



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

P.O. Box 450  
Richland, Washington 99352

03-OSR-0183

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

Dear Mr. Naventi:

CONTRACT NO. DE-AC-01RV14136 – INSPECTION REPORT A-03-OSR-RPPWTP-010 –  
ON-LOCATION INSPECTION REPORT FOR THE PERIOD MARCH 7 THROUGH  
APRIL 21, 2003

This letter forwards the results of the U.S. Department of Energy, Office of River Protection review of Bechtel National, Inc. (BNI) construction performance on the Waste Treatment and Immobilization Plant for the period March 7 through April 21, 2003. One Finding with four examples was identified requiring a written response (Enclosure 1). Details of the inspection are documented in the inspection report (Enclosure 2).

The vast majority of the attributes reviewed during this inspection period were found acceptable. Marked improvements were noted in electrical installations. The four examples of the Finding concerned failure to follow procedures or design drawings and included (1) an example of construction staff modifying reinforcement steel without obtaining design approval; (2) accepting a reinforcement steel placement with two rebar missing; (3) cold bending a rebar when preheating was required; and (4) failing to ensure concrete pour cards were properly filled out prior to placing concrete. Although BNI has taken actions to address concrete placement issues during the inspection period, continued management attention is warranted in this area.

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

Sincerely,

Roy J. Schepens  
Manager

OSR: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.

Title 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. 2, dated November 4, 2002 (QAM).

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

During the performance of on-location inspections for the period March 7 through April 21, 2003, the following examples of a Finding were identified:

- a. Drawing 24590-TP-DD-S13T-00009, *Civil/Structural Standards Wall Penetration Details*, Revision 4, dated March 27, 2003, Note 4, stated "Install trim rebar around openings as required by 24590-WTP-DG-S13T-00005."

Drawing 24590-WTP-DG-S13T-00005, *Civil/Structural Standards Concrete Reinforcement Details*, Revision 1, dated October 31, 2002, provided detail 4 for Reinforcement at Slab and Wall Openings.

During preparation for concrete placement number LAW-0026, the Contractor installed a 15" x 15" block-out in the east curb wall, just south of "A" line. This block-out was installed because the required 4-inch penetration was not available. Two number 9 vertical dowels protruding from the Low Activity Waste (LAW) basemat interfered with the block-out, the Contractor cut the dowels below the block-out.

Contrary to the above, the Contractor did not install the reinforcement steel in accordance with the drawings discussed above, nor obtain engineering direction prior to cutting the two number 9 vertical dowels.

This is considered a Finding against QAM Policy Q-05-1 for failure to follow drawings and procedures (A-03-OSR-RPPWTP-010-F01a). (See Section 1.3.2 of Enclosure 2 for additional details.)

- b. Specification 24590-WTP-3PS-D000-T0001, *Engineering Specification for Concrete Work*, Revision 3, dated February 10, 2003, Table 2 " Reinforcing Placement: Total number of bars shall not be less than that specified."

Contractor procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 9, 2003; paragraph 3.8.4 stated in part "Installation of reinforcing steel shall be completed in accordance with design drawings and technical specification 24590-WTP-3PS-D000-T0001, concrete work."

Contractor procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 9, 2003, Appendix 3: paragraph 1.5 item number 11 stated in part "... The Field Engineer is responsible for assuring the current issued revision at the time of the concrete pour is used and listed for the applicable documents ...."

Drawing 24590-LAW-DG-S13T-0082, *LAW Vitrification Building Main Building Wall Reinforcing Elevation Column Line "15" (Looking East)*, Revision 0, dated April 18, 2002, referenced Sections B, C, and D shown on drawing 24590-LAW-DG-S13T-00062.

Drawing 24590-LAW-DG-S13T-00062, *LAW Vitrification Building Main Building, Concrete Reinforcement Sections*, Revision 3, dated January 21, 2003, Sections B, C, and D required # 11 vertical dowels to be installed at 8 inches on center (Outside Face) only.

Contrary to the above, after the Concrete Pour Card number LAW-0009 was signed by construction, field engineering, and Quality Control, the inspectors observed two number 11 vertical dowels had not been installed as required by the above drawings.

This is considered an example of a Finding against QAM Policy Q-05-1 for failure to follow procedures (A-03-OSR-RPPWTP-010-F01b). (See Section 1.3.2 of Enclosure 2 for additional details.)

- c. Specification 24590-WTP-3PS-D000-T0001, *Engineering Specification for Concrete Work*, Revision 3, dated February 10, 2003, paragraph 3.2.7 stated in part "For bar sizes greater than # 5 bars, preheating is required prior to bending or straightening. Field bending shall be controlled and approved by field engineering."

Contrary to above, the Contractor cold bent one # 9 vertical rebar at the LAW building Zone 12, Column Line "J" without required preheating and field engineering control and approval.

This is considered an example of a Finding against QAM Policy Q-05-1 for failure to follow procedures (A-03-OSR-RPPWTP-010-F01c). (See Section 1.3.2 of Enclosure 2 for additional details.)

- d. Contractor's procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 13, 2003. Appendix 3 provided instruction for completing concrete pour cards.

Contrary to the above, during a review of completed concrete pour cards, the inspectors identified the following procedural discrepancies:

- Pour card LAW-0009 was missing procedure required current document revisions.
- Pour card LAW-0009B was missing procedure required specification revision and field engineering initial and date for embedded piping.
- Pour card LAW-0026 was missing procedure required specification revision, and QC initial and dated for "Embedded Piping" and "Other Embeds" when the "None" block was checked.
- Pour card PTF-C-0012 had "Hot Weather" box checked yes, indicating placement will occur during hot weather when conditions did not warrant a hot weather placement; procedure required "allowable placement rate" and "placement method" information was not entered; procedure required "n/a" not entered in "Other Embeds" and "Other Attributes" for QC and Superintendent blocks; and initials were in the "Other Attributes" Placement Acceptance block for QC Engineer when none was needed.
- The "None" block was checked for "Embedded Welding," "Embedded Piping," "Other Embeds," and "Other (specify)" attributes on pour card HLW-030, but the QC initialed and dated for "Embed Welding," "Other Embeds," and "Other (specify)" attributes. The superintendent initialed and dated for "Embedded Piping" and "Other Embeds."
- The "None" block was checked for "Embedded Anchor Bolts," "Embedded Piping," "Other Embeds," and "Other (specify)" attributes on pour card LAW-0037, but initials and dates for field engineering were not provided as required.
- The "None" block was checked for "Embed Welding," "Embedded Piping," and "Other (specify)" attributes on pour card LAW-0009, but initials and dates for the field engineering were not provided as required.
- Pour card PTF-C-0015 was missing required DCN 24590-PTF-DBN-S13T-00001 from the drawing list. The DCN changed the requirement to place 5000 psi concrete to 4000 psi concrete.

The above discrepant concrete pour cards is considered an example of a Finding against QAM Policy Q-05.1 for failure to follow procedures (A-03-OSR-RPPWTP-010-F01d). (See Section 1.3.2 of Enclosure 2 for additional details.)

The DOE Office of River Protection requests the Contractor provide, within 30 days of the date of the cover letter that transmitted this Notice, a reply to the examples of the Finding 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; 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 March 7 through April 21, 2003

REPORT NO: A-03-OSR-RPPWTP-010

FACILITY: Bechtel National, Inc.

LOCATION: 2435 Stevens Center  
Richland, Washington 99352

DATES: March 7 through April 21, 2003

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

APPROVED BY: P. Carrier, Verification and Confirmation Official  
WTP Safety Regulation Division

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## EXECUTIVE SUMMARY

### Introduction

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

- Adequacy of Chicago Bridge and Iron (CB&I) Waste Feed Receipt Tank Fabrication (Section 1.2)
- Adequacy of Forms, Reinforcement Steel, and Embedded Steel Items and Associated Concrete Placements (Section 1.3)
- Observation of Backfill and Compaction Activities (Section 1.4)
- Adequacy of Installation of Plant Wash and Disposal Tanks (Section 1.5)
- Adequacy of Pulse Vent Pressure Testing (Section 1.6)
- ALARA (as low as reasonably achievable) practices for construction activities (Section 1.7)
- Adequacy of Fire Protection Piping System Work Activities (Section 1.8)
- Adequacy of Balance-of-Plant Construction Activities (Section 1.9)
- Industrial Health and Safety (IH&S) Oversight (Section 1.10)
- Review of Inspection Follow-up Items (Section 1.11)

### Significant Observations and Conclusions

- CB&I had established and implemented provisions onsite to assure welding and radiographic examination of the waste receiving tank construction activities would be conducted in accordance with the Safety Requirements Document (SRD), American Society of Mechanical Engineers (ASME) Section VIII, ASME Section V, and quality assurance (QA) manual requirements. (Section 1.2)
- Concrete testing was performed in accordance with the technical specifications, procedures, and applicable American Society for Testing and Material requirements. (Section 1.3)
- With some exceptions, reinforcement steel installations and other attributes associated with concrete placements for the Low Activity Waste (LAW), High Level Waste (HLW), and Pretreatment Facility (PTF) were performed in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing quality



control (QC) activities for the work reviewed, and QC activities were documented as required by procedures. (Section 1.3)

