drawings or specifications, or obtain engineering approval for a deviation, is considered a Finding against QAM Policy Q-05.1, Section 3.1.1 for failure to follow procedures or drawings (Finding A-03-AMWTP-RPPWTP-001-F02). (See Section 1.6.2 of Enclosure 2 for additional details.)

3. Safety Requirements Document (SRD), Volume 2, Safety Criterion 4.1-2, required conformance with ACI 349-97, *Code Requirements for Nuclear Safety-Related Concrete Structure*. ACI 349-97 paragraph 12.14.3.2 states, “Except as provided in this code, all welding shall conform to *Structural Welding Code – Reinforcing Steel*, AWS D1.4.

AWS D1.4, Section 6, paragraph 6.2.1.4 states, “Any changes beyond the essential variable limitations of Table 6.1 shall require WPS requalification”. Paragraph 6.2.4.1 *Number and Type of Test Assemblies* states, “The number and type of assemblies that shall be tested to qualify a Welding Procedure Specifications (WPS) are shown in Table 6.2. The

Contractor's welding procedure P1-Rebar (0.64), Revision 0, dated February 27, 2002, was qualified using a direct butt splice, which only qualifies for direct butt splices.

Contrary to the above, the Contractor welded indirect butt splices for repair of rebar associated with wall placement LAW-0028 using welding procedure P1-Rebar. This was an unapproved and unqualified change in groove design and was an essential variable to the WPS per Table 6.2. Not having a qualified WPS for indirect butt splices also resulted in not having a qualified welder to make the indirect butt splices.

Failure to perform the indirect butt splice weld in accordance with a qualified welding procedure and a qualified welder is a Finding against QAM Policy Q-05.1, Section 3.1.1 for failure to follow procedures (Finding A-03-AMWTP-RPPWTP-001-F03). (See Section 1.6.2 of Enclosure 2 for additional details.)

4. QAM Policy Q-16.1, Section 4.3.1 stated "The QA organization shall verify implementation of corrective actions taken for all reported conditions adverse to quality and close the related corrective action documentation in a timely manner when actions are complete."

Contrary to the above, during review of closed Corrective Action Reports (CAR) 24590-WTP-CAR-QA-03-044 and 047, which documented missing weld documentation for shear studs on door liners HDH-LINER-00043 and HEH-LINER-00046 (previous ORP Finding A-03-OSR-008-F03), the Contractor failed to ensure Stud Test Reports for 1-inch studs were obtained from the vendor and included in Material Receiving Report MRR-04312. Failure to adequately close this weld documentation condition is a Finding against QAM Policy Q-16.1. (Finding A-03-AMWTP-RPPWTP-001-F08). (See Section 1.11.3 of Enclosure 2 for additional details.)

No response is required for Findings 1, 2, and 3. The Contractor has documented these Findings on appropriate corrective action documentation and the DOE Office of River Protection (ORP) will review the closure of these documents during future inspections. The ORP requests the Contractor provide, within 30 days of the date of the cover letter that transmitted this Notice, a reply to the fourth Finding described above. The reply should include: (1) admission or denial of the Finding; (2) the reason for the Finding, 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 of this nature; 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.

U.S. DEPARTMENT OF ENERGY
Office of River Protection

INSPECTION: On-location Inspection Report for the Period April 22 through May 29, 2003

REPORT NO.: A-03-AMWTP-RPPWTP-001

FACILITY: Bechtel National, Inc.

LOCATION: 2435 Stevens Center
Richland, Washington 99352

DATES: April 22 through May 29, 2003

INSPECTORS: J. McCormick-Barger, Sr. Regulatory Technical Advisor, Inspection Lead
B. Harkins, ORP Facility Representative
M. Evarts, Team Member
J. Mohatt, Team Member
D. Wallace, Team Member
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Denny Kirsch, Team Member

APPROVED BY: M. Thomas, Operations and Commissioning Team Leader
Office of the Assistant Manager Waste Treatment and Immobilization Plant
(AMWTP)

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EXECUTIVE SUMMARY

Introduction

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

- Adequacy of Material Testing Subcontractor Activities (Section 1.2)
- Adequacy of Recommendation and Issues Tracking System (RITS) and Nonconformance Report Closure Justification (Section 1.3)
- Observation of Backfill and Compaction Activities (Section 1.4)
- Adequacy of CB&I Waste Feed Receipt Tank Fabrication (Section 1.5)
- Adequacy of Forms, Reinforcement Steel, and Embedded Steel Items and Associated Concrete Placements (Section 1.6)
- Adequacy of Fire Protection Piping System Work Activities (Inspection Technical Procedure) (Section 1.7)
- Adequacy of Installation of Plant Wash and Disposal Tanks (PWD-VSL-00045 and PWD-VSL-00046) (Section 1.8)
- Adequacy of Balance-of-Plant Construction Activities (Section 1.9)
- IH&S Oversight (Section 1.10)
- Review of Assessment Follow-up Items (Section 1.11)

Significant Observations and Conclusions

- The new materials testing subcontractor had established and was in the early phases of implementing their Quality Assurance (QA) program onsite. Four minor problems (non-cited Findings) were identified and quickly corrected. The four problems did not seriously affect the quality of any materials testing activities because of the early phase of the subcontractor's mobilization and testing performance. Once these items were corrected, the subcontractor's programs and procedures, site personnel, and testing equipment complied with established QA and authorization basis requirements. (Section 1.2)
- Recommendation and Issues Tracking System (RITS) items examined did not contain issues, which should have been processed using traditional quality assurance program identification and tracking mechanisms. Further, the closure justifications for Non Compliance Reports (NCR) examined were acceptable and conformed to established QA

provisions. (Section 1.3)

- The Contractor had provided adequate implementing procedures specifying the method to be employed for backfill and compaction efforts, which reflected the applicable codes and standards specified in SRD SC 4.1-2. Soil testing was performed using calibrated testing equipment. Test results were documented per the Contractor's specifications and procedure. (Section 1.4)
- With one exception, CB&I established and implemented provisions onsite to assure welding and radiography of the waste receiving tank construction activities were being conducted in accordance with SRD, American Society of Mechanical Engineers (ASME) Section VIII, ASME Section V, and QA manual requirements. One Finding was identified for failure of CB&I to document fit-up inspections as required by CB&I QAM (Finding A-03-AMWTP-RPPWTP-001-F01). (Section 1.5)
- Concrete testing was performed in accordance with the technical specifications, procedures, and applicable American Society for Testing and Materials (ASTM) requirements. (Section 1.6)
- Reinforcement steel and other attributes associated with the concrete placements for the Low Activity Waste (LAW), High Level Waste (HLW), and Pretreatment Facility (PTF) were normally performed in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing Quality Control (QC) activities for this work, and QC activities were documented as required by procedures. One Finding was identified for failure to follow procedures regarding installing unspecified out-of-plan, non-contact, splices in the PTF pit walls, south tunnel (A-03-AMWTP-RPPWTP-001-F02). (Section 1.6)
- The Contractor did not have a qualified welding procedure or a qualified welder to make the indirect butt splices the Contractor completed in an LAW interior wall. This was a Finding for failure to follow procedures (A-03-AMWTP-RPPWTP-001-F03). (Section 1.6)
- The Contractor had accomplished hydrostatic testing of fire service water piping systems in accordance with established requirements. (Section 1.7)
- The Contractor acceptably installed the anchor bolts and stainless steel liner plates for the PTF Plant Wash and Disposal (PWD) tanks in accordance with the requirements of the design drawing, ASME Section IX, and American Welding Society (AWS) D1.6 Code. (Section 1.8)
- PTF conduit installations and grounding installations conformed to governing installation requirements including the 2002 NEC. (Section 1.9)

- After some minor corrections, subcontractor (Grant Construction) assured grounding program met 29 CFR 1926.404(b)(1) requirements. (Section 1.9)
- Substation # 8, 1500 KVA Transformer and 480-volt switchgear, located southeast of the LAW building, did not comply with grounding requirements of NEC-2002, Article 250.32(B)(1). Corrective actions to address this issue are being tracked as Assessment Follow-up Item A-03-AMWTP-001-A04. (Section 1.9)
- After inspectors notified the Contractor of NEC Article 215.10 requirements to test the Ground Fault Protection system of substations after installation, the performance testing was completed and deficiencies were corrected. (Section 1.9)
- Ice Trailer overcurrent protection did not meet NEC Article 240.4 requirements; the Contractor order the proper overcurrent protection and plans to install the devise once it arrives. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A05. (Section 1.9)
- The Office Supply Storage Connex, Law Craft Change House, the Septic Drain Field, Power Distribution Rack PDR-001, and General Distribution Rack GDR-002 electrical installations were in accordance the 2002 NEC. (Section 1.9)
- Electrical service to the T28 building did not comply with NEC Article 2002, Article 110.26 because the display board covering the panelboard did not allow the three-foot working clearance requirement. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A06. (Section 1.9)
- The temporary power installed for Mask Wash Trailer T42 did not comply with NEC Article 2002, Article 422.31(B) in that the circuit breaker feeding the water heater was not within sight of the water heater nor was it capable of being locked in the open position. The Contractor was procuring a lockout device. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A07. (Section 1.9)
- Balance-of-Plant (BOP) rebar and embedded item placement for the north and south center slabs of building T-41 Mechanics Shop, Switchgear Building # 87 Grade Beam (south beam), and Electrical Duct Banks were installed in accordance with technical specifications, procedures, and required codes and standards. (Section 1.9)
- Concrete for the Mechanics Shop, Switchgear Building, and Electrical Duct Banks was produced, placed, and consolidated in accordance with technical specifications, procedures, and required codes and standards. (Section 1.9)
- The Contractor accomplished hydrostatic testing of PVC Potable Water Piping in accordance with established requirements. (Section 1.9)

- The 48-inch Cooling Water System was installed in accordance with specifications, procedures, and manufacturer's recommendations. (Section 1.9)
- The subgrade for the cooling tower was proof rolled and the top (12) inches were compacted, tested, and documented in accordance with the Contractor specification. (Section 1.9)
- Hydrostatic tests of the Plant Wash and Disposal System segments were conducted in accordance with approved procedures and met acceptance criteria. (Section 1.9)
- Corrective actions to address the Link Belt Model LS 278 crane luffing incident were adequately implemented and the crane was configured for luffing operations and successfully tested and placed in service. (Section 1.10)
- Contractor actions to address minor Industrial Health and Safety concerns with the Potain Tower Crane continued. Additional actions were needed to obtain a variance from DOE for nonconforming ladder ways and address footwalk structural concerns. (Section 1.10)
- The Potain Tower Crane elevators were being installed and tested in accordance with manufacturer's instructions. (Section 1.10)
- Although the majority of the Job Hazards Analyses (JHA) reviewed were satisfactory, problems were found with unsigned and undated JHAs, JHAs in use without review/approval by Safety, old versions of JHAs in use, JHA sign-in sheets found without JHA numbers, and some examples of inappropriate JHA use. The Contractor revised the JHA procedure to address these issues. (Section 1.10)
- One Finding, two assessment follow-up items, and one occurrence report were closed. One Finding was identified regarding inadequate actions to address a previous Finding (A-03-AMWTP-001-F08). (Section 1.11)

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**ON-LOCATION INSPECTION REPORT FOR THE PERIOD
APRIL 22 THROUGH MAY 29, 2003**

1.0 REPORT DETAILS

1.1 Introduction

This inspection assessed the Contractor's and subcontractors' performance of important-to-safety (ITS) construction activities for conformance with regulatory requirements specified in the Quality Assurance Manual (QAM), Safety Requirements Document (SRD), design documents, approved work procedures, and committed codes and standards. The inspection also reviewed the Contractor's implementation of firewater piping system construction activities, aspects of its Industrial Health and Safety (IH&S) program, including observing Contractor and subcontractor worker safety practices, and performance of Balance-of-Plant (BOP) construction activities not classified as ITS.

Details and conclusions regarding this inspection are described below.

