U.S. Department of Energy
[redacted]
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

07-WTP-279

OCT 05 2007

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

Dear Mr. Albert:

CONTRACT NO. DE-AC27-01RV14136 – INSPECTION REPORT A-07-AMWTP-RPPWTP-003 – ON-LOCATION INSPECTION REPORT FOR THE PERIOD JULY 1, 2007 THROUGH SEPTEMBER 30, 2007

This letter forwards the results of the U.S. Department of Energy (DOE), Office of River Protection (ORP) review of Bechtel National, Inc. (BNI) construction performance of the Waste Treatment and Immobilization Plant for the period July 1, 2007 through September 30, 2007. A summary of the inspections is documented in the attached Inspection Report A-07-AMWTP-RPPWTP-003 (Attachment 2).

The attached Notice of Finding (Attachment 1) documents six Findings that require BNI response. These Findings include failure to: 1) Include in Substation 2-circuit 17, equipment grounding conductors with three sets of four 600 kcmil conductors; 2) Perform required subcontractor safety and health program field assessments; 3) Produce a documented Occurrence Report 2006-0018 accident investigation; 4) Adequately perform an extent-of-condition and implement and verify corrective actions for permanent plant single line diagram conductor/overcurrent device trip setting changes; 5) Verify that it was safe to energize Substation 9 following a ground fault trip; and 6) Track the corrective action for Occurrence Report 2007-0006. Also, four additional examples were identified where BNI failed to issue final occurrence reports within the time limits specified in DOE M 231.1-2 required in Section C.6, Standard 1(f)(3) of the BNI Contract. This issue will continue to be tracked under the Finding identified in inspection report A-07-AMWTP-RPPWTP-001.

Two supplier related issues were identified during a supplier inspection, they are currently being reviewed by ORP Quality Assurance assessors for potential Findings. These issues regard the procurement of the High Level Waste Facility High Efficiency Moisture Eliminator Tanks and concern the manner in which the supplier commercial grade dedicated quality-related ring beam material, and the lack of quality and technical requirements specified for BNI directed supplier procurement of quality related internal components (filters, filter housings, and filter internal structure/installation guides). The results of this review will be provided to BNI at a later date.

In addition, during an annual Job Hazard Analysis (JHA) program review, BNI's JHA program was found to not be fully effective at communicating and implementing worker hazard awareness (inspection note A-07-AMWTP-RPPWTP-003-77). Similar issues were raised during the last two annual program reviews and not adequately addressed. Within 30 days of receipt of this letter, BNI is requested to provide its assessment of this area and describe any corrective actions planned to address this important worker safety area.

This letter is not considered to constitute a change to the Contract. In the event BNI disagrees with this interpretation, it must immediately notify the Contracting Officer orally, and otherwise comply with the requirements of the Contract clause entitled 52.243-7 Notification of Changes.

If you have any questions, please contact me, (509) 376-3681.

Sincerely,

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

WTP:JWM

Attachments (2):

cc w/attachs:
D. Jantosik, BNI
D. Kammenzind, BNI
BNI Correspondence

NOTICE OF FINDING

Section C, "Statement of Work," Standard 7, "Environment, Safety, Quality, and Health," of the Waste Treatment and Immobilization Plant (WTP) Contract DE-AC27-01RV14136, dated December 2005, between the U.S. Department of Energy (DOE), Office of River Protection (ORP) and Bechtel National, Inc. (BNI), defines BNI's responsibilities as they relate to conventional nonradiological worker safety and health; radiological, nuclear, and process safety; environmental protection; and quality assurance.

Standard 7, Section (e)(3) of the Contract requires BNI to develop and implement a Quality Assurance (QA) program, supported by the documentation that describes the overall implementation of QA requirements. The documentation shall identify the procedures, instructions, and manuals used to implement BNI's QA program within BNI's scope of work. For radiological, nuclear, and process safety, QA is to be conducted in accordance with Title 10 *Code of Federal Regulations* (CFR) Part 830 Sub-Part A[1]. BNI's QA program is documented in 24590-WTP-QAM-QA-01-001, *Quality Assurance Manual (QAM)*, dated October 31, 2006.

Section C.7(f) of the Contract requires BNI to design and construct the WTP in accordance the National Electrical Code (NEC) and the National Fire Protection Association (NFPA) fire protection code.

Section C, Standard 7, Section (e)(1)(ii) of the Contract required the Contractor's non-radiological worker safety and health program to conform to the DOE regulatory program described in RL/REG-2000-04, *Industrial Health and Safety Oversight Plan.*

Section C.6, Standard 1(f)(4) of the Contract requires BNI to meet the requirements of DOE Manual 231.1, *Environmental, Safety and Health Reporting.*

While performing assessments of BNI's construction activities, conducted from July 1, 2007 through September 30, 2007, ORP identified the following Findings:

1. Article 250-30(b): For a grounded system at the separate building or structure, the connection to the grounding electrode and grounding or bonding of equipment, structures, or frames required to be grounded or bonded shall comply with either (1) or (2) below:

   (1) An equipment grounding conductor as described in Section 250-118 shall be run with the supply conductors and connected to the building or structure disconnecting means and to the grounding electrode(s). The equipment grounding conductor shall be used for grounding or bonding of equipment, structures, or frames required to be grounded or bonded.

   (2) Where (1) an equipment grounding conductor is not run with the supply to the building or structure, and (2) there are no continuous metallic paths

[1] 10 CFR 830, "Nuclear Safety Management;" 10 CFR 830 Sub-Part A, "Quality Assurance Requirements"

bonded to the grounding system in both buildings or structures involved, and (3) ground-fault protection of equipment has not been installed on the common ac service, the grounded circuit conductor run with the supply to the building or structure shall be connected to the building or structure disconnecting means and to the grounding electrode(s) and shall be used for grounding or bonding of equipment structures, or frames required to be grounded or bonded.