- A number of PTF concrete placement deficiencies were identified during the first large PTF basemat placement. Construction management took effective action to improve control and performance during subsequent concrete placements. (Section 1.3)
- A Finding was identified against Quality Assurance Manual (QAM) Policy Q-05.1 for failure to follow procedures and drawings with four examples regarding (a) missing trim steel for a block-out in the LAW; (b) missing wall dowels after the concrete pour card was signed in the LAW; (c) Cold bending a # 9 wall dowel without authorization in the LAW; and (d) concrete pour card deficiencies (Finding A-03-OSR-RPPWTP-010-F01a, b, c, and d). Additional management attention was warranted in this area as evidenced by the examples of the Finding. (Section 1.3)
- The Contractor provided adequate implementing procedures specifying the method to be employed for backfill and compaction efforts. Soil compaction and testing was performed in accordance with specifications and procedures using calibrated testing equipment. (Section 1.4)
- The Contractor installed the anchor bolts and stainless steel liner plates for the Plant Wash and Disposal tanks in accordance with the requirements of the design drawing, ASME Section IX, and AWS D1.6 code. (Section 1.5)
- The Contractor accomplished pressure testing of the Pulse Vent piping system in accordance with established requirements. (Section 1.6)
- The Contractor and CB&I implemented and maintained an effective ALARA program during radiography. The Contractor had improved oversight of subcontractor radiography activities. (Section 1.7)
- The Contractor accomplished hydrostatic testing of fire service water piping systems in accordance with established requirements. (Section 1.8)
- Rebar and embedded item placement for the east third slab of building T-41 Mechanics Shop and Electrical Duct Banks was installed in accordance with technical specifications, procedures, and required codes and standards. (Section 1.9)
- Concrete for the Mechanics Shop 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 provided adequate implementation procedures specifying the method employed for application of bituminous dampproofing and was applying this material in accordance with these procedures. (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 being installed in accordance with specifications, procedures, and manufactures recommendations. (Section 1.9)
- Improvements were noted in the performance of temporary electrical power installations. (Section 1.9)
- The Contractor was generally implementing an assured grounding program in accordance with OSHA 29 CFR 1926.404(b)(1) and the 2002 NEC Article 527.6 requirements. Some isolated cords had not been tested during the current quarter. The Contractor continues to work on fully developing the required written program. Subcontractor assured grounding discrepancies were identified and subsequently addressed. (Section 1.9)
- Revision 1 of the Contractor's Health and Safety Plan changed the requirement for Lockout/Tagout from 29 CFR 1926 to 29 CFR 1910.147. The Contractor was not complying with 29 CFR 1910.147, which is a general, industry standard not intended for construction. The Contractor intends to revise the Health and Safety Plan to address this issue. (Section 1.10)
- A formal variance required by ORP M 440-1.2 is needed to address tower crane transition zone ladder way noncompliances. (Section 1.10)
- With the exception of the issues described above and seven minor instances, the Contractor had acceptably implemented the program for industrial health and safety. Identified minor discrepant conditions were promptly and acceptably corrected. (Section 1.10)
- Five Assessment Follow-up Items and two Occurrence Reports were closed during this inspection period. (Section 1.11)

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**ON-LOCATION INSPECTION REPORT FOR THE PERIOD  
MARCH 7 THROUGH APRIL 21, 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 CB&I Waste Feed Receipt Tank Fabrication (Inspection Technical Procedure (ITP) I-120 and 121)**

#### **1.2.1 Inspection Scope**

The inspectors examined the Contractor's work activities governing the welding and non-destructive examination of waste receiving tank weldments for conformance with the Chicago Bridge and Iron (CB&I) QA Manual, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV) Section VIII, 1998 Edition, and ASME Boiler and B&PV Section V, Article 2, as required by SRD Volume II, Safety Criterion 4.2-2.

#### **1.2.2 Observations and Assessments**

The inspectors performed a general overview of in-process welding on Waste Feed Receipt Tank Vessel B, ring 6, vertical welds A&B. The inspectors observed the final weld configuration, acceptance, and general workmanship were in conformance with welding details on drawing FRP-VSL-00002A, *Waste Feed Receipt*, Revision 3, dated August 28, 2002, and ASME Section VIII. The inspectors performed a general review of the radiographs on Vessel A, welds 6A & 6B for compliance to ASME Section VIII and ASME Section V, Article 2. The inspectors observed the weld quality and film quality were acceptable in accordance with the subcontractors procedures, ASME Section VIII, and ASME Section V.

#### **1.2.3 Conclusions**

The inspectors concluded CB&I had established and implemented provisions onsite to assure welding and radiographic examination of the waste receiving tank construction activities would

be conducted in accordance with SRD, ASME Section VIII, ASME Section V, and QA manual requirements.

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

#### **1.3.1 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 authorization basis (AB) and industry code and standard requirements, 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 – PTF-C-0008-1-A
- Concrete Pour Card – PTF-C-0008-1-C
- Concrete Pour Card – PTF-C-0008-2-A
- Concrete Pour Card – PTF-C-0012
- Concrete Pour Card – PTF-C-0013
- Concrete Pour Card – PTF-C-0015
- Concrete Pour Card – PTF-C-0026
- Concrete Pour Card – PTF-C-0027
- Concrete Pour Card – LAW-0009
- Concrete Pour Card – LAW-0009B
- Concrete Pour Card – LAW-0026
- Concrete Pour Card – LAW-0037
- Concrete Pour Card – HLW-030

#### **1.3.2 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 1, dated October 31, 2002.
- 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 4, dated February 5, 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 3, dated January 13, 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 4, dated March 10, 2003.
- 24590-PTF-DG-S13T-00014, *Pretreatment Facility Structural Concrete Reinforcement Partial Plan EL 0'-0" SH 1*, Revision 5, dated January 9, 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 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 exterior wall, embed plates, form configuration, clear cover requirements, splice lengths, joint preparation, and final clean up conformed to applicable drawings and procedure requirements. With the exception described below, the inspectors concluded the QC inspectors were thorough in verifying applicable reinforcement steel and related components within the placements, and were knowledgeable regarding the applicable specifications. The inspectors performed a general inspection of the above items and other attributes shown on the drawings applicable to the items being inspected. Also with the

exceptions described below, the inspectors concluded the inspections performed by the QC inspector were acceptable and the above attributes conformed to established requirements.

### Concrete Placements

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)*. For example, the inspectors observed a field engineer appropriately 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 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 placements identified above. The inspectors concluded the Material Testing subcontractor technicians were performing these testing activities in accordance with their procedures, the applicable American Society for Testing and Materials (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 except for the following discrepancies listed below. 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 4 vertical feet per hour maximum placement rate, established by the panel manufacturer, was being maintained. Wall placements were being performed using cut-away tremie systems, which insured 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 the *Engineering Specification for Concrete Work*.

The inspectors examined the above listed Concrete Pour Cards for placements observed during this inspection period, and concluded the required signatures were in place prior to the start of the placements, excluding Concrete Pour Cards listed below.

The inspectors observed revibration efforts on the above placements after completion of the final lifts and before the concrete has reached its initial set as required by the Pour Card and Contractor specification.

During the Pretreatment Facility (PTF) building placement of concrete, the inspectors noted one wall dowel did not have a corresponding vertical rebar attached. When this was pointed out to the Contractor, they elected to install a vertical rebar and continue the placement. The



Contractor's engineering department subsequently reviewed the rebar installation and based on the total number of rebar present, determined the original rebar configuration met the design specification.

### Performance Problems

Following approval of the Concrete Pour Card for Low Activity Waste (LAW) Curb Placement LAW-0026, by Construction, field engineering, and QC, signifying reinforcement steel was installed per the latest drawings and requirements, the inspectors identified missing trim steel for a pipe block-out on the east curb wall for tank vessel # NLD-VSL-00005. After some discussions between the QC inspector and the applicable field engineer, two additional # 9 bars were installed. Following the placement of concrete, the Contractor generated nonconformance report (NCR) number 24590-WTP-NCR-CON-03-032, documenting a condition where short tension lap splice length of the added bars did not comply with the Contractor's drawings, procedures, or specification. Failure to install rebar in placement LAW-0026 in accordance with the drawings and engineering specifications is considered an example of a Finding against QAM Policy Q-05.1 for failure to follow procedures or drawings (Finding A-03-OSR-RPPWTP-010-F01a).

During placement of concrete for LAW-0009, the inspectors identified two # 11 wall dowels were missing after the concrete pour card was signed and during the concrete placement. The Contractor concurred and the two missing bars were installed. Failure to install rebar in placement LAW-0009, in accordance with the drawings and engineering specifications is considered an example of a Finding against QAM Policy Q-05.1 for failure to follow procedures or drawings (Finding A-03-OSR-RPPWTP-010-F01b).

During the LAW wall placement, the inspectors observed a worker cold bending a # 9 wall dowel without authorization. The Contractor generated NCR # 24590-WTP-NCR-CON-03-049 for cold bending # 9 wall dowel without authorization. This is considered an example of a Finding against QAM Policy Q-05.1 for failure to follow procedures (Finding A-03-OSR-RPPWTP-010-F01c).

During review of pour card LAW-0009, the inspectors identified the current document revisions were not listed on the pour card as required by the Contractor's procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 13, 2003. The Contractor generated Corrective Action Report (CAR) # 24590-WTP-CAR-QA-03-089 for missing wall dowels and missing revisions listed on the Concrete Pour Card.

The inspectors reviewed several other concrete pour cards for completeness in accordance with the Contractor's procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 13, 2003, appendix 3 and identified the following additional discrepancies:

- LAW-0009B: missing specification revision; and missing field engineering initial and date for embedded piping.

- LAW-0026: missing specification revision; and QC initial and dated for "Embedded Piping" and "Other Embeds" with the "None" block was checked indicating no embeds were installed.
- PTF-C-0012: "Hot Weather" box checked yes, indicating placement will occur during hot weather when conditions did not warrant a hot weather placement; "allowable placement rate" was not entered; "placement method" was not entered; n/a not entered in "Other Embeds" and "Other Attributes" for QC and Superintendent blocks; and initials were in the "Other Attributes" Placement Acceptance block for QC Engineer when none was needed.
- HLW-030: for "Embedded Welding," "Embedded Piping," "Other Embeds," and "Other (specify)" attributes, the "None" block was checked; however, QC initial and dated for "Embed Welding," "Other Embeds," and "Other (specify)" attributes. The superintendent initial and dated for "Embedded Piping" and "Other Embeds."
- LAW-0037: for "Embedded Anchor Bolts," "Embedded Piping," "Other Embeds" and "Other (specify)" attributes, the "None" block was checked; however, initials and dates for field engineering was not provided as required
- LAW-0009: for the "Embed Welding," "Embedded Piping," and "Other (specify)" attributes, the "None" block was checked, however, initial and dates for the field engineering was not provided as required.
- The inspectors verified the latest revisions to the listed drawings on concrete pour card PTF-C-0015. The inspectors determined one design change was missing from the pour card. Design Change Notice (DCN) 24590-PTF-DBN-S13T-00001 was listed against the drawing 24590-PTF-DB-S13T-00005 in the control station but not listed on the concrete pour card. The DCN changed the requirement to place 5000 psi concrete to 4000 psi concrete. This was not in accordance with construction procedure 24590-WTP-GPP-CON-3203, *Concrete Operations (Including Supply)*, Revision 3, dated January 13, 2003. Appendix 3 of the procedure, item 11 stated "List applicable design drawings, Specification Change Notices, FCR's, FCN's, DCN's, etc. The FE is responsible for assuring the current issued revision at the time of the concrete pour is used and listed for the applicable documents. If the Pour Card documents a work activity required for closure of an NCR or Deficiency Report (DR), the NCR or DR number shall identified here as well."

The above discrepant concrete pour cards is considered a Finding against QAM Policy Q-05.1 for failure to follow procedures or drawings (Finding A-03-OSR-RPPWTP-010-F01d).