1.2 Adequacy of Materials Testing Subcontractor Activities

1.2.1 Inspection Scope

The inspectors examined: (1) the scope and depth of the Contractor's activities to provide assurance the materials testing subcontractor (Quality Inspection Services Inc. (QIS)) was ready to perform testing activities; (2) selected portions of the subcontractor's QAM to verify conformance with the Contractor's QAM (24590-WTP-QAM-QA-01-001, "Quality Assurance Manual," Rev. 3a, dated May 15, 2003); (3) selected subcontractor QA implementing procedures to verify these conformed to the requirements of the subcontractor's QAM; and (4) selected subcontractor activities for conformance with the QAM and QA implementing procedure requirements. The inspectors reviewed documentation applicable to the selected activities and interviewed responsible personnel.

1.2.2 Observations and Assessments

In support of this review, the inspectors reviewed the following documents:

- QISI QAM, Revision 4, dated August 19, 2002.
- QISI Quality Assurance Procedure (QAP) 2.1, *Indoctrination Procedure*, Revision 1, dated September 13, 2002.
- QISI QAP 2.2, *Qualification of Audit Personnel*, Revision 2, dated September 13, 2002.
- QISI QAP 4.1, *Procurement Control*, Revision 3, dated September 6, 2002.

- QISI QAP 6.1, *Certification of Inspection, Examination and Testing Personnel* Revision 4, dated January 31, 2003.
- QISI QAP 7.1, *Receipt Inspection Procedure*, Revision 1, dated September 13, 2002.
- QISI QAP 12.1, *Control of Measuring and Test Equipment*, Revision 1, dated September 13, 2002.
- QISI QAP 13.1, *Material Handling, Shipping, and Storage*, Revision 1, dated September 13, 2002.
- QISI QAP 15.1, *Control of Nonconformances*, Revision 1, dated September 13, 2002.
- QISI QAP 16.1, *Corrective Action Request*, Revision 1, dated September 13, 2002.
- QISI procedure QAP 17.1, *Quality Assurance Records*, Revision 2, dated September 13, 2002.
- QISI procedure QAP 18.1, *Quality System Audits*, Revision 2, dated September 6, 2002.
- QISI procedure QAP 18.2, *Quality Assurance Program Assessments*, Revision 0, dated September 5, 2002.

The Contractor had selected QISI, a new materials testing subcontractor, to replace the previous subcontractor. The Contractor had performed supplier audits, placed the subcontractor on the Approved Supplier List (ASL), and examined the subcontractor's QA implementing procedures and material testing procedures to provide assurance the new subcontractor would properly implement the QA and technical requirements when released to perform work.

The inspectors examined the scope, depth, and findings of the Contractor's QA program review of QISI to assess the assessment substance and issues identified. The Contractor documented the results of the review by memo, dated August 28, 2002 (CCN 039075). The Contractor reviewed the QISI QAM, Revision 4, dated August 19, 2002, and identified five deficiencies, which were immediately corrected and closed. The inspectors concluded the Contractor's QA program review was of adequate scope and depth to objectively determine the acceptability of the QISI QAM and implementing procedures. The Contractor placed QISI on the ASL on October 1, 2002, following completion of two supplier surveys. The inspectors examined the scope and findings of the supplier surveys and concluded these provided adequate justification for inclusion on the ASL.

The Contractor had performed an audit of QISI prior to this inspection; however, the report had not yet been issued.

The inspector examined the QISI QAM and several implementing procedures, identified above. The inspectors concluded the QISI QAM implemented and conformed to the requirements provided by the Contractor's QAM.

QISI was in the process of conducting their corporate assessment of their activities and planned to complete the assessment within the week of this inspection. In addition, QISI was performing an assessment of their implementation of work activities and planned to complete the assessment within the week.

The inspectors selected certain requirements of the QISI QAM and the corresponding Quality Assurance Procedure (QAP) specifying the implementation details in several areas, identified below, for verification of accomplishment in accordance with the QAM and QAP requirements.

Procurement Control

The inspectors examined three, of a total of four, QISI procurement documents to assess whether selected requirements of the QAM and QAP had been accomplished, as required. The procurements selected for examination were (1) Purchase Order 4635, *Concrete Cylinder Molds and Caps*, dated April 3, 2003; (2) Purchase Order 4553, *Calipers, 25 and 50 Pound Weights*, dated February 25, 2003; and (3) Purchase Order 4598, *Calibration Services for M&TE* [Measuring and Test Equipment], dated March 13, 2003. The inspectors found the documents conformed to the three selected QAM and three selected QAP requirements, with the exception of the calipers.

Purchase Order 4553 required traceability of calibration to National Institute of Standards and Technology (NIST) standards. The inspectors verified the weights were provided with NIST traceability; however, the NIST traceability was not available for the calipers (M&TE item Q-0874). QISI had completed their receiving inspection for the calipers and had placed them in the M&TE storage area. The receiving inspection for the calipers failed to identify the missing NIST traceability; although, NIST traceability was a requirement of the purchase order and receipt inspection requirements. The QISI QA Manager immediately removed the calipers from the M&TE storage area and placed the item in quarantine. The QA Manager determined the calipers had not been used to conduct any inspections.

The QISI QAM, Section 12, *Control of Measuring and Test Equipment*, Revision 4, dated August 19, 2002, paragraph 12.1.5, required calibrations shall be performed using standards traceable to nationally recognized standards; such as NIST. In addition, paragraph 12.1.11 required a certificate of calibration shall be required for each item calibrated by a subcontracted supplier and shall include a statement indicating the equipment was calibrated in accordance with NIST. Contrary to these requirements, M&TE item Q-0874 (18 inch calipers) were not provided to the QISI site with calibration information traceable to NIST.

The QISI QA Manager wrote Nonconformance Report 03-001 on April 22, 2003, documenting the nonconformance with the resolution to obtain the required NIST traceability documentation. The inspectors examined this first nonconformance documented by QISI and concluded the NCR conformed to the applicable requirements of the QISI QAM, Section 15, *Control of Nonconforming Items*, and QAP 15.1, *Control of Nonconformances*.

The above situation would be considered a Finding; however, because the issue was not programmatic, was entered into the corrective action program, and the issue was corrected in a timely manner, this Finding was not cited.

Control of Purchased Material, Equipment, and Services

The inspectors selected four requirements of the QISI QAM, Section 7, *Control of Purchased Material, Equipment and Services*, and seven requirements of QISI QAP 7.1, *Receiving Inspection Procedure*, for verification of accomplishment in the field. The inspectors examined documentation and interviewed QISI personnel to assess whether the selected requirements had been accomplished as specified. With the exception of the inadequate receipt inspection performed on the eighteen-inch calipers, discussed above, the inspectors concluded QISI had adequately implemented the selected requirements.

Identification and Control of Materials, Parts, and Components

The inspectors selected two requirements of the QISI QAM, Section 8, *Identification and Control of Materials, Parts, and Components*, for implementation verification. The inspectors examined documentation and interviewed QISI personnel to assess whether the selected requirements had been accomplished as specified. The inventory of received material was limited. The inspectors selected measuring and test equipment receipt and concrete cylinder molds and caps for examination to verify conformance with the selected QAM requirements. The inspectors found each inspected received item was identified in the M&TE log by sticker/label/tag number, containing the required information. However, not all M&TE was tagged as required, as discussed below. The concrete cylinder molds and caps had been tagged as required. With the exception of M&TE, the inspectors concluded QISI had implemented the selected requirements.

Control of Measuring and Test Equipment

The inspectors examined the requirements regarding control of measuring and test equipment specified by the QISI QAM, Section 12, and QAP 12.1. The inspectors examined conformance with the requirements of QAM Section 12.1.1 through 12.1.11 and all requirements of 12.2.1. The inspectors examined conformance with QAP 12.1 regarding the M&TE Log, calibration dates, calibration due dates, and equipment identification. The inspectors examined documentation and interviewed QISI personnel to assess whether the selected requirements had been accomplished as specified.

The inspectors found the M&TE log was established and maintained as required and a system for recall of M&TE for calibration had been established. The inspectors further determined the usage of M&TE was logged on the test reports by equipment number and calibration due date and the system used would facilitate identification of testing conducted using the equipment in the event a piece of M&TE was found out of calibration.

The inspectors examined the calibration documentation of two bimetallic thermometers (items Q-0854 and 0856), an air pressure meter (item Q-0784), two nuclear density gauges (items Q-0177 and 0608), one concrete air pressure meter (item Q-0163), and one reference thermometer

(Q-0817). The inspectors found the equipment was calibrated, the calibration date and due dates matched the M&TE log, and calibration standards were traceable to NIST standards.

The inspectors examined the M&TE located in the M&TE storage area. The inspectors observed the M&TE storage location was an unsecured shelving area in the materials testing laboratory. The inspectors examined the M&TE located on the storage shelves and observed the following:

- Two sand cones (items Q-0891 and 0893) had no calibration sticker attached. The inspectors examined the calibration documentation and log with the QA Manager and observed the equipment had been calibrated and was within the calibration period. The QA Manager immediately placed the required stickers on the sand cones, correcting the problem. The QA Manager stated the stickers probably fell off during use in the field and stated the intent to cover the stickers with a clear, highly adhesive tape to preclude similar situations. The QAP 12.1, Section 6.4 requires a calibration sticker be attached to the equipment or its container.
- The inspectors observed there was four Proctor molds located adjacent to each other in the storage area. The inspectors observed there was no calibration sticker on 3 of the 4 molds. The M&TE log only identified two molds (Q-0657 and 0658) as calibrated, and Q-0658 had no calibration sticker attached. The inspectors inquired of the soils testing technician which molds had been used for testing and learned only Q-0658 had been used. The QA Manager stated the stickers probably fell off during use in the field and stated the intent to cover the stickers with a clear, highly adhesive tape to preclude similar situations. The QA Manager took immediate action to verify Q-0658 was calibrated, within the calibration period, and placed a new sticker on the equipment. The QA Manager removed the Proctor molds not identified on the M&TE log to a quarantined storage area.

The above situations would be considered a Finding; however, because these issues were not programmatic and were corrected in a timely manner the Finding was not cited.

Test Control

The inspectors observed the QISI QAM, Section 11, *Test Control*, paragraph 11.6, identified eleven attributes, as a minimum, that must be recorded on test records. Specification 24590-BOF-3PS-C000-T0001, *Material Testing Services*, Revision 2, dated July 12, 2002, Section 2.3 identified fourteen attributes that must be included in all test reports. The inspectors compared the lists and concluded the QAM list did not match the listing of the specification. The Contractor also identified this issue during their review of QISI procedures. The QISI QA Manager stated the QAM would be revised to reflect the specification requirements and test record forms would be revised, as necessary, to conform to specification requirements. The inspectors verified QISI had established procedures specifying the test requirements and, based upon a sample of the test procedures, concluded the procedures implemented the appropriate ASTM testing requirements. The inspectors verified the Contractor had reviewed, commented, and accepted the content of the test procedures.

Qualification of Test Personnel

The inspectors examined the implementation of selected attributes provided by the QISI QAM, Section 10, *Inspection*, and QAP 6.1, *Certification of Inspection, Examination, and Testing Personnel*. The inspectors examined documentation and interviewed QISI personnel to assess whether the selected requirements had been accomplished as specified.

The QISI QA Manager stated all QISI test technicians were classified as test personnel and subject to the requirements of the QAM, Section 10, paragraph 10.3.4, regarding the qualification of test personnel. Section 10.3.4 required documenting qualification on a form including certain required information. One item of information required stated merely 'method of activities.' The QA Manager could not explain what this item meant and determined to delete the requirement. The inspectors examined the form used to document personnel qualification and concluded all the information required by Section 10.3.4 was included, with the above exception.

The inspectors examined the qualification documentation of all QISI test personnel, a total of eight persons certified to perform civil testing. QISI QAP 6.1, Section 6, defined the minimum education and experience requirements for Level I, II, and III test personnel. QISI had no Level III personnel on site; only Level I and Level II personnel. The inspectors found, while the resumes documented certain education levels, the onsite personnel files for 5 new hires did not have the documentation to verify previous employment or education. QAP 6.1, Section 7.1, required previous employment/experience shall be documented and verified by certification papers, a letter from the previous employer(s), or by a documented telephone memorandum between the previous employer(s) and the Quality Assurance Manager, or designee. The inspectors observed Section 7.1 was silent regarding the means of verification of education. The QA Manager stated the section would be appropriately revised to include such verification. The QA Manager wrote Corrective Action Request 03-001, dated April 22, 2003, documenting the failure to verify education or experience.