Contrary to the above, Substation 2-circuit 17 (1200-amp) consists of three sets of four 600 kcmil conductors with no equipment grounding conductors. The neutral (grounded) conductor was grounded/bonded at both Substation 2 Switchgear and again at the Warehouse T-52 Main Distribution Panelboard. The 2000 amp main breaker at Substation 2 had ground fault protection. Therefore, the code requires an equipment grounding conductor to be run with the supply conductors. Failure to ensure temporary power feeder routed from Substation 2 to the T-52 Warehouse Main Distribution Panelboard complied with requirements specified in Section C.7(f) of the Contract (requirement to comply with National Electrical Code), is considered a Finding (**A-07-AMWTP-RPPWTP-003-F01).** (Inspection Note 003-01)

2. *Nonradiological Worker Safety and Health Plan*, 24590-WTP-PL-IS-01-001, Rev. 5, Paragraph 2.3, 1st bullet required the Safety Assurance Management Program to include periodic field assessments of subcontractors' performance relative to compliance with the *Nonradiological Worker Safety and Health Plan.*

   Contrary to the above, Safety Assurance Representatives' were conducting desktop-like reviews of subcontractors' safety and health programs without performing field assessments of the subcontractors' compliance with the requirements of BNI's Nonradiological Worker Safety and Health Plan (Finding **A-07-AMWTP-RPPWTP-003-F05**). (Inspection Note 003-06)

3. BNI Quality Assurance Manual, Sections 3.6.1, states in part, "Responsible management shall perform investigative action to determine the extent of the adverse conditions and complete remedial action as soon as practical," and Section 3.6.2 states in part, "Conditions adverse to safety and health shall be documented…"

   Contrary to the above, BNI was unable to supply objective evidence regarding the event investigation (BNI Accident Investigation Report) associated with occurrence report EM-RP--BNRP-RPPWTP-2006-0018 *LOTO Procedure Violation,* or that the corrective action was completed (Finding **A-07-AMWTP-RPPWTP-003-F07)**. (Inspection Note 003-12)

4. Quality Assurance Manual Policy Q-16.1, Section 3.1.1.B states that Conditions Adverse to Quality shall be identified promptly and correct as soon as practical. Section 3.1.1.E states follow-up actions shall be taken to verify implementation of corrective actions.

Contrary to the above, BNI failed to implement and verify implementation of corrective actions stated in Project Issues Evaluation Report (PIER) #24590-WTP-PIER-MGT-07-0263. This PIER stated BNI would revise the Cable Ampacity Calculation 24590-WTP-E1C-LVE-0001 to adopt NEC Table 310-16 for sizing cable conductors. After they issued the calculation, the PIER directed BNI to perform a review of the issued for construction (IFC) single line diagrams and validate the power conductor sizes against the revised calculation and the respective overcurrent device setting. Multiple examples of wrong overcurrent device trip settings were identified for the conductors called out on the single line diagrams. In addition, additional drawings, not identified during the PIER extent-of-condition review, were found to contain wrong overcurrent device trip settings.

Failure to adequately implement and verify the corrective actions, including extent of condition in PIER #24590-WTP-PIER-MGT-07-0263 is a Finding for failure to implement Quality Assurance Manual Policy Q-16.1 Section 3 (**Finding A-07-AMWTP-RPPWTP-003-F11**). (Inspection Note 003-49)

5. NFPA 70E, Article 130.6 states after a circuit is de-energized by a circuit protective device, the circuit shall not be manually re-energized until it has been determined that the equipment and circuit can be safely energized. When it is determined the automatic operation of the device was caused by an overload rather than a fault condition, examination of the circuit or connected equipment shall not be required before the circuit is re-energized.

   Contrary to the above, after Substation 9 tripped on indication of a ground fault, on August 6, 2007, BNI re-energized the Substation 9 before ensuring Substation 9 circuits were safe to energize. This is a Finding against Contract requirement Section C, Part C.7, *Facility Specification*, item (f) regarding the requirement to follow NFPA-70E requirements (**Finding A-07-AMWTP-RPPWTP-003-F12).** (Inspection Note 003-39)

6. DOE M 231.1-2, Paragraph 5.6.f states in part, "As prescribed on the Occurrence Reporting Model (Section 11) and depending on the Significance Category, the Facility Manager must track all corrective actions to closure…"

   Contrary to the above, Occurrence Report EM-RP-BNRP-RPPWTP-2007-0006, *Occupational Injury – Broken Right Heel Bone* identified one corrective action to revise the Job Hazards Analysis (JHA) to include evaluating the use of an alternate work platform. However, the corrective action to revise the JHA was not entered into BNI's Contractor Assurance Information System, therefore, there was no assurance the action would be completed. This is a Finding against the DOE M 231.1-2, Paragraph 5.6.f (**Finding A-07-AMWTP-RPPWTP-003-F15)**. (Inspection Note 003-80)

The WTP Project Manager requests BNI to provide a reply to the Findings within 30 days of receipt of the letter that transmitted this Notice. The reply should include:

1. Admission or denial of the Findings;
2. Reason for the Findings, if admitted, and if denied, the reason why;
3. Corrective steps that have been taken and the results achieved;
4. Corrective steps that will be taken to avoid further Findings; and
5. Date when full compliance with the applicable commitments in 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

REPORT NO.: A-07-AMWTP-RPPWTP-003

FACILITY: Bechtel National, Inc. (BNI)

LOCATION: 2435 Stevens Center Place
Richland, Washington 99354

DATES: July 1, 2007 through September 30, 2007

INSPECTORS: J. McCormick-Barger, Construction Inspection Lead
J. Bruggeman, ORP Facility Representative
J. Christ, ORP Facility Representative
B. Harkins, ORP Facility Representative
J. Navarro, ORP Facility Representative
E. Enloe, Team Member
M. Evarts, Team Member
R. Taylor, Team Member
D. Wallace, Team Member

APPROVED BY: J. R. Eschenberg, Project Manager
Waste Treatment and Immobilization Plant Project

INSPECTION REPORT

Introduction

During the period July 1, 2007 through September 30, 2007, the U.S. Department of Energy (DOE), Office of River Protection (ORP), Waste Treatment and Immobilization Plant (WTP) Project conducted inspections of Important-to-Safety (ITS) and non-ITS (Balance-of-Plant) activities during the construction of the WTP. These inspections were documented on inspection notes and maintained electronically. There were 93 inspections of various construction activities, summarized below. A summary listing of the inspection notes is included at the end of this report; copies of the inspection notes are available upon request.