During PTF Basement Placement PTF-C-0012, the inspectors identified to Contractor personnel several discrepancies throughout the placement. The following discrepancies were:

- Concrete was being deposited in excess of the 5-foot free fall requirement; this was corrected as the placement proceeded.
- Miscellaneous debris was observed in the forms, the Contractor removed the identified debris.
- Excess delays before cement finishers were able to begin final screeding and finishing; however, the concrete surface was still workable to finish correctly.
- Numerous areas of nearly dry concrete was observed on the top mat of rebar; the Contractor removed the concrete from the rebar.
- The Contractor provided inadequate wind protection to aid the cement finishers; however, because of mild temperatures, finishers were able to complete their task.

The inspectors discussed the above discrepancies at the time of the placement, and later raised them with senior construction management. Construction management met with PTF concrete placement staff and developed actions to effect improvements to preclude similar performance concerns. For example, the Contractor improved the sequencing of lift placements to shorten the time between lifts and assigned staff to keep upper layers of rebar clean between lifts. Subsequent placements were better controlled and performance improvements were noted. However, additional management attention was warranted as evidenced by the Findings described above.

### **1.3.3 Conclusions**

The inspectors concluded the following:

- Concrete testing was performed in accordance with the technical specifications, procedures, and applicable ASTM requirements.
- With some exceptions, reinforcement steel installations and other attributes associated with concrete placements for the LAW, High Level Waste (HLW), and PTF were performed in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing QC activities for the work described above, and QC activities were documented as required by procedures.
- A number of PTF concrete placement deficiencies were identified during the first large PTF basemat placement. Construction management took effective action to improve control and performance during subsequent concrete placements.
- A Finding was identified against QAM Policy Q-05.1 for failure to follow procedures and drawings with four examples regarding (a) missing trim steel for a block-out in the LAW; (b) missing wall dowels after the concrete pour card was signed in the LAW; (c) Cold bending a # 9 wall dowel without authorization in the LAW; and (d) Concrete Pour Card

deficiencies (Finding A-03-OSR-RPPWTP-010-F01a, b, c, and d). Additional management attention is warranted in this area as evidenced by the examples of the Finding.

## **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 soil backfill and observed backfilling operations around the south side of the LAW basemat.

### **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 12, 2002.

Based upon examining the listed documents, the inspectors concluded the Contractor had provided adequate implementation procedures for ITS backfill and adequate design drawings to assure location of ITS backfill.

The inspectors observed backfill (12 inch loose lift) and compaction on the south side of the LAW at elevation 662.91. 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 and testing was performed in accordance with specifications and procedures.

### **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. The inspectors also

verified soil compaction and testing was performed in accordance with specifications and procedures using calibrated testing equipment.

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

### **1.5.1 Inspection Scope**

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

### **1.5.2 Observations and Assessments**

The inspectors witnessed the installation of the Plant Wash and Disposal (PWD) Tanks, PWD-VSL-00045 and PWD-VSL-00046, anchor bolts and stainless steel liner plates in the firewater pit at the PTF. The inspectors verified the material used for installation and welding of 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 SHI*, 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 Contractor's drawing, ASME Section IX, 1995 Edition, and American Welding Society (AWS) D1.6-99 codes. The inspectors verified fieldwork packages PTF-M-S-0001 & PTF-M-S-0002 were completed acceptably. The inspectors verified tank alignment was acceptable over the welded anchor bolts.

### **1.5.3 Conclusions**

The inspectors concluded the Contractor 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.

## **1.6 Adequacy of Pulse Vent Pressure Testing (ITP I-121)**

### **1.6.1 Inspection Scope**

The inspectors observed the pressure test of the Pulse Vent piping at the HLW building.

### **1.6.2 Observations and Assessments**

The inspectors examined the Contractor's test packages and observed the Pulse Vent piping pressure test for compliance to the requirements of ASME B31.3 sections 345.5 (Pneumatic Leak Test) and 345.8 (Sensitive Leak Test). The inspectors verified the proper test boundaries were specified, valve line-ups were thorough, the proper pressure device was installed, 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 ASME B31.3, Process Piping.

The inspectors observed the conduct of pressure testing on the Pulse Vent Piping and verified pressure testing had been conducted in accordance with the Contractor's established requirements and B31.3, and the system tests conformed to established requirements regarding leakage and time at pressure.

### **1.6.3 Conclusions**

The inspectors concluded the Contractor had accomplished pressure testing of the Pulse Vent piping system in accordance with established requirements.

## **1.7 ALARA Practices for Construction Activities (ITP I-111)**

### **1.7.1 Inspection Scope**

The inspectors interviewed Contractor and Waste Feed Receipt Tank fabrication sub-contractor (CB&I) staff, reviewed documents, and observed construction activities to determine if the Contractor had implemented and maintained an effective ALARA program. Specifically, this portion of the inspection focused on observation of the subcontractor's radiography safety activities and the Contractor's oversight of those activities.

### **1.7.2 Observations and Assessments**

Because radiography represents the greatest opportunity for workers to receive unplanned dose during construction, the inspectors viewed the Contractor's oversight of a subcontractor's construction radiography safety activities and the subcontractor's radiography safety activities on April 3, 2003.

The inspectors observed the subcontractor's Lead Radiographer perform the radiography activities after normal work hours to keep the doses to construction workers ALARA. An Assistant Radiographer was present to help the Lead Radiographer, as was required by the license. The subcontractor had roped off and appropriately posted the radiation area boundary around the radiography activity. The subcontractor confirmed the boundary was set at appropriate distances from the radiography source by performing surveys with an ion chamber detector. The surveys indicated the dose rate to an unmonitored individual (e.g., construction

worker) was less than the required 2 mrem per hour. The subcontractor's survey instrumentation indicated the instrumentation had been calibrated within the last 6 months as required by procedure; the subcontractor used the instrumentation appropriately. The subcontractor wore appropriate dosimetry and had the appropriate licenses, procedures, and records available as required by the license and procedures. The Ir-192 radiography source holder had the appropriate, legally required labeling.

As part of its new quarterly oversight program, the Contractor Radiological Operations Lead (ROL) and Radiological Control Technician (RCT) viewed the subcontractor's radiography safety activities. The RCT performed surveys of the radiation area boundary with the subcontractor's Lead Radiographer and found the boundary appropriately placed so the dose rate was less than the 2 mrem per hour limit. The survey readings of the Contractor RCT and the subcontractor Lead Radiographer were consistent. The Contractor's survey instrument also indicated it had been calibrated within the last 6 months as required by procedure. The ROL checked to make sure the subcontractor had appropriate dosimetry and instrumentation, performed appropriate surveys, had emergency phone numbers available, and had available required documentation. The ROL found 2 issues as follows: (1) The subcontractor was not documenting the survey levels outside of the source storage container after the source was returned to the storage container, and (2) the local emergency phone numbers were not readily available to the subcontractor's Lead Radiographer. Based on the above, the inspectors concluded the Contractor performed a thorough review of the subcontractor's radiography activities.

In addition to the items identified by the Contractor, the inspectors found the dose rate limit for individuals less than age 18 incorrectly specified in the subcontractor's procedures (*CB&I Isotope Radiation Safety Manual, Section 2, Individual Exposure & ALARA Program, April 2002*). The procedure incorrectly listed the dose rate limit as 125 rem in a calendar quarter rather than 125 mrem in a calendar quarter. The inspectors communicated this to the ROL who conveyed the inspectors' observation and the ROL issues to the subcontractor. The subcontractor took prompt corrective actions including correcting the procedure, posting the emergency phone numbers in the subcontractor's NDE shack, and documenting surveys of the outside of the source storage container. The inspectors found this acceptable.

Regarding Assessment Follow-up Item A-03-OSR-RPPWTP-003-A02 from the November 2002 ALARA inspection, the Contractor had not yet completed all the corrective actions it committed to during the November 2002 ALARA inspection so the inspectors were not able to close the AFI. From interviews with the Contractor and observation of preliminary documents, the inspectors determined progress had been made; completion of the corrective actions was expected by the end of the second quarter of calendar year 2003. The ORP will inspect the completed Contractor corrective actions during the 2003 ALARA inspection.

### **1.7.3 Conclusions**

From observations of radiography, the inspectors determined the subcontractor and Contractor had implemented and maintained an effective construction ALARA program. There were indications of improved Contractor oversight of subcontractor radiography activities.

## 1.8 Adequacy of Fire Protection Piping System Work Activities (ITP I-138)

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

### 1.8.2 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 2, dated September 9, 2002.
- 24590-BOF-C2-C12T-00031, *Firewater, Potable Water, Plant Service Air Yard Utility Composite Plan - Area 31*, Revision 4, dated March 7, 2003.

The inspectors examined test packages 24590-WTP-PTR-P-03-0045, Revision 0, balance-of-facility (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; and 24590-WTP-PTR-P-03-0051, Revision 0, BOF Area 21 & 22. 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.

### **1.8.3 Conclusions**

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

## **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**

#### Hydrostatic Pressure Testing of PVC Potable Water Piping

The inspectors examined the hydrostatic test packages 24590-WTP-PTR-P-03-0046, Revision 0, BOF Area 27 and 24590-WTP-PTR-P-03-0052, Revision 0, BOF Area 27, and observed the conduct of hydrostatic testing on one Polyvinyl Chloride (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.

From examination of test package 24590-WTP-PTR-P-03-0046, 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 27 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.

#### Application of bituminous dampproofing for the LAW

The inspectors examined the following documents governing the installation of bituminous dampproofing for the LAW.

- 24590-WTP-3PS-ATWF-T0001, *Bituminous Dampproofing 07115*, Revision 0, dated August 27, 2001.
- 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-013000001, *LAW Vitrification Building Architectural Elevator Plans and Sections*, Revision 0, dated October 18, 2002.

Based upon the above examinations, the inspectors concluded the Contractor had provided:

- Adequate implementation procedures for application of bituminous dampproofing.
- Adequate design drawings to assure location of bituminous dampproofing.
- Adequate provisions to assure that only acceptable bituminous dampproofing would be applied.
- Adequate specification for application of bituminous dampproofing.

The inspectors observed application of bituminous dampproofing on the south wall of the LAW and concluded it was applied in accordance with the Contractors specification and manufacturer's data.

T41-Mechanics Shop

The inspectors reviewed Mechanics Shop slab rebar and sump frame installation (east third) on grade to elevation 649'-3". Using the drawings and specifications listed below, the inspectors determined rebar size, correct lap length (spot check) and embed type, size, and location.