The Contractor performed a surveillance to verify certifications, work experience, and education of QISI personnel (Surveillance Report 24590-WTP-SV-QC-03-141, *WTP QC Surveillance of QIS Test Technician Qualification*, Revision 0, dated April 22, 2003). The QISI QA Manager verified, and documented by memorandum dated April 22, 2003 to training files, the work experience and education claims of the test technicians in question. The Contractor's surveillance verified the work experience and education claims for the technicians in question had been completed as required by QAP 6.1.

The above situations would be considered a Finding; however, because these issues were not programmatic, was entered into the corrective action program, and the issues were corrected in a timely manner a Finding was not cited.

QAP 6.1, Section 6.5, provided requirements for qualification of Senior Inspector personnel. The inspectors observed the industry standards governing the qualification of inspection and testing personnel did not recognize the Senior Inspector classification. The QISI QA Manager stated this was a company internal classification and related to pay only; however, should a Senior Inspector be used on testing activities, they would have to meet the recognized criteria for

Level I, or II qualification. The QA Manager stated the Senior Inspector section did not belong in this procedure and would be deleted.

The inspectors verified the personnel qualification files contained documentation of vision testing of visual acuity and color vision, as required by QAP 6.1, Section 8.

Verification of Lesson Learned

The inspectors identified a situation, during the readiness assessment of the concrete supplier, regarding the implementation of acceptance criteria for fineness modulus established during conduct of fine aggregate gradation testing. ASTM C 33, *Standard Specification for Concrete Aggregates*, 2001 Edition, required in Section 6.4 “For continuing shipments of fine aggregate from a given source, the fineness modulus shall not vary more than 0.20 from the base fineness modulus.” The base fineness modulus for the source was established during the concrete mix design process as 2.84; therefore, establishing acceptance criteria of 2.64 to 3.04. The inspectors documented the inspections and corrective actions in ORP Inspection Report IR-02-008, dated August 26, 2002.

Specification 24590-BOF-3PS-C000-T0001, *Engineering Specification for Material Testing Services*, Revision 2, dated July 12, 2002, Section 1.4.3, required conformance with ASTM C 33, 2001 Edition. The inspectors examined the gradation testing forms used by QISI and determined the form provided no acceptance criteria, identical to the situation identified for the concrete supplier. The QISI QA Manager took immediate action to add the fineness modulus acceptance criteria to the form documenting the results of gradation testing.

The inspectors concluded the Contractor failed to apply the lessons identified during previous inspections to the new materials testing subcontractor. The above situations would be considered a Finding; however, because this issue was not programmatic, was entered into the corrective action program, and was corrected in a timely manner a Finding was not cited.

Quality Assurance Records

During the course of this inspection, the inspectors examined several quality records covering the areas of procurement purchase orders; receipt inspection; M&TE logging, calibration, and NIST traceability; and personnel qualification. The records were all legible, complete, identifiable, retrievable, properly approved, and stored in proper storage, as required by the QAM Section 17, *Quality Records*.

The inspectors found the records were protected against damage, deterioration, and loss, and were properly indexed, classified, and stored in accordance with QAM Section 17. The inspectors examined the record storage container and found the container was a one-hour fire rated file cabinet meeting the requirements of QAP-17.1, Section 6.1. Access to the storage facility was controlled through the use of keys only issued to the QA Manager and one other person.

The inspectors concluded the quality of the records examined and the storage conditions conformed to established requirements.

Qualification of Audit Personnel and QA Audits

The inspectors examined the QISI plans for audits and the qualification records of the audit personnel. The inspectors evaluated several attributes and requirements provided by the QAM, Section 18, *Audits*, and QAP 18.2, *Quality Assurance Program Assessments*, and QAP 2.2, *Qualification of Audit Personnel*.

The inspectors found an annual assessment, required by QAP 18.2, was in progress and planned to complete by April 25, 2003. The Civil Manager had reviewed the testing procedures for concrete and soils, as required by QAP 18.2. The inspectors examined the subcontractors audit schedule for 2003 and concluded it conformed to established requirements.

The inspectors found QISI only used persons qualified as lead auditor to perform audits. The inspectors determined there were two lead auditors designated by the subcontractor as qualified; however, the back up documentation for one was not on site and was being sent to the site by the QISI home office; the other lead auditor qualification documentation was acceptable. No audits by QISI of the WTP materials testing operation had been performed to date.

1.2.3 Conclusions

The inspectors concluded the subcontractor had established and was in the early phases of implementing their QA program on site. Accordingly, the inspectors found four minor problems in program implementation that were easily and quickly corrected. Further, the four problems found had not seriously affected the quality of any materials testing activities because of the early phase of QISI mobilization and testing performance. The inspectors found an isolated instance of a failure to provide traceability to NIST standards for one piece of test equipment, a few minor problems with the marking of M&TE, and a few minor problems with the documentation required to demonstrate the experience and education of testing staff. In each case, these issues were classified as non-cited Findings.

1.3 Adequacy of Recommendation and Issues Tracking System (RITS) and Nonconformance Report Closure Justification

1.3.1 Inspection Scope

The inspectors examined whether the RITS system contained any issues requiring resolution using established quality assurance processes, such as Corrective Action Reports (CARs) or Nonconformance Reports (NCRs), by reviewing a sample of RITS system items. In addition, the inspectors examined a sample of closed nonconformance reports to assess whether adequate justification was provided for closure.

1.3.2 Observations and Assessments

The inspectors found the RITS system had been implemented for slightly over one year and the guide for implementing and using the system was still in draft. Each major organization had a

RITS Coordinator responsible for maintaining the system in their particular area. There were about 400 RITS entries closed and about 165 still open. The system provided for reminders when any particular item becomes overdue. The inspectors sampled and examined the Engineering and Construction organizations' closed items, closed since January 2003, and found no items misclassified (should have been classified as CARs or NCRs).

The inspectors examined the closure justification for NCRs 24590-WTP-NCR-CON-03-001, 002, 005, 006, 008, 009, 011, 012, 013, 014, 015, 016, 018, 019, 020, and 021. The inspectors concluded the justifications for closure were acceptable and conformed to established quality assurance provisions.

1.3.3 Conclusions

The inspectors concluded the RITS system items examined did not contain items, which should have been processed using traditional quality assurance program identification and tracking mechanisms. Further, the inspectors concluded the closure justification for the NCRs examined were acceptable and conformed to established quality assurance provisions.

1.4 Observation of Backfill and Compaction Activities (ITP I-112)

1.4.1 Inspection Scope

The inspectors examined the Contractor's programs and procedures governing the conduct of backfill and observed backfilling operations around the north side of the LAW to verify soil compaction was being conducted in accordance with industry codes and standards specified in SRD, Volume II, Safety Criteria (SC) 4.1-2.

1.4.2 Observations and Assessments

The inspectors examined the following documents governing the conduct of backfill and compaction for the LAW:

- 24590-BOF-3PS-CE01-T0001, *Engineering Specification for Excavation and Backfill*, Revision 4, dated March 17, 2003.
- 24590-BOF-3PS-C000-T0001, *Engineering Specification For Material Testing Services*, Revision 2, dated July 12, 2002.
- 24590-LAW-DB-S13T-00003, *LAW Vitrification Building Main Building Concrete Key Plan at El (-) 21'-0"*, Revision 6, dated November 26, 2002.
- 24590-LAW-A1-A10T-01300001, *LAW Vitrification Building Architectural Elevator Plans and Sections*, Revision 0, dated October 18, 2002.

Based upon the above examinations the inspectors determined the Contractor continued to provide adequate implementation procedures for ITS backfill, adequate design drawings to

assure location of ITS backfill, adequate provisions to assure only acceptable backfill would be placed, and adequate provisions for testing and documenting density test results.

The inspectors observed backfill (12 inch loose lift) and compaction on the north side of the LAW at elevation 668.64' and 672.07'. The inspectors observed addition of water to the backfill material for compaction and dust control purposes. The inspectors verified the Contractor performed backfill and compaction per above listed drawings and specifications. The inspectors verified the Contractor's soil density testing equipment was currently calibrated. The inspectors witnessed the Contractor perform density testing with a calibrated density gauge. The inspectors reviewed the Contractor's *In Place Density & Moisture Test Report* and verified acceptable density and moisture test results were documented.

1.4.3 Conclusions

The inspectors concluded the Contractor had provided adequate implementing procedures specifying the method to be employed for backfill and compaction efforts, which reflected the applicable codes and standards specified in SRD SC 4.1-2. The inspectors verified soil testing was performed using calibrated testing equipment. Test results were documented per the Contractor specifications and procedure.

1.5 Adequacy of CB&I Waste Feed Receipt Tank Fabrication (ITP I-120 and 121)

1.5.1 Inspection Scope

The inspectors examined the Contractor's work activities governing the final documentation for welding and non-destructive examination of waste receiving tank weldments for conformance with the CB&I QAM, ASME Boiler and Pressure Vessel Code Section VIII, 1998 Edition, and ASME Boiler and Pressure Vessel Code Section V, 2001 Edition, Article 2, required by SRD Volume II, Safety Criterion 4.2-2.

1.5.2 Observations and Assessments

The inspectors performed a general overview of in process welding documentation for Vessel A, ring 4, vertical welds A thru E. The inspectors verified the sub-contractor was documenting the material used, welding electrode, welder, weld inspections, and Non Destructive Examination (NDE) inspections. The inspectors concluded the sub-contractor was documenting the required information as required by the QA manual and procedures except for fit-up inspections. The sub-contractor was performing fit-up inspections and writing on the vessel "ok to weld" and not documenting the results. CB&I's QAM QAP 9.1x, *Process Control*, Revision 0, dated July 18, 2002, paragraph 3.1.d *Process Control Drawings and Assembly Checklists*, stated, "They are used to control and document various fabrication and construction activities such as – ii. Joint fit-up checks". CB&I's QAM QAP 10.2x, *NDE, Inspection and Testing*, Revision 1, dated July 18, 2002, paragraph 4.6, stated "Visual and dimensional inspections shall be signed off upon completion, when required, on process control documents and, when required, documented on reports.

CB&I revised existing NCR H1 to revision 2 to address the above situation. The Contractor issued a new NCR, 24590-WTP-NCR-CON-03-099, to document this deficiency.

This is considered a Finding against the Contractor's QAM Policy Q-02.1 regarding the requirement for CB&I to follow its quality assurance program (Finding A-03-AMWTP-RPPWTP-001-F01).

1.5.3 Conclusions

With one exception, the inspectors concluded CB&I had established and implemented provisions onsite to assure welding and radiography of the waste receiving tank construction activities were being conducted in accordance with SRD, ASME Section VIII, ASME Section V, and QA manual requirements. One Finding was identified for failure of CB&I to document fit-up inspections as required by CB&I QAM (Finding A-03-AMWTP-RPPWTP-001-F01).

1.6 Adequacy of Forms, Reinforcement Steel, and Embedded Steel Items and Associated Concrete Placements (ITP I-113)

1.6.1 Inspection Scope

The inspectors examined the Contractor's and subcontractor's procedures and engineering technical specifications governing the installation of reinforcement steel, embedment plates, and structural concrete, to determine whether the specified activities conformed to the authorization basis (AB) and industry codes and standards, specified in the SRD, Volume II, Safety Criterion 4.1-2. Further, for the following placements, the inspectors examined the installations of reinforcing steel and concrete placement activities in the field to assess whether those activities had been conducted in accordance with Contractor program, procedure, and AB requirements.