Significant Observations and Conclusion

- During preparation and performance of substation maintenance, the pre-job briefings and work packages associated with Construction Utilities Group work on substations 2, 3, 9, & 15 met the Integrated Safety Management System (ISMS) core functions by identifying the hazards, describing clear roles and responsibilities, identifying the required safety standards, and implementing hazard controls. The work package also contained a work closure and feedback checklist for improving the process.

  However, Bechtel National, Inc. (BNI) did not have an effective program for implementing configuration management for these temporary substation power systems. BNI's "As-built" drawings had significant deficiencies that needed correction. Neither the Temporary Power Field Sketch Substation 2 Single Line "As-built" drawing or the Field Sketch T-52 Warehouse Electrical Notes and Schedules drawing adequately represented the actual wiring configuration. Furthermore, the temporary power feeder routed from Substation 2 to T-52 Warehouse Main Distribution Panelboard failed to comply with National Electrical Code (NEC) requirements (missing grounding conductors) and is a Finding against the requirements of Section C.7(f) of the Contract (requirement to comply with the NEC) (**Finding A-07-AMWTP-RPPWTP-003-F01**). (Inspection Note 003-01)

- BNI had performed and documented the required inspection on galvanized A325 bolts, attaching the Analytical Laboratory (LAB) building structural steel members. Testing was in accordance with the applicable design/installation documents. (Inspection Note 003-02)

- With one exception, BNI had adequate concrete procedures, controls, and equipment in place to produce, place, cure, and protect concrete during hot weather conditions. This exception is when BNI depends on the use of ice to help keep the concrete temperature below 70 degrees and if the ice equipment fails. There was no redundant icing capability. In this case, BNI would have to manually load ice into the concrete trucks which is a very slow process and the batch plant staff may not be able to keep up with construction concrete needs potentially causing an unplanned cold joint. BNI Construction Manager was reviewing this area. (Inspection Note 003-03)

- The work package issued for maintenance of Substation 16 met the ISMS core functions by identifying the hazards, describing clear roles and responsibilities, identifying the required safety standards, and implementing hazard controls.

Other than one exception, BNI had installed the electrical equipment at Substation 16 in accordance with the 2002 NEC. One Finding was identified for failure to install a 480 volt metal-clad cable in accordance with NEC Articles 300.10, 250.96, and 250.97 (cable was not bonded to the switchgear). This deficiency had minor safety impact and was being tracked by BNI's corrective action program (Project Issues Evaluation Report [PIER] #24590-WTP-PIER-MGT-07-0982). This deficiency will be tracked as a **Non-cited Finding A-07-AMWTP-RPPWTP-003-N02** for failure to comply with Section C.7(f) of the Contract (requirement to comply with the NEC). (Inspection Note 003-04)

- With the exception of performance of equipment spotters, BNI was adequately implementing vehicle safety at the WTP construction site. Construction Management acknowledged the exception discussed above and stated they would take actions to improve performance in this area. Follow-up to track resolution of this performance issue will be tracked as **Assessment Follow-up Item A-07-AMWTP-RPPWTP-003-A03**. (Inspection Note 003-05)
- BNI Safety Assurance failed to perform periodic field assessments of subcontractor safety and health performance regarding compliance with the Nonradiological Worker Safety and Health Plan. This was determined to be a **Finding (A-07-AMWTP-RPPWTP-003 F05)**. The intent of Exhibit G, Subcontractor Safety and Health Requirements, Paragraphs A, B, & C, was being met. However, BNI needed to clarify its expectations for how subcontractor jobsite walk-through safety inspections should be performed and documented. This was determined to be an **Observation (A-07-AMWTP-RPPWTP-003-O06)**. (Inspection Note 003-06)
- BNI had accomplished hydrostatic/pneumatic testing at various locations within the WTP Facility Site during the month of July 2007 in accordance with established requirements. (Inspection Note 003-07)
- Fit-up and welding activities at the WTP were consistently performed using the correct material, filler metal, and qualified welder in accordance with welding and design requirements. (Inspection Note 003-08, 003-09, 003-10, 003-14, 003-18, 003-19, 003-20, 003-23, 003-24, 003-25, 003-27, 003-32, 003-47, 003-55, 003-56, 003-57, 003-59, 003-62, 003-65, 003-66, 003-67, 003-73, 003-75, 003-82, 003-84, 003-85, 003-86, 003-87, 003-89, and 003-91)
- Installation of "wireways" at the Switchgear Building 87 and Fire Water Pump House Facilities A & B were not in accordance with NEC requirements because the "wireways" were miss identified and should have been installed as pull boxes, as indicated by the component manufacturer, and supported in accordance with Article 370-23 of the NEC **(Non-cited Finding A-07-AMWTP-RPPWTP-003-N04).** (Inspection Note 003-11)
- The adequacy of the actions taken by BNI to close Occurrence Report EM-RP--BNRP-RPPWTP-2006-018 was indeterminate, since formal documentation regarding the investigation and completion of the corrective actions was not provided. This was determined to be a **(Finding A-07-AMWTP-RPPWTP-003-F07)** for failure to document conditions adverse to safety and health. Also, the final Occurrence Reporting and Processing System (ORPS) report did not comply with the ORPS reporting time lines. Failure to comply with the ORPS reporting time lines was previously identified and corrective actions for this

problem will be tracked in Finding (A-07-AMWTP-RPPWTP-001-F02 see Inspection Note A-07-AMWTP-RPPWTP-001-04). (Inspection Note 003-12)

- BNI had installed the temporary power for the Low-Activity Waste (LAW) Rod/Tool room in accordance with the 2002 NEC. (Inspection Note 003-13)
- BNI addressed bolt torque record issues associated with Aboveground Piping Inspection Records (APIR). This was originally documented in Finding A-07-AMWTP-RPPWTP-002-F06. However, review of additional APIRs resulted in the identification of several minor examples of failure to follow procedures regarding other missing information on APIRs (such as missing required initials and dates for data entries and cross outs, and missing N/As in non-used boxes).