- Concrete Pour Card-T41-S1
- 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.

The inspectors observed the Materials Testing subcontractor field technicians performing concrete receipt activities, the review of batch tickets, and 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, 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 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 pour card 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 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 and truck chute which insured 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 in accordance with the Contractor's concrete procedure. The inspectors concluded the conduit, reinforcement, and concrete were installed in an acceptable manner in accordance with the design requirements.

#### Installation of Chilled Water, Cooling Water Pipelines

The inspectors reviewed the materials and witnessed the installation of the 48-inch Cooling Water system. The inspectors verified the markings on the pipe/fittings 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 the cooling water line south of the HLW building. The Contractor was using the manufacture's instructions for installing a restrained joint ductile iron pipe assembly system. The inspectors concluded the Contractor was installing the cooling water system in an acceptable manner in accordance with the manufactures 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.

#### Pretreatment Facility Grounding Installation

The inspectors examined the grounding cables, splices, ground plates, and grounding configuration prior to concrete placement at the Pretreatment Facility, associated with work package PTF-C-0012. 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-00003, *Pretreatment Facility Grounding Layout EL. 0'0" Area 1*, Revision 1, dated May 3, 2002.
- 24590-PTF-E22-GRE-00006, *Pretreatment Facility Grounding Layout EL. 0'0" Area 4*, Revision 1, dated August 29, 2002.

The inspectors concluded the Contractor's grounding cable installation conformed to the documents described above and to the 2002 National Electrical Code (NEC).

#### Pretreatment Facility Conduit Installation

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

- 24590-PTF-E2-LTE-00004, *Pretreatment Facility Lighting Layout Elevation 0'0" Area 4*, Revision 0, dated September 12, 2002.
- 24590-PTF-E2-LTE-00003, *Pretreatment Facility Lighting Layout Elevation 0'0" Area 3*, Revision 0, dated September 18, 2002.
- 24590-PTF-FSK-CON-E-03-004, *Embedded Lighting Conduit Pretreatment Facility Elevation 0'0"*, Revision 1, dated March 26, 2003.

The lighting drawings showed all exposed conduit runs. 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 NEC.

#### Temporary General Distribution Rack GDR-006 (Electrical)

The inspectors examined temporary construction general distribution rack GDR-006, located at the southeast corner of the PT 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 NEC Inspection Report Number 24590-WTP-EIP-CON-03-020. The following electrical equipment was examined at the distribution rack: (1) 480-volt 200 amp main disconnect; (2) three-100 amp spare disconnects (line side only); (3) 30 amp welder disconnect (20 amp fuse); and (4) 100 amp disconnect (fused 60 amp) for mini load center MPC-006.

The inspectors observed the Contractor had installed general distribution rack GDR-006 in accordance with the 2002 NEC.

#### Temporary General Distribution Rack GDR-011 (Electrical)

The inspectors examined temporary construction power distribution rack GDR-011, located at the northwest corner of the PT 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 NEC Inspection Report Number 24590-WTP-EIP-CON-03-019. The following electrical equipment was examined at the distribution rack: (1) 480-volt 200 amp main disconnect; (2) 100 amp disconnect #1 (fused 70 amp) feeding stud welder; (3) 100 amp disconnect #2 (fused 30 amp) feeding welders; (4) 100 amp disconnect #3 (fused 20 amp) feeding welders; (5) 30 amp disconnect (fused 20 amp) for shear; (6) 100 amp disconnect (fused 60 amp) feeding mini load center; (7) 25 KVA single-phase mini load center MPC-011; and (8) splice boxes with cord drops for welders.

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 240.6 requires flexible cord and flexible cable be protected by an overcurrent device in accordance with their ampacity as specified in Table 400.5(A) and Table 400.5(B). In accordance with Table 400.5(A) the allowable ampacity for a three current carrying conductors #12 AWG (type SOW) cord is 20 amps.

The Contractor installed 30 amp fuses, rather than the required  $\leq 20$  amp fuses; in disconnect #2 for the overcurrent protection of the #12 AWG cord drops feeding the welders.

The inspectors discussed this NEC noncompliance with the electrical field engineer and the Contractor agreed the fuses were sized incorrectly and subsequently replaced the 30 amp fuses with 10 amp fuses. The inspectors verified the correction. This resolves this issue.

#### Temporary Primary Distribution Rack PDR-016 (Electrical)

The inspectors examined temporary construction power distribution rack PDR-016, located at the northeast corner of the PT 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 Temporary Power Request Form Number 24590-WTP-EIP-CON-02-028. The following electrical equipment was examined at the distribution rack: (1) 480-volt 400 amp main disconnect; (2) 225 amp panelboard; (3) 100 amp disconnect (fused 70 amp) feeding general distribution rack GDR-006; (4) two-30 amp disconnects (fused 20 amp) for welding receptacles; and (5) 100 amp disconnect (fused 60 amp) feeding mini load center MPC-002.

The inspectors observed the Contractor had installed general distribution rack PDR-016 in accordance with the 2002 NEC.

#### Temporary Power to Connex Boxes

The inspectors observed flexible cords feeding various connex boxes (two located north of T-11 building and one located east of the PTF building). With the exception of two deficiencies, which also had been identified by the Contractor and subsequently resolved, the inspectors determined the Contractor had installed this equipment in accordance with the 2002 NEC.

#### Vehicle Maintenance Building

The inspectors examined the installation of rigid nonmetallic PVC conduit and rigid metal conduit at the Vehicle Maintenance Building, prior to backfill, to determine Contractor's compliance with Field Sketch 24590-WTP-FSK-CON-T-02-020, *Temporary Building Mechanics Shop Electrical Lower Plan Lighting, Electrical Service*, Revision 1, dated

October 10, 2002, Field Sketch 24590-WTP-FSK-CON-T-02-021, *Temporary Building Mechanics Shop Electrical Upper Plan Lighting, Electrical Service*, Revision 1, dated October 10, 2002, and the 2002 NEC.

To perform this inspection, the inspectors reviewed Temporary Power Request Form Number 24590-WTP-EIP-CON-02-049.

The inspectors observed the Contractor had installed the conduits in compliance with the above design and the 2002 NEC.

#### Temporary Power for Pipefitters and Electricians Connex's

The inspectors examined the temporary power distribution rack for the Pipefitters and Electricians connex's located at the east end of PT slab 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 Temporary Power Request Form Number 24590-WTP-EIP-CON-03-001. The following electrical equipment was examined at the connex's: (1) 480-volt 200 amp main disconnect; (2) 100 amp spare disconnect (line side only); (3) 100-amp pipefitter's welder disconnect (no fuses installed); (4) 30 amp spare disconnect (line side only) and 100-amp transformer disconnect (60 amp fuses). The 25 KVA transformer and 100-amp panelboard were energized and, therefore, were unable to be opened for inspection.

The inspectors observed the Contractor had installed the above distribution rack in accordance with the 2002 NEC.

#### Space Heaters in the Back Flow Preventer Enclosures

The inspectors examined electrical power for space heaters in the back flow preventer enclosures, one located west of guard house T-23 and the other west of guard house T-31, 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 Forms 24590-WTP-EIP-CON-02-043 & 24590-WTP-EIP-CON-02-042.

The inspectors observed the Contractor had installed the panelboards, space heaters, and associated hardware, for the above mentioned back flow preventer enclosures, in accordance with the 2002 NEC.

#### Potain Tower Crane (Electrical)

Potain tower cranes have been extensively documented and discussed in Inspection Report A-03-OSR-RPPWTP-001, A-03-OSR-RPPWTP-006, and A-03-OSR-RPPWTP-008. The inspectors performed a follow-up inspection of this area to examine the Contractor's actions to resolve electrical wiring and hardware issues associated with the Potain tower cranes regarding wiring

and hardware not listed as acceptable by a Nationally Recognized Testing Laboratory (NRTL). The inspectors witnessed the following electrical testing performed on all three cranes by TUV and the Contractor during functional, operational, and load testing: (1) amperage readings recorded while crane was performing three different functions at the same time; (2) voltage readings; (3) temperature readings at various equipment and terminations; and (4) high potential testing of the cables at 2,500 volts. All electrical testing performed was acceptable.

TUV Rheinland, Inc. (TUV), an NRTL, performed a final field evaluation and accepted/certified the LAW, HLW, & PTF cranes to the general electrical requirements of NFPA 70, the NEC, NFPA 79, *Electrical Standard for Industrial Machinery*, and ASME B30.4 Section 4-1.14.1, *American National Standard for Portal, Tower, and Pedestal Cranes* (electrical section). This resolved all the electrical issues and after the load and functional tests were performed, the cranes were subsequently placed into operation (see Section 1.10.2 of this report for further details regarding certifying and load testing the cranes).

#### Assured Grounding Program

During the previous on-location inspection period January 25 through March 6, 2003, the inspectors informed the Contractor it was in noncompliance with 2002 NEC and IH&S regarding the assured grounding requirements for temporary electrical power and lighting. The Contractor had taken action to comply with the testing requirements and was in the process of initiating a written procedure for the assured grounding program. This item was documented and tracked as follow up item A-03-OSR-RPPWTP-008-A06, in previous Inspection Report A-03-OSR-RPPWTP-008, Section 1.10.2.

The inspectors observed various cords not identified (with a green colored band) validating the cords had been tested to the assured grounding program as specified in Occupational Safety & Health Administration (OSHA), 29 CFR 1926.404(b)(1) and the 2002 NEC, Article 527.6, for the new quarter (April, May, June), in the following locations: (1) Ironworkers Connex; (2) Cords labeled SC-341, SC-343, & SC-342 installed at generator RL-53028 feeding mobile office JO-04-046 and spider box ISB-093; (3) Cord labeled SC-51 installed on the west side of PTF, spider box SB-055; (4) cord and plug welders located in the PTF and LAW; and (5) HLW northwest corner, panel PDP-014 circuits 1, 3 & 5, 7.

The inspectors discussed the above issue with the Contractor and the Contractor subsequently tested all of the cords listed above. This resolved this issue.

#### Batch Plant - Assured Grounding Program

The inspectors discussed with the Batch Plant sub-contractor compliance to the assured grounding program, directed by the Contractor in a memorandum dated March 18, 2003, and as specified by OSHA 29 CFR 1926.404(b)(1) and the 2002 NEC Article 527.6.

The sub-contractor was unaware of the following requirements: (1) ground-fault circuit interrupter (GFCI) protection is required on all 120-volt, single-phase 15-, 20-, and 30-ampere receptacle outlets on construction sites, which are not part of the permanent wiring, and used by



employees; (2) testing of temporary cords is required quarterly, with the second quarter beginning in April; and (3) the requirement of a written assured grounding program.