- Concrete Pour Card - HLW-0016
- Concrete Pour Card - HLW-0031
- Concrete Pour Card - LAW-0038
- Concrete Pour Card - LAW-0039
- Concrete Pour Card - LAW-0042
- Concrete Pour Card - LAW-0044
- Concrete Pour Card - PTF-C-0008-2-B
- Concrete Pour Card - PTF-C-0008-2-C
- Concrete Pour Card - PTF-C-0009-1-A
- Concrete Pour Card - PTF- C-0011-3
- Concrete Pour Card - PTF-C-0014
- Concrete Pour Card - PTF-C-0030
- Concrete Pour Card - PTF-C-0031
- Concrete Pour Card - PTF-C-0033
- Concrete Pour Card - PTF-C-0035/Elevator Pit.

1.6.2 Observations and Assessments

The inspectors examined the following documents governing the installation and inspection of ITS structural concrete:

- 24590-WTP-DD-S13T-00009, *Civil/Structural Standards Wall Penetration Details*, Revision 4, dated February 27, 2003
- 24590-WTP-DG-S13T-00005, *Civil/Structural Standards Concrete Reinforcement Details*, Revision 2, dated April 24, 2003
- 24590-WTP-3PS-D000-T0001, *Engineering Specification For Concrete Work*, Revision 3, dated February 10, 2003
- 24590-WTP-3PS-DB01-T0001, *Engineering Specification For Furnishing and Delivering Ready-Mixed Concrete*, Revision 5, dated February 10, 2003
- 24590-BOF-3PS-C000-T0001, *Engineering Specification For Material Testing Services*, Revision 2, dated July 12, 2002
- 24590-WTP-3PS-FA01-T0001, *Engineering Specification For Furnishing of Anchor Bolts (Rods)*, Revision 1, dated February 5, 2002
- 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 4, dated April 24, 2003
- 24590-PTF-DG-S13T-00016, *Pretreatment Facility Structural Concrete Reinforcement Partial Plan EL 0'-0" SH 3*, Revision 4, dated January 13, 2003
- 24590-PTF-DG-S13T-00026, *Pretreatment Facility Structural Concrete Reinforcement Sections*, Revision 6, dated May 8, 2003
- 24590-PTF-DG-S13T-00014, *Pretreatment Facility Structural Concrete Reinforcement Partial Plan EL 0'-0" SH 1*, Revision 6, dated April 14, 2003
- 24590-PTF-D0-S13T-00008, *Pretreatment Facility Structural Concrete Notes & Legend*, Revision 5, dated March 11, 2003.

The inspectors concluded the documents described above continued to conform to the Codes and Standards required by SRD Safety Criterion 4.1.2, and contained the necessary installation requirements to perform the work.

In preparation for walk downs of recently installed reinforcement steel and other components incorporated within the placements described above, the inspectors examined drawings in the areas of concrete reinforcement, forming, and arrangement, and examined construction work activities associated with the placements for conformance with the requirements of the applicable

drawings. The inspectors concluded the drawings were the most current revisions at the time of the walk down.

Installation of Forms, Reinforcement Steel, and Embedments

For the placements listed in Section 1.5.1 above, the inspectors witnessed in-process final inspections of installed forms, reinforcement steel, and embedments performed by Quality Control (QC) inspectors. These inspections included verifying embed plates, form configuration, clear cover requirements, reinforcement placement, splice lengths, joint preparation, and final clean up conformed to applicable drawings and procedure requirements. In addition, the inspectors performed a general inspection of the above items and other attributes shown on the drawings applicable to the items being inspected.

The inspectors identified to the Contractor various locations of missing or misplaced reinforcement steel. For example, the inspectors identified missing rebar in the PTF North Tunnel Basemat. The Contractor generated a Field Change Request (FCR), number 24590-WTP-FCR-C-03-116, Revision 0. This FCR corrected the missing rebar by allowing the Contractor to install the rebar without having to remove the forms. This FCR was approved and the reinforcement was corrected before the concrete placement was made. The inspectors identified to the Contractor out-of-plane, non-contact, lap splices in the PTF pit walls, south tunnel. The Contractor generated an FCR, number 24590-WTP-FCR-C-03-104, Revision 0 to address this splice. The FCR was approved, authorizing the splice, before the concrete pour card was signed indicating the placement was ready for concrete. In addition, a Non Conformance Report, number 24590-WTP-NCR-CON-03-082, was issued to address a previous placement where a non-contact, out-of-plane, splice had been used and concrete had been placed. QAM Policy Q-05.1, Section 3.1.1 states activities affecting quality shall be prescribed by and performed in accordance with documented instructions, procedures, and drawings. Failure to splice rebar in accordance with approved drawings or specifications, or obtain engineering approval for a deviation (i.e., out-of-plane, non-contact, lap splices) is considered a Finding against QAM Policy Q-05.1, Section 3.1.1 (Finding A-03-AMWTP-RPPWTP-001-F02).

During a general surveillance of reinforcement steel on wall placement LAW-28, the inspectors noted the Contractor lap splice welded two horizontal reinforcement bars to repair cut horizontal bars per NCR 24590-WTP-NCR-CON-03-073. When the inspectors attempted to verify the Contractor had a qualified welding procedure and a qualified welder to perform the repair, the inspectors noted the welding procedure the Contractor had specified for welding reinforcement was for direct butt weld splices only. The above NCR directed the Contractor to lap splice the two reinforcement bars together. The welding procedure, specified by the Contractor to perform the repair, P1-Rebar (0.64 CE), Revision 0, dated February 27, 2002, was qualified using a direct butt splice. AWS D1.4-98, *Structural Welding Code – Reinforcing Steel*, Section 6, Table 6.2, *Number and Type of Tests for WPS Qualification* – states direct butt joints are qualified for direct butt joints in figures 3.1, 3.2, and 3.5(D) only. The Contractor's welding procedure would have had to be qualified using an indirect butt joint (type 3.3 (A&B), 3.4. and 3.5(E)) to weld the type of lap splice called for in the NCR. Since the welding procedure used was not qualified for indirect butt joints, this also made the welder not qualified to make the weld. The Contractor wrote NCR 24590-WTP-NCR-CON-03-085 to document this splice weld error. During the Contractor's review for any other splice welds like described above, the Contractor determined

they had welded reinforcement in wall placement LAW-0044 using the same type of joint configuration. The Contractor issued NCR 24590-WTP-NCR-CON-03-086 to address the second splice weld.

Failure to perform the splice weld, an activity affecting quality, in accordance with an approved welding procedure and a qualified welder is a Finding against QAM Policy Q-05.1, Section 3.1.1 for failure have and perform quality affecting activities in accordance with approved procedures (Finding A-03-AMWTP-RPPWTP-001-F03).

Concrete Placements

For the placements listed in Section 1.5.1 above, the inspectors observed field engineering staff performing concrete receipt activities and observed their review of the batch tickets, as required by Section 3.11.2 of *Concrete Operations (Including Supply)*. The inspectors observed field engineer occasionally directing the Material Testing Subcontractor to perform additional testing of the delivered concrete to ensure conformance with specification requirements. The inspectors concluded these activities were performed in accordance with established requirements.

The inspectors observed the Materials Testing Subcontractor field technicians performing concrete receipt activities, observed the review of batch tickets, and observed recording of information required by Section 3.2.1 of the *Engineering Specification for Material Testing Services*. The inspectors concluded these activities and documents were performed or completed in accordance with the specification.

The inspectors examined the conduct of testing for concrete temperature, slump, and unit weight, and observed filling and capping the 6-inch by 12-inch compressive test cylinders, and the field storage of the test cylinders for the placements identified above. The inspectors concluded the Material Testing Subcontractor technicians were performing these testing activities in accordance with their procedures, the applicable ASTM standards, and Contractor's specifications.

The inspectors witnessed the placement of concrete, for the placements listed above, and concluded the concrete was being produced, placed, consolidated, and tested in accordance with procedures, specifications, and required codes and standards. The inspectors concluded the Contractor was conforming with the maximum 24 inch lift height, as required by Section 3.7.4 of *Engineering Specification for Concrete Work*. The inspectors observed the vertical foot per hour maximum placement rates (3-4 feet as applicable), established by the panel manufacturer, was being maintained. Wall placements were being performed using cut-away tremie systems, which ensured concrete was being placed in a controlled manner. The process also ensured the concrete did not exceed the maximum free fall distance, as outlined in Section 3.7.1 of *Engineering Specification for Concrete Work*.

The inspectors examined the above listed Concrete Pour Cards and concluded the required signatures were in place prior to the start of the placements.

The inspectors observed adequate revibration efforts on the above placements after completion of the final lifts and before the concrete has reached its initial set.

1.6.3 Conclusions

The inspectors concluded the following:

- Concrete testing was performed in accordance with the technical specifications, procedures, and applicable ASTM requirements.
- Reinforcement steel installations listed above and other attributes associated with the concrete placements for the LAW, HLW, and PTF were normally performed in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing QC activities for this work, and QC activities were documented as required by procedures. One Finding was against QAM Policy Q-05.1, Section 3.1.1 was identified for failure to follow procedures regarding installing unspecified out-of-plain, non-contact, splices in the PTF pit walls, south tunnel (A-03-AMWTP-RPPWTP-001-F02).
- The Contractor did not have a qualified welding procedure or a qualified welder to make the indirect butt splices in an LAW interior wall. This was a Finding against QAM Policy Q-05.1, Section 3.1.1 for failure to have and follow procedures (A-03-AMWTP-RPPWTP-001-F03).

1.7 Adequacy of Fire Protection Piping System Work Activities (Inspection Technical Procedure [ITP] I-138)

1.7.1 Inspection Scope

The SRD, Volume II, Section 4.5, *Fire Protection*, safety criterion required the Contractor to conform with National Fire Protection Association (NFPA) 801, *Standard for Facilities Handling Radioactive Materials*, 1995 Edition. NFPA 801 required conformance with several other NFPA standards, including the 1992 addition of the NFPA-24, *Standard for the Installation of Private Fire Service Mains and their Appurtenances*.

The inspectors examined six hydrostatic test packages for conformance with requirements specified in SRD Safety Criteria specified in Volume II, Section 4.5 and observed the conduct of hydrostatic testing on six fire protection piping segments to determine whether the testing conformed to the requirements.

1.7.2 Observations and Assessments

In preparation for inspecting firewater testing activities, the inspectors examined the following documents governing the installation, flushing and cleaning, and hydrostatic testing of the Fire Service Water System:

- 24590-BOF-C2-C12T-00021, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan – Area 21*, Revision 2, dated September 10, 2002

- 24590-BOF-C2-C12T-00022, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan – Area 22*, Revision 2, dated September 9, 2002
- 24590-BOF-C2-C12T-00023, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan – Area 23*, Revision 3, dated September 9, 2002
- 24590-BOF-C2-C12T-00027, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan - Area 27*, Revision 3, dated September 9, 2002
- 24590-BOF-C2-C12T-00029, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan - Area 29*, Revision 2, dated September 9, 2002
- 24590-BOF-C2-C12T-00030, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan - Area 30*, Revision 3, dated April 23, 2003
- 24590-BOF-C2-C12T-00031, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan - Area 31*, Revision 4, dated March 6, 2003.

The inspectors examined test packages 24590-WTP-PTR-P-03-0045, Revision 0, BOF Area 29, 30, and 31; 24590-WTP-PTR-P-03-0047, Revision 0, BOF Area 27; 24590-WTP-PTR-P-03-0048, Revision 0, BOF Area 27; 24590-WTP-PTR-P-03-0050, Revision 0, BOF Area 23; 24590-WTP-PTR-P-03-0051, Revision 0, BOF Area 21 & 22; and 24590-WTP-PTR-P-03-0054, Revision 0, BOF Area 23. The inspectors verified the proper test boundaries were specified, valve line-ups were thorough, and the required test parameters had been specified. The inspectors verified the calibration of the pressure gauge was current, the appropriate calibration stickers were affixed, and the gauge range conformed to the requirements established by NFPA, *Standard for the Installation of Private Fire Service Mains and their Appurtenance*.

The inspectors observed the conduct of hydrostatic testing on a portion of the fire service water piping in Area 21, 22, 23, 27, 29, 30, and 31 and verified the hydrostatic testing had been conducted in accordance with the Contractor's established requirements and NFPA 24, and the system tests conformed to established requirements regarding leakage and time at pressure.