  Although the issues noted were minor and non-technical in nature, they indicate improvements continued to be needed regarding APIR records production and final review. At the request of Field Engineering, ORP temporarily suspended reviews of APIRs to allow BNI time to address this issue.

  Finding A-07-AMWTP-RPPWTP-002-F06 will remain open until BNI fully addresses APIR record errors. (Inspection Note 003-15)
- Work associated with Hazardous Energy Construction Utilities Group Work Packages for substations 8, 10, & 11 was performed with work packages that met the ISMS core functions by identifying the hazards, describing clear roles and responsibilities, identifying the required safety standards and implementing hazard controls. The work package also contained a work closure and feedback checklist for improving the process.

  BNI installed the electrical equipment associated with substations 8, 10, and 11 in accordance with the 2002 NEC. This completed the annual maintenance of all the substations. (Inspection Note 003-16)
- BNI installed an acceptable important-to-safety electrical duct bank located between MH-36 and MH-37 associated with the Pretreatment Facility (PTF) building. Conduit and concrete were in accordance with the installation requirements. (Inspection Note 003-17)
- BNI closed PIER #24590-WTP-PIER-MGT-07-0719 tracking the issue identified on Inspection Note A-07-AMWTP-RPPWTP-002-36 for documented safe switching procedure at the LAW Facility. Procedure/Guide Change Notice 24590-WTP-GPP-CON-3311(C) revising Section 3.5, Special Switching Instructions, was issued and approved and adequately addressed the NEC requirement. Based on this, Follow up Item A-07-AMWTP-RPPWTP-002-A07 is closed. (Inspection Note 003-21)
- BNI installed temporary power for Apollo Sheet Metal Mobile Office T-53 consisting of 100-amp disconnect and 100-amp panelboard in accordance with the 2002 NEC. (Inspection Note 003-22)
- Based on the actions taken by BNI and F. D. Thomas (FDT) to address hazards controls associated with FDT's respirator protection program, assessment follow-up item A-06-AMWTP-RPPWTP-003-A10 is considered closed. (Inspection Note 003-26)

- BNI's Suspect Counterfeit Item (S/CI) program was in compliance with DOE Order 414.1C, and BNI personnel were knowledgeable of the requirements and expressed an understanding of underlying functions and responsibilities essential to a successful S/CI Program. One inconsistency between BNI's S/CI procedure and DOE's Order 414.1C related to S/CI trending. BNI was conducting S/CI trending through their Non Compliance Report/Construction Deficiency Report process. To fully align this process with the DOE Order, BNI planned to revise their S/CI procedure to reflect the S/CI trending through the NCR/CDR trending process. BNI was revising its Quality Assurance Manual to add S/CI requirements, once approved this will require BNI to modify existing processes to address the need to designate certain S/CI documents as QA records. (Inspection Note 003-28)
- BNI took adequate actions to address assessment follow-up item A-07-AMWTP-RPPWTP-002-A09, regarding issues raised during placement of metal stakes near buried electrical cable. Immediate actions included, before any metal stakes were allowed to be driven into the WTP site, requiring construction staff to contact the Underground Services Coordinator (USC) the day before the work is performed, and requiring the USC to physically verify all locations by walking-down the job location. BNI also revised appropriate procedures to address the issues raised in the assessment follow-up item. Based on this, assessment follow-up item A-07-AMWTP-RPPWTP-002-A09 is closed. (Inspection Note 003-29)
- BNI was batching, placing, consolidating, and testing concrete for LAW wall #135F in accordance with engineering specifications and the Safety Requirement Document. (Inspection Note 003-31)
- With one exception, the revised Occupational Health and Safety Administration (OSHA) Electrical Installation Standard was consistent with the 1999 NEC and thus had already been imposed on BNI in the WTP Contract. The one exception was that Section 1910.303(f)(4) requires the disconnecting means and circuits for motors and appliances to be capable of accepting a lock. BNI committed to incorporate this requirement in the site National Fire Protection Association (NFPA) procedures and is tracking this issue in their corrective action program (PIER #24590-WTP-PIER-MGT-07-1272). Follow-up to verify this change occurs will be tracked as assessment follow-up item (**A-07-AMWTP-RPPWTP-003-A08**). (Inspection Note 003-33)
- BNI's oversight of Anvil International, Inc. was adequate. Supplier Quality Representative Reports indicated substantial verification activities were ongoing at this Supplier facility and issues raised by both BNI and the Supplier were being documented and addressed in an acceptable manner. Anvil's quality and welding programs were well established, reflecting a supplier with a long-history of supplying nuclear grade components. (Inspection Note 003-34)
- BNI's Supplier Quality Oversight of GE Hitachi (GEH) was acceptable. BNI was providing substantial on-site coverage of the fabrication of High Efficiency Mist Eliminators (HEME) tanks for the High-Level Waste (HLW) Facility. Minor weld procedure issues were identified and addressed by GEH. However, two significant issues were identified regarding BNI Engineering's direction to the Supplier for commercial grade dedication of bulk steel used to fabricate the tank base rings, and BNI Engineering's direction to the Supplier to purchase HEME tank filters, filter housings, and internal structures without specifying any welding,

quality, and performance requirements. Furthermore, BNI did not specify any Supplier Quality oversight requirements for this filter procurement. Follow-up on these issues will be tracked by **Assessment Follow-up Items A-07-AMWTP-RPPWTP-003-A09 and A-07-AMWTP-RPPWTP-003-A10** respectively. (Inspection Note 003-35)

- Fourteen hundred and sixty-three reviewed LAW/Balance of Facilities (BOF)/LAB Field Weld Checklists (FWCL) had been completed in accordance with 24590-WTP-MN-CON-01-001-08-01, Welding Documentation (WD-3). Nine FWCLs were found to have minor errors requiring correction. (Inspection Notes 003-30, 003-36, 003-37, 003-38, 003-41, 003-42, 003-43, 003-44, 003-46, 003-52, 003-53, 003-58, 003-60, 003-69, and 003-72)

- During performance of trouble shooting of the August 2, 2007, ground fault failure of Substation 9, BNI re-energized the Substation before adequately determining if it was safe to do so (required by NFPA-70E, Article 130.6). This action resulted in an unexpected arc flash and ground fault; re-tripping the Substation.