The sub-contractor subsequently (1) purchased and installed listed portable GFCI's for all 120-volt circuits used by employees; (2) provided training to the all workers using temporary wiring; (3) perform the required quarterly tests on all temporary cords; and (4) provided a copy of the Sub-Contractor's assured equipment grounding conductor program procedure. This resolves this issue.

#### PTF Waste Feed Receipt Tank Fabrication Sub-Contractor - Assured Grounding Program

The inspectors discussed with the sub-contractor compliance with the assured grounding program implemented, by the Contractor, in a memorandum dated March 19, 2003, as specified by Occupational Safety & Health Administration OSHA 29 CFR 1926.404(b)(1) and the 2002 NEC Article 527.6.

The sub-contractor was aware of the requirements. The inspectors observed the sub-contractor performing the quarterly test on temporary cords and verified cords used by employees had GFCI protection. The sub-contractor stated a written program was in the process of being written by the Contractor and would be implemented by the sub-contractor providing consistency of the assured grounding program throughout the construction site. Follow-up of this item will continue to be tracked as follow up item A-03-OSR-RPPWTP-008-A06.

### **1.9.3 Conclusions**

The inspectors concluded the following:

- Rebar and embedded item placement for the east third slab of building T-41 Mechanics Shop and Electrical Duct Banks was installed in accordance with technical specifications, procedures, and required codes and standards.
- Concrete for the Mechanics Shop and Electrical Duct Banks was produced, placed and consolidated in accordance with technical specifications, procedures and required codes and standards.
- The Contractor provided adequate implementation procedures specifying the method to be employed for application of bituminous dampproofing and was observed installing this material in accordance with these procedures.
- The Contractor accomplished hydrostatic testing of PVC Potable Water Piping in accordance with established requirements.
- Installation of the 48-inch Cooling Water System was being installed in accordance with specifications, procedures, and manufactures recommendations.

- Improvements were noted in the performance of temporary electrical power installations.
- The Contractor is generally implementing an assured grounding program in accordance with OSHA 29 CFR 1926.404(b)(1) and the 2002 NEC Article 527.6 requirements. Some isolated cords were found that had not been tested. The Contractor continued to work on developing the required written program.
- Subcontractor assured grounding discrepancies were identified and subsequently addressed.

## **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 1, dated December 30, 2002, 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; maintenance of heavy equipment (as specified within 29 CFR 1926); safety practices during performance of maintenance services; and hazards reviews associated with BOP facilities.

### **1.10.2 Observations and Assessments**

#### Lockout and Tagout:

As a result of the Contractor's revised Nonradiological Safety and Health Program (used as the basis for this inspection), the basic compliance reference for lockout and tagout was changed in Revision 1 of the Contractor's HSP from construction applied requirements referenced in 29 CFR 1926 (under Revision 0) of the HSP to 29 CFR 1910.147, a general industry standard which was not intended to be applied to construction operations. The inspectors reviewed the existing Contractor's Lockout/Tagout procedure, referenced below against the Contractor's initiated compliance reference of 29 CFR 1910.147 to determine whether the Contractor's procedure conformed to the elements of the above referenced CFR and the elements of 29 CFR 1910.147 were being applied within the construction site operating procedures.

The inspectors determined the requirements within the 29 CFR 1910.147 required the Contractor to specifically provide the following actions:

1. Training of identified affected and other workers who would be likely within the boundary of the energy associated with the lockout/tagout.
2. Requirements to provide proper lockout/tagout protection while servicing, testing, or performing maintenance on equipment.
3. Periodic review of the proper application of the Contractor's procedures and all elements of the CFR requirement. Such review was to be conducted by a disinterested person or persons within the Contractor's staff and the review was to have been completed at least annually.
4. Further, the Contractor's HSP required all subcontractors to conform to elements of the Contractor's Lockout and Tagout procedures.

The inspectors determined the Contractor had not trained the necessary personnel within the workforce as specified within 29 CFR 1910.147. The inspectors were unable to observe a class presented by the Contractor but reviewed the published lesson plan and interviewed the instructor. The classroom training was only provided for craft foremen and non-manual employees, thereby excluding other required personnel such as affected workers and potentially affected workers.

The inspectors noted the Contractor had performed one internal review of the Contractor's lockout/tagout program. However, the inspectors determined through an examination of the internal assessment document and through interviews, the required review did not conform with the requirements of 29 CFR 1910.147 as the review was determined to be an audit of logs and permits of the previous two months and did not include a walk down of the Contractor's procedure compliance nor an assessment of compliance with all elements of 29 CFR 1910.147. Further, the review did not include the assessment of the major subcontractor's lockout/tagout compliance as required by the Contractor's HSP.

The inspectors walked down the start up and testing for service of the PT Potain tower crane against the requirements of both the Contractor's procedure and 29 CFR 1910.147. No specific lockout/tagout procedure was provided for the Contractor or subcontractor personnel who had been required to work around and on potentially energized rotating equipment and nip points (sheaves and rope) when setting up the crane for service. During on site interviews with both the crane operator and the operating engineer foreman, the inspectors determined both the foreman and the operator were knowledgeable in the basic requirements in establishing energy control boundaries for the jobs undertaken. The inspectors determined, through verification of radio transmission on the ground and in the operator's station, clear radio signals and transmission clearance was initiated. The inspectors determined the operator, who was energizing and de-energizing the sheaves and rope, was clearly aware of the mechanics and electricians safe and clear positions. Line of sight contact between the operator and the mechanics and electricians was not possible. Thus, radio contact was the primary means of assuring safe personnel clearance. The inspectors also determined, through verification and operation, a redundant mechanical disengagement means for stopping energy to the moving parts was provided within the operator control levers - an electrical "deadman". This redundancy, coupled with disciplined radio transmission controls, provided a credible degree of safety. Although the task did not

conform to the necessary requirements of 29 CFR 1910.147, whereby an examination and a procedure /permit of the job was required prior to start, the inspectors determined the activity would have been in conformance with the requirements of 29 CFR 1926, construction requirements.

The inspectors determined 24590-WTP-GPP-SIND-008 *Lockout and Tagout -Revision 3*, dated November 7, 2002, did not conform to all aspects of 29 CFR 1910.147. The Contractor was in the process of evaluating the commitment to 29 CFR 1910.147 and was considering a revision to the HSP to reflect a program better suited to a construction site. Follow-up on the Contractor's actions to address the noncompliance to the approved HSP will be tracked as assessment follow-up item A-03-OSR-RPPWTP-010-A02.

### Hoisting and Rigging

The inspectors witnessed and inspected the tower crane readiness, testing, and maintenance performed during the period in order to verify safety and health deficiencies, noted in previous inspections, were adequately mitigated or closed. The inspectors reviewed the following items and found them to conform to the requirements of the Contractor's HSP: (a) strain relief was provided for all flexible electrical cords which extended from the base of the crane to the tower and; (b) adequate personnel barriers to prevent personnel access from rotating and moving equipment, i.e. sheaves, and rope were provided.

Further administrative controls, in addition to barriers, were provided to prevent personnel from entering the jib footwalk such as signage requiring personnel to gain permission from the operator prior to ascending the ladder. The issue of footwalk stability, deformation, and footwalk weld and metal cracks, discussed in Inspection Report A-03-OSR-RPPWTP-008, Section 1.9, was re-inspected by the inspectors on the entire LAW boom jib. The inspectors determined the LAW footwalk cracks and breaks had been repaired. Further, the inspectors observed the Contractor repairing the footwalks on the HLW jib.

Five sequential metal breaks on one section of the PTF counter jib footwalk prompted the inspectors to request the Contractor to deny access to this area until adequate repairs had been completed. The Contractor roped off the area in question pending completion of repairs. The Contractor notified the inspectors the PTF footwalk repairs had been completed. The issue of deformation, buckling, and load carrying capability still required an engineering evaluation for all three tower crane footwalks. The Contractor had requested the vendor provide them footwalk material specifications. The Contractor had committed to provide an engineering assessment of the load carrying capability based upon the ASME standard upon receipt of those specifications. The engineering assessment had not been completed during this inspection period.

During the inspection of the stability of the jib footwalks, the inspectors noted a few welds on the jib lattice that did not appear to provide full penetration into the top chord. The LAW crane had successfully passed the ASME required load and brake test and had been load tested at 360 degrees, with no visible signs of weld or metal fracture noted by the inspectors. Nevertheless, the Contractor stated the crane manufacturer would provide weld drawings and specifications to be assessed by the Contractor's authorized person to ensure conformance with structural welding requirements within ASME B30.3, prior to operating the crane at maximum safe load. Welding

data had been provided to the inspectors during this inspection. Results of the Contractor's welding conformance assessment had not been completed.

The Contractor was completing repairs on the non-transition and transition zone ladderways on the LAW, PT, and HLW tower cranes. The Contractor committed to repair those items during the crane operation on the back-shift. The inspectors had inspected the repaired non-transition zone ladder ways on the PT and LAW tower cranes. The inspectors determined the rung gripping, stepping surface, and hatchway entry had been adequately repaired with the exception that a deflection guide was required for one spot where the horizontal distance from the rung to an obstruction was nonconforming. The Contractor's management was aware of this requirement and was in the process of providing conforming hardware. With the installation of a deflection device the non-transition zone ladders will conform to the requirements of ASME B30.3. The inspectors inspected the repaired transition zone ladders with a Contractor safety engineer. With the exception of one area, which was very narrow, the steps and gripping was comfortable and adequate. However, the lateral distance from the rung to the obstructions did not comply with ASME B30.3 and the horizontal climbing distance from the rungs to the backside obstruction did not comply.

The inspectors agreed with the Contractor that it would be structurally impossible to conform to the requirements for ladderways within the transition zones of the existing tower cranes. As a result, the inspectors informed the Contractor they would be required to submit a formal request for a variance against the ASME B30.3 requirements in accordance with ORP M440-1.2. This nonconformance will be tracked as assessment follow-up item A-03-OSR-RPPWTP-010-A03

The inspectors attended meetings held by the Contractor where the tower crane open items were statused. The inspectors determined the Contractor had completed the open items, which would have limited preparation for start-up of the LAW, PTF, and HLW tower cranes. The Contractor then placed the cranes in service in a de-rated capacity pending the outcome of the jib weld assessment. The de-rating consisted of operating the crane at less then or equal to 90% of its safe maximum load capability.