1.7.3 Conclusions

The inspectors concluded the Contractor had accomplished hydrostatic testing of fire service water piping systems in accordance with established requirements.

1.8 Adequacy of Installation of Plant Wash and Disposal Tanks (PWD-VSL-00045 and PWD-VSL-00046) (ITP I-120 and 121)

1.8.1 Inspection Scope

The inspectors witnessed the Contractor's work activities governing the installation of the PTF Plant Wash and Disposal Tanks anchor bolts and liner plates as required by design drawings, Codes, and SRD Volume II, Safety Criterion 4.2-2.

1.8.2 Observations and Assessments

The inspectors witnessed the installation of the PWD-VSL-00045 and PWD-VSL-00046 tanks anchor bolts and stainless steel liner plates in the firewater pit at the pretreatment building. The inspectors verified the material used for installation and welding the anchor bolts and stainless liners to the embeds were acceptable in accordance with drawing 24590-PTF-DD-S13T-00016, *Pretreatment Facility Structural Concrete Embedments Pit Details SH1*, Revision 6, dated February 26, 2003, and Field Change Request 24590-WTP-FCR-C-03-059, Revision 0. The inspectors verified the welders, welding electrodes, and final weldments, which were dissimilar metal welds, were acceptable in accordance with the drawing stated above, ASME Section IX, 1995 Edition, and AWS D1.6-99 codes. The inspectors verified documentation for fieldwork packages PTF-M-S-0001 and PTF-M-S-0002 were acceptably completed. The inspectors witnessed the acceptable alignment of the PWD tanks over the welded anchor bolts.

1.8.3 Conclusions

The inspectors concluded the Contractor acceptably installed the anchor bolts and stainless steel liner plates for the PWD tanks in accordance with the requirements of the design drawing, ASME Section IX, and AWS D1.6 code.

1.9 Adequacy of BOP Construction Activities (ORP M 414.1-4)

1.9.1 Inspection Scope

The inspectors reviewed selected BOP construction activities to determine if the Contractor was performing these activities in accordance with the QAM, and approved design, technical specifications, construction procedures, work packages, and other related documents.

1.9.2 Observations and Assessments

Pretreatment Facility Conduit Installation

The inspectors examined the 1" rigid steel conduits installed for lighting circuits associated with work package PTF-E-L-0001, prior to concrete placements at the PTF. In preparation for the examination, the inspectors reviewed the following documents governing the installation:

- 24590-PTF-FSK-CON-E-03-007, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 1, dated April 8, 2003
- 24590-PTF-FSK-CON-E-03-010, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 0, dated March 19, 2003
- 24590-PTF-FSK-CON-E-03-006, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 0, dated March 17, 2003
- 24590-PTF-FSK-CON-E-03-010, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 1, dated March 19, 2003
- 24590-PTF-FSK-CON-E-03-010, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 0, dated March 19, 2003
- 24590-PTF-FSK-CON-E-03-010, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 1, dated May 13, 2003
- 24590-PTF-FSK-CON-E-03-010, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 1, dated May 13, 2003.

The lighting drawings showed all exposed conduit runs. Design Change Notice (DCN) 24590-WTP-E0N-E13T-00001 allowed embedding of unscheduled conduits, such as lighting. The Contractor redlined the above field sketch drawings for actual configuration of the conduit runs and the Contractor will generate a field change notice to incorporate the final location of embedded conduits.

The inspectors concluded the Contractor's installation conformed to the above documents, redlined field sketches, and the 2002 National Electrical Code (NEC).

Pretreatment Facility Grounding Installation

The inspectors examined the grounding cables, splices, and grounding configuration prior to concrete placement at the Pretreatment Facility, associated with work package PTF-E-G-0001. In preparation for the examination, the inspectors reviewed the following documents governing the installation and inspection of the grounding cable layout:

- 24590-WTP-GPP-CON-3308, *Grounding Procedure*, Revision 0, dated April 25, 2002
- 24590-PTF-E22-GRE-00006, *Pretreatment Facility Grounding Layout EL. 0'0" Area 4*, Revision 1, dated August 29, 2002
- 24590-PTF-E22-GRE-00008, *Pretreatment Facility Grounding Layout EL. 0'0" Area 6*, Revision 1, dated November 15, 2002

- 24590-PTF-E22-GRE-00005, *Pretreatment Facility Grounding Layout EL. 0'0" Area 3*, Revision 2, dated November 15, 2002.

The inspectors concluded the Contractor's grounding cable installation conformed to the documents described above and to the 2002 NEC.

Grant Construction - Assured Grounding Program

The inspectors discussed with the Grant sub-contractor compliance to the assured grounding program implemented, by the Contractor, as specified by 29 CFR 1926.404(b)(1) and the 2002 NEC Article 527.6.

The sub-contractor was aware of the ground-fault circuit interrupter (GFCI) protection requirement on all 120-volt, single-phase 15-, 20-, and 30-ampere receptacle outlets on construction sites, used by employees, but was not aware that the extension cords also required either GFCI protection or tested to an assured grounding program.

Temporary power, supplied from a 45 KVA Generator (Y8546) was used by employees for power tools and the generator also supplied power to the sub-contractor's construction trailer. A caution tag had been installed on the 50-amp plug, stating the two GFCI receptacles mounted on this generator were bad. The sub-contractor had extension cords plugged into these receptacles with portable GFCI's installed at the female end of the extension cords.

The inspectors verified the GFCI receptacles were bad and discussed with the sub-contractor the requirement of either GFCI protection or the assured grounding program for the extension cords. The sub-contractor subsequently relocated the portable GFCI's ahead of the extension cords. The following day the bad GFCI receptacles were replaced at the generator. This resolves this issue.

The sub-contractor was also unaware of the assured grounding testing requirements on all other temporary cords and had not performed the assured grounding tests on the 240-volt cord feeding the site construction trailer.

The inspectors discussed this issue with the sub-contractor and they in turn notified the electrical contractor, who performed the required tests. This resolves this issue.

The inspectors also discussed the grounding requirement of 2002 NEC, Article 550.16, 550.32 and 250.32, which requiring a grounding electrode (ground rods) for each building or structure. The sub-contractor had not installed ground rods at the construction trailer. The inspectors discussed this NEC noncompliance with the sub-contractor and the sub-contractor subsequently installed two ground rods meeting the above requirements. This resolves this issue.

Substation #8

The inspectors examined substation #8, 1500 KVA transformer and 480-volt switchgear (2000 amp main), located southeast of the LAW Building, as specified by *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1 dated January 28, 2003, to

determine conformance with the 2002 NEC. The inspectors notified the Contractor's electrical field engineer of the following electrical code deficiencies:

- NEC-2002, Article 250.32(B)(1) requires, where two or more buildings or structures are supplied from a common ac service by a feeder, the equipment-grounding conductor run with the supply conductors shall be connected to the building or structure disconnecting means and to the grounding electrode. The equipment-grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded.

The Contractor had not bonded the equipment-grounding conductor, run with the 13.8 KV conductors, to the transformer enclosure, as required above.

The inspectors discussed this NEC noncompliance with the electrical field engineer and the Contractor is reviewing the grounding detail for this transformer. This item, typical for all substations, will be tracked as follow-up item (A-03-AMWTP-RPPWTP-001-A04).

- NEC-2002, Article 250.30(A)(1) Exception No. 1, grounding of separately derived systems, states "A bonding jumper at both the source and the first disconnecting means shall be permitted where doing so does not establish a parallel path for the grounded circuit conductor."

The Contractor installed a bonding jumper at both the transformer "XO bushing" and at the first disconnecting means, with the grounding electrode conductor installed at the first disconnecting means, thus creating a parallel path for the grounded circuit conductor.

The inspector discussed this deficiency with the Contractor, who in turn is discussing the interpretation of the grounding requirements of a separately derived system with their electrical experts. The Contractor did not agree with the interpretation of the inspectors for grounding/bonding requirements for the 13.8 KV-480/277-volt transformer. A call was made to the National Fire Protection Association, Inc. (NFPA) for an interpretation. NFPA confirmed this installation did create a parallel path for the grounded conductor. This item, typical for all substations, will also be tracked as follow-up item (A-03-AMWTP-RPPWTP-001-A04).

- NEC-2002, Article 215.10 requires each feeder disconnect rated 1000 amperes or more and installed on solidly grounded wye electrical systems of more than 150 volts to ground, but not exceeding 600 volts phase-to-phase, be provided with ground-fault protection of equipment in accordance with the provisions of 230.95.

NEC-2002, Article 230.95(C) requires the ground-fault protection system be performance tested when first installed on site. The test shall be conducted in accordance with instructions that shall be provided with the equipment. A written record of this test shall be made and shall be available to the authority having jurisdiction.

The Contractor had not performed the ground-fault performance test on substation #8, nor had they performed the ground-fault performance test on any of the other substations, prior to putting them into service, as required above.

The inspectors discussed the above NEC noncompliance with the Contractor's electrical field engineer and the Contractor subsequently contacted General Electric to perform ground-fault performance testing. With two exceptions the ground-fault protection (GFP) test was successfully completed the first time. Substation 2 had a bad power trip unit and, therefore, would not trip when the ground-fault was simulated. The power trip unit was replaced and Substation 2 was re-tested and approved. Substation 12 required over 500 amps to get the GFP system to trip, which was approximately 25% above the requirement. After removing the back cover the inspectors noted the equipment grounding conductors were ty-wrapped to the neutral bus thus creating a current path that bypassed the neutral current transformer. After the ty-wrap was removed, the test was re-performed satisfactorily. This resolves this issue. The inspectors witnessed the ground-fault performance test on the substations listed below:

Substation 2 (2000 amp main)	Substation 4 (1000 amp main)
Substation 7 (1000 amp main)	Substation 9 (2500 amp main)
Substation 12 (2000 amp main)	Substation 13 (1200 amp main)
Substation 15 (1200 amp main)	Substation 16 (1000 amp main)

Ice Trailer

The inspectors examined temporary HLW Connex # JO-55-071, located in the HLW building (southwest side), as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-02-017. The following electrical equipment installed for the Ice Trailer was examined: 1) 60 amp disconnect (fused 40 amps); 2) 250-volt, 50 amp receptacle and cord connector; and 3) the control panel located on the Ice Trailer.

The following NEC noncompliance issues were identified and discussed with the Contractor:

- NEC Article 2002, Article 240.4 requires conductors to have overcurrent protection in accordance with their ampacities specified in 310.15. Article 240.4(D) requires the overcurrent protection shall not exceed 20 amperes for 12 AWG copper conductors.

The Ice Trailer had #12 AWG conductors feeding the lights in the trailer, tapped off of the 50-amp cord feeding the compressor, which had 40 amp overcurrent protection.

The Contractor had inspected the work performed by them, consisting of the disconnect and receptacle installed for the Ice Trailer. The Contractor had not inspected the Ice Trailer panel and believed the cord was just feeding the compressor only. The inspector

discussed the noncompliance above with the Contractor, and it was agreed the #12 AWG conductors did not have the proper overcurrent protection.

The Contractor ordered the fuse block and it will be installed at a later date. This will be track as follow-up item (A-03-AMWTP-RPPWTP-001-A05).

Office Supply Storage Connex

The inspectors examined the temporary 100-amp panelboard installed for the office supply connex located north of the T-40 building, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-02-025.

The inspectors concluded the Contractor had installed the panelboard above in accordance with the 2002 NEC.

Electrical Service to T28 Building

The inspectors examined the temporary power installed for the T-28 Visiting Center, located east of the south gate security station, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-032. The following electrical equipment was examined: 1) 100 amp 480 volt disconnect; 2) 50 KVA single phase transformer; and 200 amp, 240/120 volt panelboard.

With one exception the electrical equipment described above was found to comply with the NEC requirements. The following NEC noncompliance issue was identified and discussed with the Contractor:

- NEC Article 2002, Article 110.26 requires three feet working clearance in front of the 200-amp panelboard.