  The switching sequence work instructions/process did not meet the Integrated Safety Management System (ISMS) core functions to identify the hazards, describe clear roles and responsibilities, identify the required safety standards, and implement hazard controls. The Contractor failed to identify the source of the Substation 9 ground fault prior to re-energizing the circuits. NFPA 70E requires when a circuit is de-energized by a circuit protective device, the circuit shall not be manually re-energized until it has been determined that the equipment and circuit can be safely energized. Failure to ensure Substation 9 circuits were safe to energize after identifying a ground fault condition is a Finding against Contract Section C, Part C.7, Facility Specification, item (f) regarding the requirement to follow NFPA-70E requirements (**Finding A-07-AMWTP-RPPWTP-003-F12**). (Inspection Note 003-39)

- Two reviewed BOF APIRs were completed in accordance with 24590-WTP-GPP-CON-3503, *Aboveground Piping Inspection Record*. (Inspection Note 003-40)

- BNI had accomplished hydrostatic/pneumatic testing in accordance with established requirements. (Inspection Note 003-45)

- The BNI Industrial Health and Safety training program was judged to be of high caliber. The safety training documentation reviewed addressed the requirements and the conduct of safety training reviewed indicated effective instructor's technique for conveying safety information.

  A few suggestions for improvement include 1) provide knowledge checks for all the training topics; 2) include information on BNI's Lessons Learned website; 3) discuss differences in subcontractor requirements; and 4) improve audio equipment and quality of video taped training. These suggestions were shared with the BNI Field Safety Assurance Manager who acknowledged them. (Inspection Note 003-48)

- BNI failed to adequately perform a review of the single line drawings for the PTF and HLW Facilities. Engineering had not incorporated the correct overcurrent protection (circuit breaker trip rating) for multiple feeders based on the conductor ampacity rating per NEC Table 310-16. Five of the 13 drawings reviewed had numerous deficiencies that did not meet NEC requirements and several deficiencies were identified on two HLW drawings reviewed by BNI but not revised. Based on this, BNI failed to adequately implement and verify the corrective actions in PIER #24590-WTP-PIER-MGT-07-0263 and BNI's extent-of-condition

review was not adequate. This is a Finding for failure to implement Quality Assurance Manual Policy Q-16.1 Section 3 (**Finding A-07-AMWTP-RPPWTP-003-F11**). (Inspection Note 003-49)

- With two minor exceptions which were corrected immediately, the subcontractor had installed the electrical equipment, associated with temporary power installed for the Energy Solution Office Trailer located northeast of the PTF, in accordance with the 2002 NEC. (Inspection Note 003-50)
- BNI was adequately implementing the Respiratory Protection Program. However, BNI needed to maintain a respirator maintenance log and repair record or remove these requirements from the procedure. This was determined to be an Observation (**A-07-AMWTP-RPPWTP-003-O13**). BNI acknowledged and stated they would take actions to address this Observation. (Inspection Note 003-51)
- Stud welding Q-decking to structural steel in the LAW annex building was performed using the correct studs and stud welding them correctly using a qualified welder in accordance with applicable requirements. (Inspection Note 003-54)
- BNI installed pipe support LAW-PCW-H00581 in the LAW building using the correct materials and welded them together with the correct filler metal with a qualified welder in accordance with the appropriate design and welding program requirements. (Inspection Note 003-61)
- BNI installed forms, rebar, and embeds, in an acceptable manner in accordance with the design requirements, procedures, specifications, and required codes and standards for placement HLW-1005 slab on grade at elevation 0'-00". BNI had correctly filled out Concrete Pour Card HLW-1005. (Inspection Note 003-63)
- The PIER that closed the HLW Construction Pre-start items was reviewed and considered adequate. Based on this review, Assessment (**Follow-up Item A-07-AMWTP-RPPWTP-002-A05)** is closed. (Inspection Note 003-64)
- BNI adequately closed Occurrence Report EM-RP--BNRP-RPPWTP-2007-0008 LAW Occupational Injury - Fractured Wrist. Corrective actions were completed and were adequate to prevent recurrence of this event. An issue regarding complying with reporting time-line requirements was identified. A similar Finding for failure to comply with the ORPS reporting time-lines was identified in (Inspection Note A-07-AMWTP-RPPWTP-001-04). Follow-up on the corrective actions to address the time-line issue identified in this report will be tracked in this previously identified Finding (A-07-AMWTP-RPPWTP-001-F02). (Inspection Note 003-68)
- BNI had adequately closed Occurrence Report EM-RP--BNRP-RPPWTP-2007-0008 LAW All-thread rod falls from man basket. The corrective actions were completed and appeared adequate to prevent recurrence of this event. (Inspection Note 003-70)
- BNI had adequately closed Occurrence Report EM-RP--BNRP-RPPWTP-2007-0011, LAW Skip Pan Inadvertently Rotates and Bumps into Side of Occupied Scissor Lift Basket. Corrective actions were completed and appeared adequate to prevent recurrence of this event. An issue regarding complying with reporting time-line requirements was identified. A similar

Finding for failure to comply with the ORPS reporting time-lines was identified in Inspection Note A-07-AMWTP-RPPWTP-001-04. Follow-up on the corrective actions to address the time-line issue identified in this report will be tracked in this previously identified Finding (A-07-AMWTP-RPPWTP-001-F02). (Inspection Note 003-71)

- During installation of temporary power for the FDT Dust Collector at the LAB, four NEC code violations were identified, pertaining to grounding and working clearance requirements. This is contrary to the requirements specified in Section C.7(f) of the Contract (requirement to comply with NEC), and is considered a Finding. Because these issues were for temporary power and addressed during the inspection cycle (before being energized), these issues will be characterized as **Non-cited Finding A-07-AMWTP-RPPWTP-003-N14** for trending purposes and was both opened and closed in this inspection note. (Inspection Note 003-74)
- BNI installed the grounding cables and the raceway system, prior to concrete placement, at the HLW Vitrification Facility (HLW Slab 1005), Area 3, in accordance with design and the 1999 NEC. (Inspection Note 003-76)
- An assessment of BNI's implementation of the JHA program was performed. During the assessment a review of issues identified during two previous annual reviews of this program was performed (Inspection Notes A-05-AMWTP-RPPWTP-003-59 and A-06-AMWTP-RPPWTP-004-14). Due to identification of similar issues during this inspection, previously identified assessment follow-up item A-06-AMWTP-RPPWTP-004-A06 will remain open.