After the tower cranes were evaluated and certified by the subcontractor (TUV) for electrical safety issues associated with the NEC and OSHA, the inspectors witnessed functional load tests for the HLW and the PTF Potain tower cranes and the limit switch adjustments. The cranes were tested against *Rigging Package, Critical Lift Tests* 24590-WTP-RIG-CON-03-052, and 24590-WTP-CON-03-053, dated February 26, 2003. The inspectors determined the cranes conformed and performed to the requirements of the above referenced documents. The inspectors also witnessed the Contractor's re-evaluation of one limit switch setting on the LAW crane. The inspectors determined the switch test conformed to the Contractor's test procedure.

On two occasions the inspectors (accompanied by the Contractor's rigging engineer) found two heavy lift chokers lying in the dirt. This practice was not in conformance with 29 CFR 1926.251 or the Contractor's procedures. Immediate corrective action was taken by the Contractor's rigging engineer.

The inspectors reviewed rigging package 24590-WTP-RIG-CON-03 –*Medium Lift Category PT C2 & C3 Drain Collection Vessel Installation*, dated April 4, 2003, and determined the package was in conformance with the Contractor's procedure.

Although progress had been made on many tower crane structural open issues, some were still open, i.e., footwalk engineering assessment and the welding assessment of the jibs. The Contractor was expected to provide both the welding and structural assessments of the jib chord and footwalks. These issues remain as open items for Contractor resolution and will continue to be tracked under assessment follow-up item A-03-OSR-RPPWTP-006-A02.

During a tour of the construction site, the inspectors observed attached (swing out) barricades were installed on the Linkbelt model 278 mobile crane for counter weight protection. The barricades performed efficiently and provided improved protection to personnel. The inspectors interviewed the oiler and determined the worker had an easier time of safely roping off the danger area with the installed barricades.

### Fall Protection

The inspectors reviewed the site fall protection program against the general requirements of 29 CFR 1926, Sub-part M, and the specific requirements within 29 CFR 1926, (d)(16) which required fall arrest systems, when stopping a fall, will:

- a. Be rigged to keep a person from free falling over 6 feet or contacting a lower level.
- b. Limit the arresting force to a person in a harness to 1,800 pounds.
- c. Bring a person to a complete stop with a maximum deceleration distance of 3.5 feet.

The inspectors reviewed the technical literature provided by the single vendor providing all fall arrest systems for the Contractor. Based upon the Contractor's past use of the vendor's six-foot lanyards and harness systems, the inspectors determined (in some specific instances) personnel who donned this type of ensemble would not have been protected in accordance with the above cited requirements as they would have (based upon vendor technical data) contacted a lower level before the ensemble would have had a chance to fully arrest the fall.

The inspectors re-visited the Contractor's fall protection training class. 29 CFR 1926.503 required all applicable elements of 29 CFR, Subpart M, be addressed in the training. However, the inspectors determined the technical limitations and capabilities of the existing fall arrest systems were not discussed. The Contractor was in the process of re-evaluating the entire fall restraint program during the inspection period.

Lifelines were inspected at the PTF and were determined to conform to the requirements of 29 CFR 1926.500.

The inspectors noted a double six-foot lanyard, with pelican hooks, had been discarded on the dirt near the HLW. The inspectors retrieved the lanyards to check whether it had possibly been "fallen through". Based upon the inspection, the equipment was in sound operating condition. The inspectors handed the equipment to the foreman at the site and requested that it be formally returned to the equipment shed for inspection and proper disposition.

On two consecutive occasions the inspectors noted CB&I rigging subcontractor employees were working on the top of a heavy lift crane cab 12 feet above ground and ~8 feet above the track without fall protection. On both occasions, the inspectors promptly notified the BOF safety engineer for resolution. The inspectors were informed by the Contractor's safety engineer that the non-conforming practice with the sub-tier subcontractor had been resolved and they were subsequently conforming to the requirements of the Contractor's HSP. The inspectors had not identified similar occurrences during subsequent visits to this area of the project.

On one occasion a worker on the catwalk of the concrete creter crane, approximately 12' off the ground, was not tied off. The inspectors notified the safety engineer for PTF and the situation was corrected on the spot and the worker was then in conformance with the Contractor's procedures.

The Contractor notified the inspectors they intended to procure structural steel members with shear connectors installed at the manufacturer's facility instead of assembling them in the field. The installation of the fabricated studs would normally be determined a violation of 29 CFR 1926.754. The requirement stated no exposed studs would be exposed to walking surfaces on any beams. The regulation allowed construction contractors to install them in the field in order to minimize the tripping hazard to workers. However, based upon OSHA's interpretation of the regulation they would only cite the contractor if they used prefabricated studs in beams, if fall protection was not used. However, OSHA would provide a de minimus notation in their inspection report even with 100% fall protection. The Contractor's fall protection procedure is clear and uncomplicated. The Contractor informed the inspectors, that upon installation of the pre-fabricated studded beams, they would enforce the 100% fall protection. Therefore, ORP considered the Contractor's plan to preinstall the shear connectors and implement a 100% fall protection program during structural steel installation to meet or exceed the level of protection provided by the requirement of 29 CFR 1926.754.

The inspectors reviewed the fall restraint equipment at the issue tool cribs for the PTF and the LAW. The inspectors determined the tool crib employees knew the limitations and capabilities of the various equipment in stock. However, they varied in their approach in terms of how they dispositioned equipment that was returned to the crib. Personnel in one crib self-inspected all equipment and if they questioned the capability, would send the material to the warehouse for destruction. The other crib personnel sent all returned equipment to the warehouse for inspection prior to re-stocking it. It was determined in both cases the returned fall protection equipment was fully inspected prior to disposition. The personnel were found to be conforming to the Contractor's procedures.

The inspectors concluded the Contractor was, in some cases, not following the specifications for use of the fall restraint systems and thus, was not conforming to the requirements of 29 CFR Subpart M. Further the competent person was not including training related to the limitations and capabilities of the equipment issued on site. These issues will be tracked as assessment follow-up item A-03-OSR-RPPWTP-010-A04 pending validation the Contractor conforms to the requirements of 29 CFR 1926 subpart M.

### Balance of Facilities

The inspectors inspected the new vehicle shop and the sprinkler system over the Combo shop compressor.

The inspectors determined the new vehicle shop was being constructed under the requirements of the National Fire Protection Association (NFPA) 70-2002, (Table 514.3(B)(1)) as a Class 1 Division 2 facility. Based upon anticipated use of the facility, the classification was determined to conform to the NFPA requirements. The classification required the Contractor to provide for 6 air changes per hour during all times the facility was in operation, occupied, or had a vehicle parked within. The inspectors discussed the mandatory ventilation required with this building classification and the Contractor understood the requirements and planned to provide the necessary ventilation systems.

The inspectors inspected the sprinkler system located above the combo shop compressors and determined the system was in conformance with NFPA 13.

### 13.8 KV Manhole #24

The inspectors observed the cover for manhole #24 opened and a ladder installed for entering the manhole. No one was working at the time in this manhole. 29 CFR 1926.956(a)(1) requires appropriate warning signs be promptly placed when covers of manholes, handholes, or vaults are removed. The manhole did not have a barricade or warning sign.

The inspectors discussed this safety concern with the Contractor. The Contractor subsequently rope off the entrance to the manhole and installed a "Danger High Voltage – Keep Out" sign. This resolves this issue.

The following day the inspectors observed the Contractor performing work, over and around exposed energized 13.8 KV conductors lying on the bottom of the manhole floor. The Contractor had used a rotor hammer and various other tools to knockout the manhole drain.

The Contractor's Job Hazard Analysis (JHA) requirements defined in 24590-WTP-GPP-SIND-002, "*STARRT/JHA Procedure*", Revision 1, dated November 4, 2002, Section 3.3.2 stated: "All potential hazards within each step or activity are identified. Input should be solicited from multi-disciplinary professional staff for hazard evaluation. This input should include safety, industrial hygiene, health physics, field engineering, and the crafts involved."

Contrary to the above, the Contractor had not identified on the JHA, the possible hazard of working over & around energized cables in the manholes. The JHA used in the field, for performing the work, did not have the required signatures from the Responsible Supervisor or Environmental, Safety, and Health Representative.

The inspectors discussed this issue with the Contractor's Safety Department and the Contractor subsequently issued a revised JHA to add, "All cables shall be protected from damage while working in the vault. This can be achieved by moving the cables from the work area or installing barriers". This resolves this issue.



Injury Investigation:

The inspectors attended a Contractor's root cause analysis and mitigation meeting regarding an injury to an employee who had fallen onto a rebar mat within the PT area. The Contractor had made tentative recommendations to dedicate more labor to walkway development and maintenance. The inspectors reviewed the Contractor's incident report and determined the Contractor had not transferred some of the positive applied attributes (walking surfaces) regarding rebar mat decking from the LAW operations to the PTF prior to the accident. The PTF had diligently gained information from the other facilities during the investigation and applied it where applicable and feasible. The prompt medical attention and careful evacuation of the injured worker was noteworthy. The steps that the PTF has taken to minimize recurrence of this type of injury were appropriate. This event is further discussed in Section 1.11.8 below.

**1.10.3 Conclusions**

Revision 1 of the Contractor's Health and Safety Plan changed the requirement for Lockout/Tagout from 29 CFR 1926 to 29 CFR 1910.147. The Contractor currently does not comply 29 CFR 1910.147 which is a general industry standard not intended for construction. The Contractor intends to revise the Health and Safety Plan to address this issue.

A formal variance required by ORP M440-1.2 is needed to address tower crane transition zone ladder way noncompliances.

The inspectors concluded, with the exception of the issues described above and seven minor instances, the Contractor had acceptably implemented the program for industrial health and safety. Identified minor discrepant conditions were promptly and acceptably corrected and the inspectors determined the Contractor had met the applicable requirements of ORP M 440.1-2.

**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 item, the corrective actions, and other information provided. The inspectors verified by records review the corrective actions stated were appropriately completed.

**1.11.1 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-006-A04)** The Contractor had installed a panelboard labeled 480/277 volt three phase four-wire in an application that required a 480 volt three phase three-wire panelboard.

The Contractor labeled the panelboard "480 volt, three phase, three wire". This resolved this issue.

**1.11.2 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-006-A05)** Follow-up on Contractor efforts to resolve NEC violations associated with LAW Temporary Power. During

inspection period December 5, 2002, through January 24, 2003, the inspectors identified two electrical code deficiencies pertaining to LAW temporary power; the following items have been reviewed as stated below:

**(A-03-OSR-RPPWTP-006-A05a)** The Contractor had not connected the equipment-grounding conductor to the grounding electrode at the 400 amp South #1 Disconnect Switch located in the south LAW area, as required by NEC-1999, Article 250-32(b)(1).