A display board was installed covering the panelboard, this display board swung open 90 degrees, but this did not achieve the required three feet working clearance. The Contractor agreed this installation did not meet Article 110.26. This item was not reworked prior to the end of this inspection period and, therefore, will be tracked as follow-up item (A-03-AMWTP-RPPWTP-001-A06).

Electrical to Septic Drain Field

The inspectors examined the temporary electrical power to the septic drain field from substation # 2, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-02-068.

The inspectors concluded the Contractor had installed the above installation in accordance with the 2002 NEC.

Tool Room #5

The inspectors examined the temporary power installed for Tool Room #5, located west of T12 Facility, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-033. The following NEC noncompliance was identified and discussed with the Contractor:

- NEC Article 2002, Article 408.4 requires a circuit directory installed on the face of the panelboard identifying the purpose of each circuit.

The Contractor had not identified each circuit breaker's purpose. The Contractor subsequently installed the circuit directory. This resolves this issue.

Mask Wash Trailer T42

The inspectors examined the temporary power installed for Mask Wash Trailer T42, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-023. The following electrical equipment was examined: 1) 100 amp 480 volt disconnect; 2) 50 KVA single phase transformer; and 200 amp, 240/120 volt panelboard.

With one exception the electrical equipment described above was found to comply with the NEC requirements.

- NEC Article 2002, Article 422.31(B) requires permanently connected appliances rated over 300 volt-amperes, the branch-circuit switch or circuit breaker shall be permitted to serve as the disconnecting means where the switch or circuit breaker is within sight from the appliance or is capable of being locked in the open position.

The circuit breaker feeding the water heater was not within sight of the water heater nor was it capable of being locked in the open position.

This NEC noncompliance issue was discussed with the Contractor field engineer, who verified the lockout device for the circuit breaker had been ordered and will be installed when it arrives on site. This will be tracked as follow-up item (A-03-AMWTP-RPPWTP-001-A07).

LAW Craft Change House T-07A

The inspectors examined the temporary power installed for LAW Area Change House T-07A, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-023. The following electrical equipment was examined: 1) 200 amp 480 volt disconnect; 2) 100 KVA single phase transformer; and 3) two 200 amp, 240/120 volt panelboards.

The following NEC noncompliance issue was identified and discussed with the Contractor:

- NEC Article 200.2, Article 250.97 requires grounding bushings on raceways installed in concentric knockouts having circuits over 250-volts to ground.

Disconnect T-7A did not have a grounding bushing installed on the 1½" liquid-tight flexible metal conduit installed in a concentric knockout.

The inspector discussed this NEC noncompliance with the electrical field engineer and the Contractor subsequently installed the grounding bushing. This resolved this issue.

Power Distribution Rack PDR-001 and General Distribution Rack GDR-002

The inspectors examined power distribution rack PDR-001 and general distribution rack GDR-002 installed at sub-contractor row, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-040. The following electrical equipment was examined: 1) 225 amp 480 volt panelboard (branch circuits not installed at this time); 2) 200 amp transformer disconnect; 3) 200 amp spare disconnect (line side only); 4) 75 KVA single phase transformer; and 5) one 200 amp disconnect and two 100 amp disconnects (line side only, load side to be installed by sub-contractor).

The inspectors concluded the Contractor had installed the above installations in accordance with the 2002 NEC.

Power Distribution Rack PDR-003

The inspectors examined the power distribution rack PDR-003 located in the southeast corner of the HLW, as specified in *Control of Temporary Electrical Installations*, 24590-WTP-GPP-CON-3311, Revision 1, dated January 28, 2003, for conformance with the 2002 NEC.

To perform this inspection the inspectors reviewed the Contractor's Temporary Power Request Form Number 24590-WTP-EIP-CON-03-040. The following electrical equipment was examined: 1) 400 amp 480 volt non-fused disconnect; 2) 225 amp 480 volt panelboard (branch circuits 6, 8 & 14, 16 only); 3) 12" X 12" junction box and receptacle drops; 4) three 200 amp spare disconnects (line side only); and 5) 100 amp PDU-JO-53-046 disconnect (fused 60 amp).

The inspectors concluded the Contractor had installed the above installation in accordance with the 2002 NEC.

Hydrostatic Pressure Testing of PVC Potable Water Piping

The inspectors examined hydrostatic test package 24590-WTP-PTR-P-03-0053, Revision 0, Balance-of-Facility (BOF) Area 24, 25, 29, and 30, and observed the conduct of hydrostatic testing on one PVC Potable Water Piping segments to determine whether the testing conformed to the documents described below:

The inspectors examined the following documents governing the installation and testing of the PVC Potable Water System:

- 24590-BOF-3PS-PX12-T0001, *Engineering Specification For PVC Potable Water Piping Installation*, Revision 3, dated December 5, 2002
- 24590-BOF-M6-DOW-00001, *Domestic Water System Domestic Water Distribution*, Revision 2, dated March 27, 2003.

The inspectors verified proper test boundaries were specified, valve line-ups were thorough, and the required test parameters had been specified. The test packages contained the requirements of the above listed specifications and referenced codes. The inspectors verified the calibration of the pressure gauge was current and the appropriate calibration sticker was affixed.

The inspectors observed the conduct of hydrostatic testing on a portion of the potable water piping in areas 24, 25, 29, and 30, and verified the hydrostatic testing had been conducted in accordance with the Contractor's established requirements and AWWA C605 (94), *Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water*, dated July 1, 1995. The system tests conformed to established requirements regarding leakage and time at pressure and the test packages were completed as required.

T41-Mechanics Shop

The inspectors performed in process inspections of the Mechanics Shop slab rebar and embedded item installations (north center) and (south center) on grade to elevation 649'-3". The inspectors determined rebar size (placement Pour Cards T41-S4 and T41-S5), lap length (spot check), and

embed type, size, and location were in accordance with the drawings and specifications listed below.

- 24590-WTP-3PS-D000-T0001, *Engineering Specification For Concrete Work*, Revision 3, dated February 10, 2003
- 24590-BOF-3PS-C000-T0001, *Engineering Specification For Material Testing Services*, Revision 2, dated July 12, 2002
- 24590-WTP-FSK-CON-T-02-011, *Temporary Building Mechanics Shop Slab Plan and Foundation*. Revision 1, dated October 15, 2002
- 24590-WTP-FSK-CON-T-02-015, *Temporary Building Mechanics Shop East & West Elevations and Sections and Details*, Revision 0, dated October 15, 2002.

Building 87 (Switchgear Building)

The inspectors performed in process inspection of the South Grade Beam of Building 87 (Switchgear Building). The inspectors determined rebar size, (placement Pour Card 24590-BOF-DBR-CON-03-C120) lap length (spot check), and anchor bolt type; size, and location were in accordance with the drawings and specifications listed below.

- 24590-WTP-3PS-D000-T0001, *Engineering Specification For Concrete Work*, Revision 3, dated February 10, 2003
- 24590-BOF-3PS-C000-T0001, *Engineering Specification For Material Testing Services*, Revision 2, dated July 12, 2002
- 24590-BOF-DB-S13T-00001, *Switchgear Building Foundation & Slab Plans At El 0'-0" And El (-) 9'-0"*, Revision 2, dated May 8, 2003
- 24590-BOF-DB-S13T-00003, *Switchgear Building Foundation Vault Reinforcing Details*, Revision 1, dated December 17, 2002
- 24590-BOF-DB-S13T-00004, *Switchgear Building Foundation – Grade Beams And Slab Reinforcing Details*, Revision 0, dated December 17, 2002.

The inspectors observed the Materials Testing Subcontractor field technicians performing concrete receipt activities, observed the review of batch tickets, and observed recording of information required by Section 3.2.1 of the *Engineering Specification for Material Testing Services*. The inspectors concluded these activities were performed in accordance with the specification.

The inspectors examined the conduct of testing for concrete temperature, slump, and unit weight, and observed filling and capping the 6-inch by 12-inch compressive test cylinders, and the field storage of the test cylinders for the placement listed above. The inspectors concluded Material

Testing Subcontractor technicians were performing these testing activities in accordance with their procedures, the applicable ASTM standards, and Contractor's specifications.

The inspectors witnessed the placement of concrete, for the placement described above, and concluded the concrete was being produced, placed, consolidated, and tested in accordance with procedures, specifications, and required codes and standards. The inspectors concluded the Contractor was conforming to the maximum 24-inch lift height, as required by Section 3.7.4 of *Engineering Specification for Concrete Work*. Placements were being performed using the concrete pump hose, which ensured concrete was being placed in a controlled manner. The process also ensured the concrete did not exceed the maximum free fall distance, as outlined in Section 3.7.1 of *Engineering Specification for Concrete Work*.

Installation of Electrical Duct Banks

The inspectors witnessed the installation of the electrical duct banks, reinforcement, and concrete placement at the west end of the switchgear building 87. The inspectors verified the conduit material and size was acceptable in accordance with drawing 24590-BOF-E0-E54T-00016, *Electrical Duct Bank System Site Plan – Area 5*, Revision 0, dated April 3, 2003. The inspectors verified the reinforcement around the electrical conduits were acceptable in accordance with drawing 24590-BOF-CO-50-00010, *Non-ITS Duck Bank Sections and Details*, Revision 2, dated July 18, 2002. The inspectors witnessed the concrete placement and observed the Contractor placing, consolidating, and color-coding the top of the concrete acceptable in accordance with the Contractor's concrete procedure. The inspectors concluded the conduit, reinforcement, and concrete were acceptable in accordance with the design requirements.

Installation of Chilled Water, Cooling Water Pipelines

The inspectors reviewed the pipe material and witnessed the installation of the 48-inch Cooling Water system. The inspectors verified the markings on the pipe/fittings material were acceptable in accordance with the Contractor's specification 24590-BOF-3PI-CY01-00001, *Installation of Cooling Water, Chilled Water Ductile Iron Pipelines*, Revision 0, dated February 19, 2003, and 24590-WTP-3PB-P000-TH20A, *Piping Material Classification – Pipe Class H20A*, Revision 0, dated January 29, 2003. The inspectors concluded the piping/fittings were acceptable in accordance with the Contractor's specifications. The inspectors witnessed the installation of cooling water line south of the LAW building. The Contractor was using the manufacture's instructions for installing a restrained joint ductile iron pipe assemblies system. The inspectors concluded the Contractor was installing the cooling water system acceptable in accordance with the manufacture's instructions and drawing 24590-BOF-CO-PCW-00012, *Plant Cooling Water Plan C1 and C2 Profile for C1 – Sta 0+00 to Sta 1+59.7*, Revision 0, dated March, 11, 2003.

Plant Wash and Disposal System Hydro Testing PTF Building

The inspectors examined testing on sections of the PT Facility Basemat drain piping to determine whether the testing was performed in accordance with the requirements of 24590-WTP-3PS-PS02-T0003, *Engineering Specification for Field Fabrication and Installation of Piping*, Revision 0, dated June 17, 2002.

The inspectors witnessed hydro tests 24590-WTP-PTR-P-03-0003 and 24590-WTP-PTR-P-03-0004. The hydro tests were required to be a 10-foot static head of water to be held for 15 minutes with no drop in the water level. The inspectors examined leak testing performed on PT Basemat drainpipe spools for the C2 and C3 systems. There was no drop in water level during the fifteen-minute test. The inspectors reviewed the pressure test documentation and found Contractor personnel using a different form for test 24590-WTP-PTF-P-03-0004 than the one approved in procedure 24590-WTP-GPP-CON-3504, *Pressure Testing*, Revision 0, dated October 12, 2003. The inspectors pointed this out to the Contractor and Contractor responded by filling out the approved pressure test documentation. The inspectors concluded the Contractor conducted the pressure test acceptable in accordance with the approved procedures.

Cooling Tower Subgrade

The inspectors verified subgrade for the cooling tower was proof rolled and the top (12) inches was compacted and tested in accordance with the requirements of 24590-BOF-3PS-CE01-T0001, *Engineering Specification for Excavation and Backfill*, Revision 4, dated March 7, 2003.

The inspectors reviewed In Place Density & Moisture Test Reports from the Contractor and verified acceptable density and moisture test results were performed and documented per the below listed specifications.