  JHAs continued to be generic, broad in scope, and rarely location or task specific. Because of the process used by workers to review the JHAs, the program failed to appreciably increase worker awareness of hazards or controls. Pre-job briefings that covered the JHA appeared to increase worker awareness but many activities continued on for months with only cursory reviews of the JHA. In some cases, the period between the pre-job brief and the start of work was extensive and workers were not re-reviewing the JHA before commencing the work activity. JHAs were often written with a large amount of everyday construction hazards and controls listed with no attempt to flag or identify critical hazards or controls. This left it up to the reader to identify the important items from the large amount of minor information. For example, the above ground piping installation JHA (24590-WTP-JHA-CON-03-021) used the first page to address common construction hazards like heat injury, biological hazards, strains, eye injury, head injury, foot injury, cold weather injury, and damage to hearing. Controls specified were very generic; drink water, insure stable footing, use Personal Protective Equipment (PPE). No effort was made to help the reader identify the significant hazard from the common every day hazards faced by construction workers.

  Based on the above, BNI's JHA process was not fully effective at communicating and implementing worker hazard awareness. The program failed to increase worker awareness of significant hazards.

  BNI management was briefed on these issues. The cover letter to this quarterly inspection report requested BNI to implement corrective actions to the JHA process to make it an effective program. Previously identified Assessment Follow-up Item A-06-AMWTP-RPPWTP-004-A06 will be used to track BNI's efforts to improve this important program. (Inspection Note 003-77)

- BNI was adequately implementing their Hazardous Communication program at WTP. (Inspection Note 003-78)
- Corrective actions implemented by BNI to address Occurrence Report EM-RP-PRRWTP-2007-0001, regarding an air sample taken from a sample pump on an LAW welder performing shielded metal arc welding exceeding the OSHA Permissible Exposure Limit for airborne chromium, was acceptable. (Inspection Note 003-79)
- Occurrence Report EM-RP--BNRP-RPPWTP-2007-0006, Occupational Injury – Broken Right Heel Bone, contained an acceptable discussion of causes and identified one corrective action. The corrective action was to revise the JHA to include evaluating the use of an alternate work platform. However, since the corrective action to revise the JHA was not entered into the Contractor Assurance Information System (CAIS), there was no assurance the action would be completed. Therefore, it was not possible to determine whether the revision would be adequate to close Occurrence Report EM-RP--BNRP-RPPWTP-2007-0006. This was determined to be a Finding (A-07-AMWTP-RPPWTP-003-F15) against the DOE M 231.1-2, Paragraph 5.6.f which states in part, "As prescribed on the Occurrence Reporting Model (Section 11) and depending on the Significance Category, the Facility Manager must track all corrective actions to closure…".

  Also, the final report, submitted into the ORPS reporting system, exceeded the required 45 day time limit. Failure to comply with the ORPS reporting time lines was previously identified and corrective actions will be tracked in Finding (A-07-AMWTP-RPPWTP-001-F02). (Inspection Note 003-80)
- BNI was batching, placing, consolidating, and testing concrete for HLW Slab 1005 in accordance with engineering specifications using concrete mix design F-7P with 5 1/2" to 8" slump. (Inspection Note 003-81)
- BNI had adequately closed Occurrence Report EM-RP--BNRP-RPPWTP-2007-014, *Worker Caught Between Lift and Wall*. Corrective actions, when completed, will be adequate to prevent recurrence. (Inspection Note 003-83)
- BNI performed batching, placing, consolidating, and testing of concrete for the above grade slab placement at LAW North Annex #137F in accordance with applicable requirements. (Inspection Note 003-88)
- BNI installed reinforcement, embeds, and electrical grounding for placement of LAW slab 137F in an acceptable manner in accordance with BNI's concrete work engineering specification and drawings. (Inspection Note 003-90)
- BNI adequately closed Occurrence Report EM-RP-BNRP-RPPWTP-2007-0016. (Inspection Note 003-92)
- BNI adequately closed Occurrence Report EM-RP-BNRP-RPPWTP-2007-0015 regarding a power cord pulled from a male cord cap. (Inspection Note 003-93)

List of Assessment Items Opened, Closed, and Discussed:

Opened

A-07-AMWTP-RPPWTP-003-F01	Finding	Failure of BNI to comply with National Electrical Code (NEC) requirements-Substation 2 to T-52 Warehouse Main Distribution Panelboard missing grounding conductors (Inspection Note 003-01).
A-07-AMWTP-RPPWTP-003-N02	Non Cited Finding	Failure to install a 480 volt metal-clad cable in accordance with NEC (not bonded to switch gear). (Inspection Note 003-04)
A-07-AMWTP-RPPWTP-003-A03	Assessment Follow-up Item	Follow-up on BNI actions to address equipment spotter performance issues. (Inspection Note 003-05)
A-07-AMWTP-RPPWTP-003-N04	Non Cited Finding	Wireways were miss-identified and should have been installed as pull boxes requiring supports. (Inspection Note 003-11)
A-07-AMWTP-RPPWTP-003-F05	Finding	Failure to perform periodic field assessments of subcontractor safety and health performance. (Inspection Note 003-06)
A-07-AMWTP-RPPWTP-003-O06	Observation	BNI needs to clarify its expectations for how subcontractor jobsite walk-through safety inspections should be performed and documented. (Inspection Note 003-06)
A-07-AMWTP-RPPWTP-003-F07	Finding	Documentation regarding the investigation and completion of the corrective actions to Occurrence 2006-018 was not provided. (Inspection Note 003-12)
A-07-AMWTP-RPPWTP-003-A08	Assessment Follow-up Item	Follow-up on BNI actions to address 29 CFR Section 1910.303(f)(4) requirement to have disconnecting means and circuits for motors and appliances to be capable of accepting a lock. (Inspection Note 003-33)
A-07-AMWTP-RPPWTP-003-A09	Assessment Follow-up Item	Review BNI Engineering's direction to GE Hitachi allowing the Supplier to commercial grade dedicate bulk steel used to fabricate the tank base rings with out performing physical tests.