During this inspection period, the Contractor installed the grounding electrode conductor connecting the equipment grounding conductor to the grounding electrode at the 400 amp disconnect, meeting the above requirements; the inspectors verified the correction. This resolved this issue.

**(A-03-OSR-RPPWTP-006-A05b)** The Contractor had not sized the conduit body (LB) properly to meet NEC-1999, Article 370-28 requirements at the 400 amp South #1 Disconnect Switch located in the south LAW area.

The Contractor replaced the conduit body (LB) with a larger pulling LB meeting the requirements stated above. The inspectors verified the correction. This resolved this issue.

Based upon the above, A-03-OSR-RPPWTP-006-A05 is closed.

**1.11.3 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-006-A06)** The Contractor had buried flexible cord (type SEOOW) installed for the High Mast Lighting at the north end of T1 Building, this did not conform to the requirements of NEC-1999, Article 400-6.

The Contractor removed the cable from the earth and installed a wood protector for this cable. This resolved this issue.

**1.11.4 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-008-A05)** The Contractor had installed flexible cord routed through a wood protector and then buried underneath the roadway, not meeting the requirements of NEC Article 400.6, 400.7 & 300.5.

The Contractor removed the flexible cord and the inspectors verified the correction. This resolved this issue.

**1.11.5 (Closed Assessment Follow-up Item A-03-OSR-RPPWTP-008-A07)** The Contractor had not installed strain relief on vertical connection of cables through boots into junction or other electrical boxes. This was necessary to prevent tension from being transmitted to terminals (NFPA 70 Article 400.10).

The Contractor supported the cables to meet the above requirement. This resolved this issue.

**1.11.6 (Closed Occurrence Report RP-BNRP-RPPWTP-2003-0001)** Benton County Clean Air Authority dust control violation at the Marshalling yard.

In preparation for continued construction of the Waste Treatment Plant, a lay down yard was under construction at the North Marshalling Yard. A subcontractor completed clearing, grubbing, and roadways work on November 18, 2002. The Marshalling Yard had a Dust Control Plan that was implemented during the previous summer and called for use of a water truck in the North Marshalling Yard.

On February 21, 2003, a call was received from the Benton County Clean Air Authority advising the Contractor the North Marshalling Yard was in violation for excessive dust. A second water truck was added to control dust. The trucks performed watering operations during the Contractor's standard 4 day-10 hour per week (Monday-Thursday) work shift.

On March 7 and 8, 2003, dust control was again lost due to high winds (40-55 mph gusts). A second call was received from the Air Authority about excessive dust. Construction management then initiated a 7 day-24 hour per week work schedule until a permanent method of controlling the dust was initiated. The 4000 and 6000 gallon water trucks were capable of putting down approximately 150,000 gallons of water per shift.

Bids were submitted for hydro seeding of the lay down yard. On March 18, 2003, a hydro-seeding subcontractor was selected and mobilized onsite. Hydro seeding was expected to take 7-10 days with several weeks of watering thereafter to allow vegetation growth to establish dust control.

A formal Notice of Violation was issued by the Benton County Clean Air Authority on March 17, 2003, for inadequate dust control.

The root cause of this incident was inadequate work organization and a planning deficiency. Although the Contractor developed a dust control plan, it was not adequate to control the conditions that eventually developed. The plan called for the use of a water truck to suppress dust during grubbing and leveling operations by a subcontractor. Under normal conditions a single water truck may have been adequate. However, planning was inadequate and human error (contributing cause) occurred in that management providing oversight of this project was unaware of the extreme wind and dust conditions that may occur in this region. Plans had not been made to deal with the conditions that occurred. Even with 3 water trucks working 24 hours/day and 7 days/week, the dust could not be controlled under some high wind conditions.

A contributing factor was the plan had originally specified a cost estimate to lay gravel down on the 130 acre sight once it had been leveled. Other methods to cover the lay-down yard were not considered (e.g., hydro seeding). Due to the \$500,000 cost estimate to lay gravel, management made a decision not to spend this money. The Contractor felt, once material came into the yard and was laid down, dust issues would not be a significant factor. Due to a delay in procurement, materials were not purchased and brought in during the expected time frame, leaving the lay-down yard bare.

The Contractor's corrective actions resulting from the above incident, as documented in the occurrence report were as follows:

- Prepare a response letter to the Notice of Violation and deliver it to the Benton Clean Air Authority with proposed actions to correct the fugitive dust emissions.
- Select a subcontractor to conduct hydro seeding over the 130 acre lay down yard. Complete the seeding process.
- Responsible managers to discuss and evaluate the inadequacies of the planning process as it related to this incident. A revised dust control plan will be developed from this process.

All corrective actions have been completed and the inspectors determined this item was satisfactorily closed.

**1.11.7 (Open Occurrence Report RP-BNRP-RPPWTP-2003-0002)** Near-miss associated with HVAC Filter change out at the T-1 building. On March 12, 2003, sheet metal workers were assigned to conduct a Preventive Maintenance (PM) activity on the Heating, Ventilation, and Air Conditioning (HVAC) units of the T-1 office building. During the pre-job meeting the workers were directed to use the HVAC manufacturer's breakers to de-energize the unit instead of a site disconnect located next to the unit. The site disconnect also supplied power to a smoke sensor circuit for the HVAC unit. A loss of power to the smoke detector would activate the alarm at the fire station, resulting in the dispatch of a fire truck with fire fighters.

The sheet metal workers opened the manufacturer's breakers to isolate the unit as instructed. While performing the PM a worker vacuuming the unit with a metal vacuum wand contacted a 277 Volts energized wire on the oil heater resulting in an arc flash and a "pop type sound". The PM activity was stopped and an investigation of the incident was started.

One week after the incident a DOE inspector reviewed the investigation report and informed the Contractor the incident met the reporting requirements of DOE O 232.1A. The Contractor had not evaluated the incident for reportability. Subsequently the Contractor evaluated the incident and declared an occurrence (near miss) and began conducting a root cause analysis of the incident.

A Contractor investigation of the event was documented in 24590-WTP-RPT-CON-03-002, Revision 0, *Root Cause Analysis for HVAC Incident*, dated April 22, 2003. The root cause was found to be a deficiency in management controls in place to administer and direct work activities regarding JHA and Lockout/Tagout. The Contractor's corrective actions resulting from the above incident, as documented in the root cause analysis are as follows:

- Construction Management to provide additional training on the use of JHA in order to:
  - Ensure the roles and responsibilities of the Supervisor and Safety Representatives are clearly identified in the training.
  - Ensure the level of required detail during the analysis of the hazards is clearly identified in the training.

- Construction Management to modify the Lockout/Tagout procedure to clarify the requirement for a temporary request to be formally requested and issued prior to allowing anyone to use individual qualified equipment control procedure (IQECP) method or any other method of Lockout/Tagout.
  - Construction Management to modify Lockout/Tagout procedure to provide the following:
    - Include limitations as to the use of the IQECP section of the procedure.
    - Provide the required qualifications for personnel performing the work under the IQECP.
    - Provide a document describing how to handle repetitive tasks or maintenance on operating equipment (temporary buildings).
  - Construction Management to provide additional training on the above changes to the Lockout/Tagout procedure.
  - Construction Management is to perform an independent assessment of the Lockout/Tagout and JHA procedures to ensure implementation of the above.
  - Construction Management will add the Lockout/Tagout procedure to all applicable manual employee-training profiles.
  - Construction Management to add Lockout/Tagout procedure to all applicable field engineer-training profiles.
  - Use the external disconnect for all future PM on the HVAC units and alert Hanford Fire Department when shutdowns are required.
  - Construction Management to determine method to emphasize all crafts must be supervised by appropriate personnel.
  - Perform a detailed hazard analysis as required by JHA procedure. Use the main power disconnect as required by the applicable operations and maintenance manual.
  - Review all isolation with the Lockout/Tagout administrator. Formally request a lockout/tagout number and written instructions. The inspectors reviewed this incident in light of the core functions of Integrated Safety Management System (ISMS). The objective of ISMS is to incorporate safety into management and work practices at all levels, addressing all types of work and all types of hazards to ensure safety for the workers, the public, and the environment. The failures in the work activities are listed below arranged by the ISMS core function.
1. **ISMS Core Function: Define the scope of the work: The work documents did not adequately define the scope of the work.**

It is important the work scope be defined and well understood by all people involved in the activity. A one-page work card was given to the workers assigned to do the PM in question. The work card did not address the full scope of the work activity. The work card directed the workers to change the air filters, check the oil level, and perform a visual inspection of the equipment. The workers also vacuumed dust out of the unit. The Contractor stated some activities (like vacuuming) are "skill of the craft" and thus did not have to be specified on the work card. However, problems can occur when un-defined work scope introduces new hazards. The workers were vacuuming in a close proximity to the exposed fan blades. When the manufacturer's breakers were de-energized, the oil heater and cooling fan circuit were still energized. The cooling fan circuit contained a thermostat controller, which had it reached the set point temperature, would have automatically started the fan. The vacuum wand probably damaged the live wires resulting in the arcing.

**2. ISMS Core Function: Identify and analyze hazards: The hazards were not adequately identified and analyzed for this PM activity.**

When the workers were assigned to perform the PM activity, the only hazards identified to them were contained in a JHA. The JHA identified general hazards from out door work, rigging, and electrical shock. These hazards were not connected to specific work activities of the PM because the work scope was vague. This PM did not include any activity that could include rigging, but the hazard was listed. The mechanical hazard for the fan blade starting while a worker was cleaning the fan and general area was not addressed. The electrical shock hazard listed in the JHA referred the workers to the Lockout/Tagout procedure but did not direct whether one was required or not. The JHA was not reviewed or approved by the safety organization. The JHA was used to develop a briefing card called a Safety Task Analysis Risk Reduction Talk (STARRT) card used to brief the workers. The STARRT Card indicated the electrical source was locked out and tagged out and disconnected.