- 24590-BOF-3PS-CE01-T0001, *Engineering Specification for Excavation and Backfill*, Revision 4, dated March 7, 2003
- 24590-BOF-P1-83-00001, *Cooling Tower General Arrangement Plan and Sections*, Revision 0, dated July 10, 2002.

1.9.3 Conclusions

The inspectors concluded the following:

- PTF conduit installations and grounding installations conformed to governing installation requirements including the 2002 NEC.
- After some minor corrections, subcontractor's (Grant Construction) assured grounding program met 29 CFR 1926.404(b)(1) requirements.
- Substation # 8, 1500 KVA Transformer and 480-volt switchgear, located southeast of the LAW building, did not comply with grounding requirements of NEC-2002, Article 250.32(B)(1). Corrective actions to address this issue are being tracked as Assessment Follow-up Item A-03-AMWTP-001-A04.
- After inspectors notified the Contractor of NEC Article 215.10 requirements to test the Ground Fault Protection system of substations after installation, testing was completed and deficiencies were corrected.

- Ice Trailer overcurrent protection did not meet NEC Article 240.4 requirements, the Contractor order the proper overcurrent protection and plans to install the devise once it arrives. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A05.
- The Office Supply Storage Connex, Law Craft Change House, the Septic Drain Field, Power Distribution Rack PDR-001, and General Distribution Rack GDR-002 electrical installations were in accordance the 2002 NEC.
- Electrical service to the T28 building did not comply with NEC Article 2002, Article 110.26 because the display board covering the panelboard did not allow the three feet working clearance requirement. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A06.
- The temporary power installed for Mask Wash Trailer T42 did not comply with NEC Article 2002, Article 422.31(B) in that the circuit breaker feeding the water heater was not within sight of the water heater nor was it capable of being locked in the open position. The Contractor was procuring a lockout device. Corrective action to address this issue will be tracked as Assessment Follow-up Item A-03-AMWTP-001-A07.
- Rebar and embedded item placement for the north and south center slabs of building T-41 Mechanics Shop, Switchgear Building # 87 Grade Beam (south beam) and Electrical Duct Banks were installed in accordance with technical specifications, procedures, and required codes and standards.
- The concrete for the Mechanics Shop, Switchgear Building, and Electrical Duct Banks was produced, placed, and consolidated in accordance with technical specifications, procedures and required codes and standards.
- The Contractor had accomplished hydrostatic testing of PVC Potable Water Piping in accordance with established requirements.
- The installation of the 48-inch Cooling Water System was installed in accordance with specifications, procedures, and manufactures recommendations.
- The subgrade for the cooling tower was proof rolled and the top (12) inches were compacted, tested, and documented in accordance with the Contractor specification.
- The hydrostatic tests of the Plant Wash and Disposal System segments were conducted in accordance with approved procedures and met acceptance criteria.

1.10 IH&S Oversight (ITP I-162)

1.10.1 Inspection Scope

The inspections in this area focused on the implementation of the Contract industrial health and safety requirements described in ORP M 440.1-2, *Industrial Hygiene and Safety Regulatory Plan for the Waste Treatment Plant Contractor*. Specifically, the inspectors assessed compliance to the requirements of the Contractor's *Nonradiological Worker Safety and Health Plan (HSP)*, 24590-WTP-PL-IS-01-001, Revision 3, dated May 6, 2003, for the River Protection Project Waste Treatment and Immobilization Plant, which had been reviewed and approved by the ORP, along with applicable requirements specified in ORP M 440.1.2. Areas reviewed included Contractor oversight of subcontractor safety and health programs; lock and tag activities; hoisting and rigging activities; and site-wide hazards identification, recognition and control.

1.10.2 Observations and Assessments

Link Belt Model LS 278 in Luffing Configuration

See Section 1.11. 6 below for a discussion of the Occurrence Report associated with the Link Belt Model 278 Luffing crane incident.

The inspectors observed the assembling and erecting of the LS 278 mobile crane with luffing configuration. The inspectors observed the boom, jib and mast sections being assembled and verified the centerline level of the crane during the assembly. The inspectors observed the placement of the limit switches for boom and jib angles.

The Contractor assembled the luffing configuration under a crane maintenance and service Job Hazards Analyses (JHA). The inspector noted a separate JHA for installing luffing equipment was not written. However, after reading the maintenance and service JHA the inspector determined that anticipated risks were identified for the luffing operation. The inspectors reviewed each step of the JHA for the application of set up of the LS 278 mobile crane in luffing configuration and determined that the crane maintenance JHA dated February 3, 2003, included all of the credible risks associated with that work and determined that no extraneous or inappropriate risks were called out in the document. The inspectors determined the crane maintenance JHA (although not specified for this task) was applicable and compliant for the luffing assembly work.

The inspectors determined the Contractor's foreman for the luffing assembly verbally discussed all elements with every member of the workforce on a weekly basis. The inspectors attended the weekly briefing.

The inspectors observed the workers setting limit switches on the luffing jib and main boom. The inspectors also questioned the vendor representative regarding the setting values, specifically the luffing jib settings. 245590-WTP-RPT-CON-02-087, Rev 0, *Root Cause Analysis for Damage Incurred by Boom Butt Section of LS-278 Crawler in the Luffing Configuration*, dated 12 August, 2002, specified the angular limits on the luffing jib would be

provided with two limit switches. One switch would be set at the minimum operating radius from the main boom (factory recommended) of 75 degrees and the other limit switch (Contractor recommended) would be placed and operate at between 71-72 degrees.

During the assembly, the factory representative informed the inspectors both switches were installed, but were operating almost simultaneously. The simultaneous action was not in conformance with the intent of the investigation team's above referenced root cause report, i.e. provide adequate warning to the operator with a back up switch. The inspectors discussed this assembly issue with the Contractor's foreman and he assured the inspectors the switches would be installed and operated as required.

During pre-operations, the inspectors witnessed that the luffing jib switches (one mechanical and one electronic) both disabled the crane (jib) hoist at the designated angles and both operated independently. The inspectors also witnessed the main boom switches disabled the hoist at the designated angles. Based on this testing, the inspectors were satisfied the intent of the root cause report was met regarding providing adequate warning to the operator with a back up switch, as discussed above.

The inspectors observed the LS 278 luffing crane functional load test. The load test conformed to the requirements of 24590-WTP-RIG-CON-03-095, *Rigging Package – Heavy/Critical Lift Category Functional and Load Test of LS-278 Luffer JO-14-021*, dated May 28, 2003.

The inspectors verified the qualifications, testing, and certifications of the designated operator for the crane and determined the necessary documents were in place and conformed to the Contractor's procedures.

Potain Tower Crane Elevator Installation

The inspectors observed the erection of the PTF tower crane elevator. The crew was required to work on the outside of the Tower Crane boom lattice and hang the supports for the rack and pinion elevator. They originally were to work out of a man basket lifted by a Link Belt Model LS 248 crane. However, because of high wind conditions, they were switched to work off of a JLG man-lift. Both the JLG and the crane man basket were used in accordance with approved Contractor procedures. However, the JLG procedure did not detail how to safely operate and control the unit. The Contractor stated operations and control was covered in a worker-training course. Two times during the course of hanging the braces, the Foreman was involved in successfully developing and implementing on the spot changes in hazard recognition and control. Once, the crew was required to tie off and stabilize an elevator brace on the JLG prior to ascent, and another time when the worker was required to reposition the counterweight swing radius guard on the JLG.

The inspectors held a meeting with Contractor management and the elevator vendor representative from Intervect. The discussion concerned the status of controls of those allowed upon the car while assembly was underway and the training and oversight the Contractor workers were receiving from the vendor representative. Only selected craft were necessary to assemble and operate the car and hangers, and those craft had been trained and supervised by the vendor representative. Further, the vendor provided a rated tie off point for personnel who were

required for torque testing on the rail and lubrication. The inspectors inspected the entire assembly including all fittings and safety devices and lock and rode the unit in the company of the vendor representative. The inspectors determined the unit was assembled in accordance with the design documents provided by the vendor.

The Contractor will be required to load test the devices and remodel the upper landing decks on all elevators to meet the requirements of 29 CFR 1926.552 for safe access and egress. An elevator contractor who met the requirements of the Washington State Department of Labor and Industries under newly enacted legislation RCW 70.87.230, dated and enacted April 22, 2003, dealing with conveyances other than those used for the public and used in industry, will be placed on inspection contract to provide periodic inspections of the elevator. Further, the vendor representative, who qualifies under the above Washington State statute, signed off on an acceptance checklist given to the Contractor certifying completion of all required start-up items.

Hazards Identification, Recognition, and Control Program Review

The inspectors conducted a series of interviews with various superintendents, foremen, and workers regarding job hazard identification and control. The inspectors interviewed a representative number of site personnel (superintendents, foremen, and workers) and reviewed a representative sample Job Hazards Analysis (JHA's) while they were in use.

In addition, several meetings were held between the inspectors and the Contractor regarding the JHA/Safety Task Analyses Risk Reduction Talk (STARRT) Card procedure re-write. The meetings were held with both local Contractor staff and the Contractor's corporate representative, all at their request. The Contractor issued a procedure 24590-WTP-GPP-SIND-002_2, *Job Hazard Analysis (JHA) /Safety Task Analysis Risk Reduction Talk (STARRT)*, Revision 2, with an effective date of May 27, 2003.

The inspectors reviewed JHA's and interviewed personnel (Superintendents, foreman, and workers) while watching work activities underway on site. While the inspectors found the workers working safely, they also found problems with JHA implementation. Although the majority of the JHA's were satisfactory, problems were found with;

- Unsigned and undated JHA's
- JHA's in use without review/approval by Safety
- Old versions of JHA's in use
- JHA sign-in sheets without a JHA number
- Use of inappropriate JHA's.

These problems validate the issues identified during a BNI self-assessment of JHA's. The inspector attended the training on the new JHA procedure and found these problems were adequately addressed in the new procedure. The inspector will follow up with continued surveillances of JHA usage to evaluate the effectiveness of the new JHA procedure to correct the identified problems.

1.10.3 Conclusions

- Corrective actions to address the Link Belt Model LS 278 crane luffing incident were adequately implemented and the crane was configured for luffing operations and successfully tested and placed in service.
The Potain Tower Crane elevators were being installed and tested in accordance with manufacture's instructions.
- Although the majority of the JHA's reviewed were satisfactory, problems were found with unsigned and undated JHA's, JHA's in use without review/approval by Safety, old versions of JHA's in use, JHA sign in sheets found without JHA numbers, and some examples of inappropriate JHA use. The Contractor revised the JHA procedure to address these issues.

1.11 Review of Assessment Follow-up Items (Inspection Administrative Procedures (IAP) A-105 and A-106)

The following Findings, Follow-up Items, and Occurrence Reports were reviewed to determine if they could be closed. The inspectors reviewed the Contractor's description of the items, the corrective actions, and other information provided. The inspectors verified by records and, if applicable, hardware reviews, the corrective actions stated were appropriately completed.

1.11.1 (Open A-03-OSR-RPPWTP-006-A02) Follow-up on Contractor efforts to resolve OSHA concerns associated with the Potain Tower Crane. Several OSHA related concerns were raised and documented in inspection report A-03-OSR-RPPWTP-006 regarding the configuration of the Potain Tower Cranes. The following is a status of these issues:

1. Ladderways in the non-transition zone have been repaired and conform to requirements. Ladderways in transition zone have been repaired but did not conform to requirements of ASME B30.3. The Contractor is preparing a request for a variance to the DOE.
2. Welding issues for the jib chord required welding specifications from the vendor for evaluation and inspection by a competent/authorized person. This issue is closed (see below).
3. Footwalk conformance with the requirements of ASME B30.3 was included in inspection report A-03-OSR-RPPWTP-010. During this inspection cycle, the inspectors requested necessary closure documentation from Contractor management. This documentation was still not available. This issue remains as an open item.
4. The Contractor was to have requested the vendor to provide material specifications in order for the Contractor to provide an engineering analysis of the footwalk conformance to ASME 30.3. Vendor data had yet to be submitted to the Contractor for their technical evaluation.