		(Inspection Note 003-35)
A-07-AMWTP-RPPWTP-003-A10	Assessment Follow-up Item	Review BNI Engineering's direction to the Supplier to purchase HLW HEME tank filters, filter housings, and internal structures without specifying any welding, quality, and performance requirements. (Inspection Note 003-35)
A-07-AMWTP-RPPWTP-003-F11	Finding	Engineering had not performed an adequate extent-of-condition nor incorporate the correct overcurrent protection (circuit breaker trip rating) for multiple feeders based on the conductor ampacity rating per Table 310-16. (Inspection Note 003-49)
A-07-AMWTP-RPPWTP-003-F12	Finding	Failure to ensure Substation 9 circuits was safe to energize after identifying a ground fault condition. (Inspection Note 003-39)
A-07-AMWTP-RPPWTP-003-O13	Observation	BNI needed to maintain a respirator maintenance log and repair record or remove these requirements from the procedure. (Inspection Note 003-51)
A-07-AMWTP-RPPWTP-003-N14	Non Cited Finding	Four NEC code violations were identified with the Dust Collector at the Lab, pertaining to grounding and working clearance requirements. (Inspection Note 003-74)
A-07-AMWTP-RPPWTP-003-F15	Finding	BNI Occurrence Report 2007-0006 corrective action was not entered into the CAIS. (Inspection Note 003-80)

Closed

A-06-AMWTP-RPPWTP-003-A10	Assessment Follow-up Item	BNI and FDT efforts to address FDT Respirator Program Issues. (Inspection Note 003-26)
A-07-AMWTP-RPPWTP-002-A05	Assessment Follow-up Item	Follow-up on BNI's efforts to close five readiness review open items associated with the HLW restart. (Inspection Note 003-64)
A-07-AMWTP-RPPWTP-002-A07	Assessment Follow-up Item	Follow-up on BNI's actions to establish and control safe switching procedures when performing power isolations to support multiple work outage activities. (Inspection Note 003-21)

A-07-AMWTP-RPPWTP-002-A09	Assessment Follow-up Item	Follow-up on BNI actions to address issues with its Excavation and Backfill procedure. (Inspection Note 003-29)
A-07-AMWTP-RPPWTP-003-N14	Non Cited Finding	Four NEC code violations were identified with the Dust Collector at the Lab, pertaining to grounding and working clearance requirements. (Inspection Note 003-74)

Discussed

A-06-AMWTP-RPPWTP-004-A06	Assessment Follow-up Item	Follow-up on Contractor actions to address JHA process weaknesses. (Inspection Note 003-77)
A-07-AMWTP-RPPWTP-001-F02	Finding	Failure of BNI to implement the occurrence reporting time limits specified in DOE M 231.1-2 required in Section C.6, Standard 1(f)(3) of the BNI Contract (Inspection Notes 003-12, 003-68, 003-71and 003-80)
A-07-AMWTP-RPPWTP-002-F06	Finding	Failure to follow procedures resulting in missing information on APIRs, such as component numbers, incremental torque values, and torque verification signatures. (Inspection Note 003-15)

List of Inspection Notes Issued During the Assessment Period:

Inspection Note Number	Inspection Subject
A-07-AMWTP-RPPWTP-003-01	Electrical-Substation outage work; **F01**.
A-07-AMWTP-RPPWTP-003-02	LAB structural steel member bolting.
A-07-AMWTP-RPPWTP-003-03	Hot weather concrete placements.
A-07-AMWTP-RPPWTP-003-04	Electrical-Substation outage work; **N02**.
A-07-AMWTP-RPPWTP-003-05	Vehicle safety at the WTP; **A03**.
A-07-AMWTP-RPPWTP-003-06	Subcontractor safety oversight; **F05/O06.**
A-07-AMWTP-RPPWTP-003-07	Pressure testing in July 2007.
A-07-AMWTP-RPPWTP-003-08	Weld inspection of BOF Firewater Piping.
A-07-AMWTP-RPPWTP-003-09	Weld inspection of piping south of PTF.
A-07-AMWTP-RPPWTP-003-10	Fit-up inspection of LAW monorail system.
A-07-AMWTP-RPPWTP-003-11	Electrical wireway inspection; **N04**.
A-07-AMWTP-RPPWTP-003-12	Occurrence Report 2006-0018; **Finding F07**.
A-07-AMWTP-RPPWTP-003-13	Electrical-LAW mini load center inspection.
A-07-AMWTP-RPPWTP-003-14	LAB gusset weld inspection.
A-07-AMWTP-RPPWTP-003-15	APIR records review.
A-07-AMWTP-RPPWTP-003-16	Electrical-Sub-station work.
A-07-AMWTP-RPPWTP-003-17	ITS electrical duct bank installation.
A-07-AMWTP-RPPWTP-003-18	Weld inspection LAW piping.
A-07-AMWTP-RPPWTP-003-19	Weld inspection LAW piping.
A-07-AMWTP-RPPWTP-003-20	Weld inspection LAW piping.
A-07-AMWTP-RPPWTP-003-21	Closure of A-07-AMWTP-RPPWTP-002-A07.
A-07-AMWTP-RPPWTP-003-22	Electrical-Temp Power T53.
A-07-AMWTP-RPPWTP-003-23	Welding 12” BOF firewater piping.
A-07-AMWTP-RPPWTP-003-24	Welding support members for LAB airlock.
A-07-AMWTP-RPPWTP-003-25	Weld inspection LAW piping.
A-07-AMWTP-RPPWTP-003-26	Closure of A-06-AMWTP-RPPWTP-003-A10.
A-07-AMWTP-RPPWTP-003-27	Weld inspection of BOF co-ax piping.
A-07-AMWTP-RPPWTP-003-28	Suspect/Counterfeit Program review.
A-07-AMWTP-RPPWTP-003-29	Closure of A-07-AMWTP-RPPWTP-002-A09.
A-07-AMWTP-RPPWTP-003-30	FWCL records review.
A-07-AMWTP-RPPWTP-003-31	Concrete Placement-LAW Wall 135F.
A-07-AMWTP-RPPWTP-003-32	Weld inspection of BOF co-ax piping.
A-07-AMWTP-RPPWTP-003-33	Electrical inspection of new OSHA rule; **A08**.
A-07-AMWTP-RPPWTP-003-34	Anvil International Supplier Inspection.
A-07-AMWTP-RPPWTP-003-35	Supplier Inspection of GE Hitachi; **A09/A10**.
A-07-AMWTP-RPPWTP-003-36	FWCL records review.
A-07-AMWTP-RPPWTP-003-37	FWCL records review.
A-07-AMWTP-RPPWTP-003-38	FWCL records review.
A-07-AMWTP-RPPWTP-003-39	Electrical-Substation 9 ground fault trip; **F12**.
A-07-AMWTP-RPPWTP-003-40	APIR records review.
A-07-AMWTP-RPPWTP-003-41	FWCL records review.
A-**07-AMWTP-RPPWTP-003-42**	FWCL records review.
A-07-AMWTP-RPPWTP-003-43	FWCL records review.