**3. ISMS Core Function: Develop and implement hazard controls: The controls developed and implemented were inadequate.**

Because the Lockout/Tagout Authority was never asked to provide a Lockout/Tagout and thus never examined the HVAC wiring diagrams, a component person did not evaluate the method used by the workers to protect them from electrical shock. When the manufacturer's breakers were de-energized, the oil heater and cooling fan circuit were still energized. The cooling fan circuit contained a thermostat controller, which had it reached the set point temperature, would have automatically started the fan. The workers were vacuuming in a close proximity to the exposed fan blades. The direction to use the manufacturer's breakers to de-energize the unit was based on an informal discussion with the Lockout/Tagout Authority who thought they were discussing a different HVAC unit. No discussion took place about controlling the mechanical hazards from the fan; only electrical hazards were discussed with the Lockout/Tagout Authority. The Lockout/Tagout Authority should have reviewed and approve the process to de-energize equipment. The approval process should have included a walk down of the equipment. Furthermore, the manufacture's manual contained a warning to turn off the main power before performing service or maintenance to prevent injury. This warning was not used when developing the hazard controls for this PM activity.

This item will remain open until the Contractor has completed their corrective actions.

**1.11.8 (Closed Occurrence Report RP-BNRP-RPPWTP-2003-0003)** Carpenter injury due to slip at the PTF rebar mat. On April 1, 2003, a 60-year-old carpenter foreman slipped on the PTF rebar mat. The foreman was in the process of walking over to direct his crew on installing batter boards located in the corner of the basemat area. To access this area of the basemat, the employee had stepped off of the plywood walkway used as general access to the main area of the rebar basemat. His right foot slipped through the rebar and, as he attempted to pull his foot up, the heel caught on other rebar within the mat. As he fell forward his fore leg contacted other rebar causing the injury. The employee was stabilized on the surface of the rebar mat prior to transport to the onsite medical facility. The medical personnel took x-rays. Once a hairline fracture was identified, an ambulance was called to transport the employee to the Hospital for further evaluation and treatment. Due to a contusion directly above the fracture, the hospital medical staff was concerned over the possibility of infection and held the employee over for 24-hour observation and given intravenous antibiotics to guard against infection.

The root cause and direct cause are both found to be human error and inattention to the hazards of the walking/working surface. The rebar mat on the PTF construction project was extensive and constantly changing. Wooden walkways were placed to provide general access but did not cover the entire mat surface. Workers must exercise caution and maintain a high level of awareness when walking across the rebar mat. The injured worker in this incident was a foreman with significant experience accessing and working on rebar mats. His attention was diverted from where he was placing his feet to his effort to instruct his crew working with the batter board layout.

The Contractor's corrective actions resulting from the above incident, as documented in the occurrence report are as follows:

- STARRT card meetings were used to reinforce the need to continually evaluate the hazards associated with carrying out work particularly on the top mat and to take the appropriate actions to provide a safe working environment.
- The work practice of establishing walkways on the mat for general access around the building was reinforced. Workers are to be reminded of the need to use these walk ways and where work has to be carried out off the walkway, work stations are to be established as necessary. When walking on the rebar mat, workers must pay attention and take care.
- A crew was dedicated to install and maintain access and walkways.
- Notices were posted at the access ways onto the basemat top mat to remind workers of the hazards associated with working on the top mat and the need to use established walkways for general access.
- A review of the project experience was conducted to identify improvements that can be introduced to the work practice.

The experience gained on the High Liquid Waste and the LAW work locations was used to identify any opportunities for improvement. A site visit from personnel working in both of those areas was conducted.

All corrective actions have been completed and the inspectors determined this item was satisfactorily closed.

## **2.0 EXIT MEETING SUMMARY**

The inspectors presented preliminary inspection results to members of Contractor management at an exit meeting on April 21, 2003. The Contractor acknowledged the observations and conclusions. During the exit briefing, the Construction Manager provided a copy of the concrete suppliers written Assured Grounding Program and implied this program had been implemented before our inspectors inspected the subcontractor. Subsequently, the inspectors verified the written program had been issued after the inspection and as a direct result of the issue raised (documented in Section 1.9.2, subsection "Batch Plant – Assured Grounding Program"). This information was later shared with the Construction Manager.

The inspectors asked the Contractor whether any materials examined during the inspection should be considered limited rights data. The Contractor stated no limited rights data were examined during the inspection.

## **3.0 REPORT BACKGROUND INFORMATION**

### **3.1 Partial List of Persons Contacted**

W. Buckner, BNI Radiological Control Technician  
 T. Callahan, Lead CBI Radiographer  
 C. Davis, Safety Assurance Manager  
 J. Dougherty, Site Manager  
 M. Ensminger, Quality Control Supervisor  
 R. Grimsley, CB&I Project Welding and QA/QC Manager  
 S. Henry, BNI Radiological Operations Lead  
 T. Horst, Construction Manager  
 G. McClain, General Superintendent  
 R. Naventi, Project Director  
 T. Robison, CB&I Welding and QC Supervisor  
 L. Rumsey, CBI Safety Manager  
 G. Shell, Quality Assurance Manager  
 E. Smith, Safety Programs  
 B. Spezialetti, Regulatory Safety Manager  
 R. Tosetti, Manager of Engineering

### **3.2 List of Inspection Procedures Used**

Inspection Administrative Procedure A-105, "Inspection Performance"



Inspection Administrative Procedure I-106, " Verification of Corrective Actions"

Inspection Technical Procedure I-111, "ALARA Program Assessment"

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-OSR-RPPWTP-010-F01a | Finding                      | Failure to obtain Engineering approval to cut reinforcement steel (Placement LAW-0026) to support construction of a block-out in the east curb wall. (Section 1.3.2)               |
| A-03-OSR-RPPWTP-010-F01b | Finding                      | Failure to install reinforcement steel (Placement LAW-0009) in accordance with drawings (missing two rebar). (Section 1.3.2)   |
| A-03-OSR-RPPWTP-010-F01c | Finding                      | Failure to cold bend number 9 rebar in LAW in accordance with procedure (did not preheat bar). (Section 1.3.2)   |
| A-03-OSR-RPPWTP-010-F01d | Finding                      | Failure to complete pour cards in accordance with procedures. (Section 1.3.2)  |
| A-03-OSR-RPPWTP-010-A02  | Assessment<br>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 1.10.2) |

|                          |                              |   |
|--------------------------|------------------------------|---|
| A-03-OSR-RPPWTP-010-A03  | Assessment<br>Follow-up Item | Follow-up on the Contractor's actions to request a variance to address noncompliance regarding ladder ways associated with tower crane transition point. (Section 1.10.2) |
| A-03-OSR-RPPWTP-010-A04  | Assessment<br>Follow-up Item | Follow-up on the Contractor's actions to address issues regarding fall protection required by 29 CFR 1926 subpart M (Section 1.10.2)                                      |
| RP-BNRP-RPPWTP-2003-0002 | Occurrence<br>Report         | Near-miss associated with HVAC Filter change out at the T-1 building. (Section 1.11.7)  |
| <u>Closed</u>            |                              |   |
| A-03-OSR-RPPWTP-006-A04  | Assessment<br>Follow-up Item | Follow-up on Contractor efforts to resolve NEC noncompliances associated with HLW Temporary Power. (Section 1.11.1)   |
| A-03-OSR-RPPWTP-006-A05  | Assessment<br>Follow-up Item | Follow-up on Contractor efforts to resolve NEC noncompliances associated with LAW Temporary Power. (Section 1.11.2)   |
| A-03-OSR-RPPWTP-006-A06  | Assessment<br>Follow-up Item | Follow-up on Contractor efforts to resolve a NEC noncompliance associated with High Mast Lighting. (Section 1.11.3)   |
| A-03-OSR-RPPWTP-008-A05  | Assessment<br>Follow-up Item | Follow-up of Contractor's action to address in appropriate direct burial of a 50 amp 240 volt flexible cable on the east side of the PTF facility. (Section 1.11.4)       |
| A-03-OSR-RPPWTP-008-A07  | Assessment<br>Follow-up Item | Follow-up of Contractor's action to address the need to add strain relief for the Potain tower crane vertical cables. (Section 1.11.5)                                    |
| RP-BNRP-RPPWTP-2003-0001 | Occurrence<br>Report         | Benton County Clean Air Authority dust control violation at the Marshalling yard. (Section 1.11.6)  |
| RP-BNRP-RPPWTP-2003-0003 | Occurrence<br>Report         | Carpenter injury due to slip at the PTF rebar mat. (Section 1.11.8)   |

Partially Closed

None.

Discussed

|                         |                              |  |
|-------------------------|------------------------------|--|
| A-03-OSR-RPPWTP-003-A02 | Assessment<br>Follow-up Item | Determine if the Contactor has improved its process to ensure radiation exposure associated with radiography operations is maintained ALARA. (Section 1.7.2) |
| A-03-OSR-RPPWTP-006-A02 | Assessment<br>Follow-up Item | Follow-up on Contractor efforts to resolve OSHA concerns associated with the Potain Tower crane. (Section 1.10.2)  |
| A-03-OSR-RPPWTP-008-A06 | Assessment<br>Follow-up Item | Follow-up of Contractor's action to implement an adequate assured grounding program. (Section 1.9.2)   |

**3.4 List of Acronyms**

|       |  |
|-------|--|
| AB    | authorization basis                              |
| ALARA | as low as reasonable achievable                  |
| ASME  | American Society of Mechanical Engineers         |
| ASTM  | American Society for Testing and Material        |
| BOF   | balance-of-facilities                            |
| BOP   | Balance of Plant                                 |
| B&PV  | boiler and pressure vessel                       |
| CB&I  | Chicago Bridge and Iron                          |
| DOE   | U.S. Department of Energy                        |
| GFCI  | ground fault circuit interrupter                 |
| HLW   | High Level Waste                                 |
| HSP   | Nonradiological Worker Safety and Health Plan    |
| HVAC  | Heating, Ventilation, and Air Conditioning       |
| IH&S  | Industrial Health and Safety                     |
| IQEC  | individual qualified equipment control procedure |
| ISMS  | Integrated Safety Management System              |
| ITP   | Inspection Technical Procedure                   |
| ITS   | important-to-safety                              |
| JHA   | Job Hazards Analyses                             |
| LAW   | Low Activity Waste                               |
| NCR   | Nonconformance Report                            |
| NEC   | National Electric Code                           |

|        |   |
|--------|---|
| NFPA   | National Fire Protection Association          |
| ORP    | Office of River Protection                    |
| OSHA   | Occupational Safety and Health Administration |
| PM     | preventive maintenance                        |
| PTF    | Pretreatment Facility                         |
| PVC    | Polyvinyl Chloride                            |
| QAM    | Quality Assurance Manual                      |
| QC     | quality control                               |
| RCT    | Radiological Control Technician               |
| ROL    | Radiological Operations Lead                  |
| SRD    | Safety Requirements Document                  |
| STARRT | Safety Task Analyses Risk Reduction talk      |
| TUV    | TUV Rheinland, Inc.                           |