Regarding item 2 above, the Contractor received from the vendor the weld design and acceptance criteria for the welds on the jib lattice that did not appear to be completely filled. The inspectors reviewed the design documents and acceptance criteria and determined the welds on the jib lattice were acceptable. Based on the above, this sub-item is closed.

The remaining issues must be resolved before this item can be completely closed.

1.11.2 (Closed A-03-OSR-RPPWTP-008-F01) Failure to perform the required supplier quality inspections of CB&I offsite facilities. The Contractor provided its response to the Finding on April 2, 2003, by letter CCN: 055225 and documented the discrepancy by Corrective Action Report 24590-WTP-CAR-QA-03-024 on January 30, 2003.

The inspectors verified the Contractor's Supplier Quality Organization performed the required surveillance on February 4, 2003, and issued Surveillance Inspection Report 24590-QL-YQA-MTF5-10001 as indicated in the above response.

Based on the above, this item is closed.

1.11.3 (Open Finding (A-03-OSR-RPPWTP-008-F03)) Failure to include welding verification documents for the shear studs used in fabrication of door liners HDH-LINER-00043 and HEH-LINER-00046. The Contractor provided its response to the Finding on April 22, 2003, by letter CCN-055225 and documented the discrepancy by Corrective Action Reports (CAR) 24590-WTP-CAR-QA-03-044 and 047.

After the Contractor had received and reviewed the missing shear stud welding documentation, and closed the CARs, the inspectors reviewed Material Receiving Report number MRR-04312 for door liners HDH-LINER-00043 and HEH-LINER-00046 to verify the missing Welding Documents were included. The inspectors verified Stud Test Reports for 3/4-inch studs were included in the Material Receiving Report.

The inspectors identified Stud Test Reports for 1-inch studs were not included in MRR-04312. The Contractor generated CAR # 24590-WTP-CAR-QA-03-117 documenting missing Stud Test Reports. QAM Policy Q-16.1, Section 4.3.1 required "The QA organization shall verify implementation of corrective actions taken for all reported conditions adverse to quality and close the related corrective action documentation in a timely manner when actions are complete". Failure to adequately close this weld documentation CAR is a Finding against QAM Policy Q-16.1 (Finding A-03-AMWTP-RPPWTP-001-F08).

The original Finding will remain open until the correct weld documentation is obtained and verified.

1.11.4 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-008-A04) The Contractor had not installed weatherproof covers on the receptacles mounted on the comfort stations T-9, T-8, T-12, & T-35 below panelboards.

The Contractor installed and the inspectors verified weatherproof covers were installed to meet the above requirement. This resolves this issue.

1.11.5 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-010-A02) Follow-up on the Contractor's actions to revise the Health and Safety Plan (HSP) to address Lockout/Tagout requirements (from 29 CFR 1910 to 29 CFR 1926 requirements).

The Contractor submitted revision 3 to the HSP on May 6, 2003. The new revision revised the Lockout/Tagout requirements to "...will follow a lockout/tagout procedure that incorporates applicable elements of 29 CFR 1910.147, 29 CFR 1926.417; NFPA 70E, Bechtel Standard Work Process Procedures (SWPP, System and Equipment Safety Tagging/Lockout, DOE-RL-SOD-INST-L&T.001, and Hanford Site Lockout/Tagout.)" Following issuance of this revision, the inspector's reviewed procedure 24590-WTP-GPP-SIND-008_4, *Lockout/Tagout*, dated May 27, 2003, and found it conform to the requirements within the ORP M 440.1-2. This assessment item is considered closed.

1.11.6 (Closed Occurrence Report RP-BNRP-RPPWTP-2002-0006), Damage to Linkbelt 250-Ton Luffing Crane:

A Model LS-278 Link Belt Crawler Crane in Luffing Configuration was operating at the WTP site at the LAW facility. The main boom was being raised in preparation to move to the left. However, the operator had intended to raise the luffing jib rather than the main boom. The main boom limit switch failed to disable the main boom hoist as it was being elevated. The main boom had been raised to where the main boom stops were completely compressed while the hoist drum was still engaged. This action resulted in bending the boom butt section over the boomstops, bending the chords, and crimpling the boom lacing.

The Contractor notified ORP of the occurrence and subsequently issued an occurrence report. The Contractor also prepared 24590-WTP-RPT-CON-02-087, Revision 0, dated August 12, 2002, *Root Cause Analysis for Damage Incurred by Boom Butt Section of LS-278 Crawler in the Luffing Configuration*. The root cause report concluded root causes were behavioral through the underestimation of the complexity of the task and scope, and mechanical through a defective or failed part.

As a result of the above root cause analysis, the Contractor committed to the following actions prior to the use of this crane in a luffing configuration:

- Use factory representative to provide additional technical assistance in maintenance
- Perform a daily visual inspection and documentation of limit switches and have well trained operators in the use of the load moment indicator (LMI)
- Treat any lift with main boom angle greater than 87 degrees as a medium lift
- Install an additional main boom limit switch at 87 degrees (primary disengagement) in addition to the factory installed switch set for 90.2 degrees

- Provide factory representative inspection reports noting all repairs associated with this incident have been completed
- Provide configuration specific training to the operators and oilers
- Perform operator proficiency testing
- Designate one Contractor representative (foreman) who will be responsible for crane erection
- Perform ergonomic evaluations (with necessary changes) on cab levers and devices
- Provide additional hoist drum indicators
- Install additional limit switch on luffing jib at between 71-72 degrees in addition to the factory switch set at 75 degrees (this was subsequently changed to 15.1 and 15.2 degrees respectively)
- Install a programmable hi-limit warning indicator on the luffing jib.

The above corrective actions were completed and verified by the inspectors. See Section 1.10.2 above for additional details regarding testing of the LS 278 luffing crane. Based on this effort this occurrence report is closed.

2.0 EXIT MEETING SUMMARY

The inspectors presented preliminary inspection results to members of Contractor management at an exit meeting on June 11, 2003. The Contractor acknowledged the observations and conclusions.

3.0 REPORT BACKGROUND INFORMATION

3.1 Partial List of Persons Contacted

J. Betts, Project Manager
C. Davis, Safety Assurance Manager
D. Dempster, QISI QA Manager
J. Dougherty, Site Manager
C. Edwards, Lead QC Engineer
M. Ensminger, Quality Control Supervisor
R. Grimsley, CB&I Project Welding and QA/QC Manager
T. Horst, Construction Manager
G. McClain, General Superintendent
D. Murphy PAAA Coordinator
T. Robison, CB&I Welding and QC Supervisor

J. Roth, Manager EPP
 L. Rumsey, CBI Safety Manager
 G. Shell, Quality Assurance Manager
 T. Skiba, QISI Laboratory Manager and Assistant Project Manager
 E. Smith, Safety Programs
 B. Spezialetti, Regulatory Safety Manager
 J. Steinem, Subcontract Coordinator
 R. Tosetti, Manager of Engineering
 J. Wolmutter, Construction RITS Coordinator

3.2 List of Inspection Procedures Used

Inspection Administrative Procedure I-106, " Verification of Corrective Actions"
 Inspection Technical Procedure I-112, "Geotechnical/Foundation Inspection"
 Inspection Technical Procedure I-113, "Structural Concrete Inspection"
 Inspection Technical Procedure I-120, "Nondestructive Testing Inspection"
 Inspection Technical Procedure I-121, "Piping Systems Construction Inspection"
 Inspection Technical Procedure I-138, "Inspection of Fire Protection System Inspection, Testing, and Maintenance"
 Inspection Technical Procedure I-162, "Industrial Health and Safety Inspection"
 ORP Instruction ORP M 414.1-4, "WTP Balance-of-Plant Construction Oversight Program."

3.3 List of Items Opened, Closed, and Discussed

Opened

A-03-AMWTP-RPPWTP-001-F01 Finding	Failure of CB&I to document tank fit-up inspections. (Section 1.5.2)
A-03-AMWTP-RPPWTP-001-F02 Finding	Failure to splice PTF rebar in accordance with specification or drawing (out-of-plane splice). (Section 1.6.2)
A-03-AMWTP-RPPWTP-001-F03 Finding	Failure to perform an indirect butt splice weld in accordance with a qualified procedure and a qualified welder. (Section 1.6.2)

A-03-AMWTP-RPPWTP-001-A04	Assessment Follow-up Item	Follow-up on the Contractor's actions to address substation grounding issues. (Section 1.9.2)
A-03-AMWTP-RPPWTP-001-A05	Assessment Follow-up Item	Follow-up on the Contractor's actions to address Ice Trailer wiring overcurrent protection. (Section 1.9.2)
A-03-AMWTP-RPPWTP-001-A06	Assessment Follow-up Item	Follow-up on the Contractor's actions to address panelboard clearance issues concerning electrical service to the T28 building. (Section 1.9.2)
A-03-AMWTP-RPPWTP-001-A07	Assessment Follow-up Item	Follow-up on the Contractor's actions to address mask wash trailer T42 circuit breaker issue regarding water heater. (Section 1.9.2)
A-03-AMWTP-RPPWTP-001-F08	Finding	Failure to ensure condition adverse to quality is adequately corrected (lack of adequate weld documentation for HLW shield door frame shear studs). (Section 1.11.3)

Closed

A-03-OSR-RPPWTP-008-F01	Finding	Failure to perform the required supplier quality inspection of CB&I offsite facilities. (Section 1.11.2)
A-03-OSR-RPPWTP-008-A04	Assessment Follow-up Item	The Contractor had not installed weatherproof covers on the receptacles mounted on the comfort stations T-9, T-8, T-12, & T-35 below panelboards. (Section 1.11.4)
A-03-OSR-RPPWTP-010-A02	Assessment Follow-up Item	Follow-up on the Contractor's actions to revise the Health and Safety Plan to address Lockout/Tagout requirements (from 29 CFR 1910 to 29 CFR 1926 requirements). (Section 1.11.5)
RP-BNRP-RPPWTP-2002-0006	Occurrence Report	Damage to Link Belt 250-ton Luffing Crane (Section 1.11.6)

Discussed

A-03-OSR-RPPWTP-006-A02	Assessment Follow-up Item	Follow-up on the Contractor's actions to resolve OSHA concerns associated with the Potain Tower Crane. (Section 1.11.1)
A-03-OSR-RPPWTP-008-F03	Finding	Failure to include welding verification documents for the shear studs used in fabrication of door liners HDH-LINER-00043 and HEH-LINER-00046. (Section 1.11.3)

3.4 List of Acronyms

AB	authorization basis
AMWTP	Assistant Manager Waste Treatment and Immobilization Plant
ASL	Approved Suppliers List
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Material
AWS	American Welding Society
BNI	Bechtel National, Inc.
BOF	balance-of-facilities
BOP	Balance of Plant
CAR	Corrective Action Request
CB&I	Chicago Bridge and Iron
DCN	Design Change Notice
DOE	U.S. Department of Energy
FCR	Field Change Request
GDR	General Distribution Rack
GFCI	ground fault circuit interrupter
GFP	Ground Fault Protection
HLW	High Level Waste
HSP	Nonradiological Worker Safety and Health Plan
IH&S	Industrial Health and Safety
IQECF	individual qualified equipment control procedure
ITP	Inspection Technical Procedure
ITS	important-to-safety
JHA	Job Hazards Analyses
LAW	Low Activity Waste
LMI	Load Movement Indicator
M&TE	Measuring and Test Equipment
NCR	Nonconformance Report
NDE	Non-Destructive Examination
NEC	National Electric Code
NFPA	National Fire Protection Association

NIST	National Institute of Standards and Technology
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration
PDR	Power Distribution Rack
PTF	Pretreatment Facility
PVC	Polyvinyl Chloride
PWD	Plant Wash and Disposal
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Procedures
QC	quality control
QISI	Quality Inspection Services Inc.
RCT	Radiological Control Technician
RITS	Recommendations and Issues Tracking System
SRD	Safety Requirements Document
STARRT	Safety Task Analyses Risk Reduction Talk
WPS	Welding Procedure Specification