A-**07-AMWTP-RPPWTP-003-44**	FWCL records review.
A-07-AMWTP-RPPWTP-003-45	Pressure testing of piping for August.
A-07-AMWTP-RPPWTP-003-46	FWCL records review.
A-07-AMWTP-RPPWTP-003-47	Weld inspection of BOF piping.
A-07-AMWTP-RPPWTP-003-48	IH&S Training Program.
A-07-AMWTP-RPPWTP-003-49	Electrical drawings review; **F11.**
A-07-AMWTP-RPPWTP-003-50	Electrical-Temp Power BOF.
A-07-AMWTP-RPPWTP-003-51	Respirator Program review; **O13**.
A-07-AMWTP-RPPWTP-003-52	FWCL records review.
A-07-AMWTP-RPPWTP-003-53	FWCL records review.
A-07-AMWTP-RPPWTP-003-54	Welding of Q-deck LAW steel.
A-07-AMWTP-RPPWTP-003-55	Weld inspection of BOF guide clips on sleepers.
A-07-AMWTP-RPPWTP-003-56	Weld inspection of BOF co-ax pipe.
A-07-AMWTP-RPPWTP-003-57	LAB Shim-plate fit-up inspection.
A-07-AMWTP-RPPWTP-003-58	FWCL records review.
A-07-AMWTP-RPPWTP-003-59	LAB Shim-plate final weld inspection.
A-07-AMWTP-RPPWTP-003-60	FWCL records review.
A-07-AMWTP-RPPWTP-003-61	LAW pipe support weld inspection.
A-07-AMWTP-RPPWTP-003-62	LAW 6” girth weld inspection.
A-07-AMWTP-RPPWTP-003-63	HLW-1005 FRE installation and concrete placement.
A-07-AMWTP-RPPWTP-003-64	Closure of A-07-AMWTP-RPPWTP-002-A05.
A-07-AMWTP-RPPWTP-003-65	LAW pipe fit-up inspection.
A-07-AMWTP-RPPWTP-003-66	LAW pipe final weld inspection.
A-07-AMWTP-RPPWTP-003-67	LAB carbon steel plate final weld inspection.
A-07-AMWTP-RPPWTP-003-68	Closure of Occurrence Report 2007-0008.
A-07-AMWTP-RPPWTP-003-69	FWCL records review.
A-07-AMWTP-RPPWTP-003-70	Closure of Occurrence Report 2007-0013.
A-07-AMWTP-RPPWTP-003-71	Closure of Occurrence Report 2007-0011.
A-**07-AMWTP-RPPWTP-003-72**	FWCL records review.
A-07-AMWTP-RPPWTP-003-73	BOF co-axial pipe final weld inspection.
A-07-AMWTP-RPPWTP-003-74	Electrical-LAB Temp. Power; **N14**.
A-07-AMWTP-RPPWTP-003-75	LAW pipe support final weld inspection.
A-07-AMWTP-RPPWTP-003-76	HLW Slab 1005 grounding configuration.
A-07-AMWTP-RPPWTP-003-77	Job Hazards Analyses program review.
A-07-AMWTP-RPPWTP-003-78	Hazardous Communication Review.
A-**07-AMWTP-RPPWTP-003-79**	Closure of Occurrence Report 2007-0001.
A-07-AMWTP-RPPWTP-003-80	Closure of Occurrence Report 2007-0006; **F15.**
A-07-AMWTP-RPPWTP-003-81	HLW Slab 1005 placement inspection.
A-07-AMWTP-RPPWTP-003-82	LAW Pipe repair by welding.
A-07-AMWTP-RPPWTP-003-83	Closure of Occurrence Report 2007-014.
A-07-AMWTP-RPPWTP-003-84	Weld fit-up inspection BOF PSA line.
A-07-AMWTP-RPPWTP-003-85	LAB Shim plate final weld inspection.
A-07-AMWTP-RPPWTP-003-86	LAB Shim plate final weld inspection.
A-07-AMWTP-RPPWTP-003-87	LAB Shim plate final weld inspection.
A-07-AMWTP-RPPWTP-003-88	Above grade slab at LAW North Annex #137F.
A-07-AMWTP-RPPWTP-003-89	LAW weld inspection.

A-07-AMWTP-RPPWTP-003-90	Concrete placement of LAW slab 137F.
A-07-AMWTP-RPPWTP-003-91	Welding LAW ISI piping.
A-07-AMWTP-RPPWTP-003-92	Closure of Occurrence Report 2007-0016.
A-07-AMWTP-RPPWTP-003-93	Closure of Occurrence Report 2007-0015.