U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

MAY 04 2006

06-WTP-055
Reissue

Mr. W. S. Elkins, Project Manager
Bechtel National, Inc.
2435 Stevens Center
Richland, Washington 99352

Dear Mr. Elkins:

CONTRACT NO. DE-AC27-01RV14136 – TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT NUMBER D-05-DESIGN-019: REVIEW OF BECHTEL NATIONAL, INC.'S (BNI) BALANCE OF FACILIES (BOF) EQUIPMENT, SYSTEM, AND FACILITY PRESERVATION, LAY-UP, AND TURNOVER PROCEDURES

ORP conducted an assessment to determine the adequacy and effectiveness of BNI's preventative maintenance, lay-up, and turnover procedures for BOF equipment, systems, and facilities in relation to Contract requirements. In addition, ORP assessed BNI's implementation of these procedures. The resulting detailed report is transmitted by attachment to this letter.

ORP acknowledges that BNI developed procedures in an effort to preserve Government property in accordance with Contractual requirements. The oversight team found programmatic issues resulting in the Contractor's failure to successfully preserve Government property involving both BNI procured/constructed and subcontracted facilities, systems and equipment. This deficiency is considered a finding requiring your response within 30 days after receipt of this letter. Furthermore, BNI's reply shall identify causes which have contributed to BNI's failure to meet Government property preservation requirements as well as identify corrective actions being implemented to comply with property preservation Contract requirements for both BNI direct procured/constructed and subcontracted facilities, systems and equipment.

This letter is not considered to constitute a change to the Contract. In the event the Contractor 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."

MAY 04 2000



If you have any questions, please contact me, or your staff may call Bill Hamel, Director, Waste Treatment and Immobilization Plant Project, Engineering Division, (509) 373-1569.

Sincerely,

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

WED:MAR

Attachment

cc w/attach:
D. Burks, BNI
W. Clements, BNI
J. P. Henschel, BNI
G. Shell, BNI
BNI Correspondence Control

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Attachment
06-WTP-055

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

## Design Oversight Report

## Review
## Balance of Facilities (BOF)
## Equipment, System and Facility
## Preservation Lay-Up and Turnover

## March 2006

## Design Oversight: D-05-DESIGN-019

**WED:MAR**
**March 30, 2006**

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# U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT

## REVIEW
## BECHTEL NATIONAL, INC. (BNI)
## BALANCE OF FACILITIES (BOF)
## EQUIPMENT, SYSTEM AND FACILITY PRESERVATION, LAY-UP AND TURNOVER PROCEDURES

**March 2006**

**Design Oversight: D-05-DESIGN-019**

Team Lead:

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Concurrence:

William F. Hamel, Director
Waste Treatment and Immobilization Plant Project
Engineering Division

Approved:

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

## Executive Summary

ORP's Waste Treatment and Immobilization Plant (WTP) Project, Engineering Division (WED) completed an assessment of Bechtel National Inc.'s (BNI) preservation and maintenance, lay-up and turnover performance of the following Waste Treatment Immobilization Plant (WTP) Balance of Facility (BOF) structures: (1) Steam Plant, (2) Cooling Tower, (3) Field Erected Tanks, (4) BOF Pumphouses, (5) Underground Utilities/Piping System, and (6) Chiller Compressor Plant (CCP) equipment. While conducting the assessment, the Design Oversight Team evaluated lines of inquiry by performing document reviews, and collaborative meetings with BNI Engineering, BNI Field Construction and Commissioning and Training (C&T) Group. The Design Oversight Team also conducted WTP site-visits to evaluate property preservation and turnover field conditions as well as evaluating implementation of BNI's programs and procedures.

The Design Oversight Team acknowledges BNI has developed procedures in an effort to preserve government property in accordance with Contract requirements. However, while conducting the assessment, the Oversight Team found programmatic issues resulting in the Contractor's failure to successfully preserve government property involving both BNI procured/constructed and subcontracted facilities, systems and equipment. Although BNI has identified some corrective actions, not all programmatic issues concerning property preservation deficiencies have been resolved.

The following factors may have contributed to BNI's programmatic deficiencies:

(1) Subcontracted facilities, systems and equipment, although nearly completed, have been in the acceptance phase for approximately one year with open punch list items. In addition, subcontractors have demobilized from the WTP site even though BNI heavily relies on its subcontractors to perform property preservation activities;

(2) There are deficiencies within BNI's programs/procedures related to ensuring subcontract/vendor facilities, systems and/or equipment are performed in accordance with Contract requirements; and

(3) Also, there are program deficiencies related to equipment data being entered into the Component Identification System (CIS) such that the equipment can be successfully transferred to the Component Maintenance Management System (CMMS). The process for entering subcontractor/vendor equipment data into CIS is cumbersome, consequently deficiencies have occurred. BNI has started identifying CIS program deficiencies, such as deficiencies listed in 24590-WTP-CAR-QA-05-186. However, this corrective action report (CAR) is currently open because some of the action items have not been completed. In addition, a BNI self assessment, number 24590-WTP-MAR-ENG-06-0005, was completed March 16, 2006. This assessment focused on reviewing reoccurring corrective action reports issued during 2004 and 2005 related to CIS deficiencies. All equipment information must be entered into CIS and transferred to CMMS in order to maintain and preserve government properly successfully.

In conclusion, the Oversight Team identified one finding which documents BNI's failure to successfully implement programs that will preserve government property. The Notice of Finding (NOF) number A-05-AMWTP-DESIGN-019-F01 is shown on pages (-iii- through -v-) of this Design Oversight Report. The NOF also illustrates a deficiency pattern involving the Contractor's failure to continuously preserve government property prior to development of property preservation issues.

**Notice of Finding**

Requirement: Contract DE-AC27-01RV14136, dated December 11, 2000, between DOE and BNI, Section I provides a list of required Federal Acquisition Requirements as follows:

Section I.88, Clause Federal Acquisition Regulation (FAR) 52.245-5, titled "Government Property," section (e) "Property Administration," subsection (2) states "The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound business practice and applicable provisions of FAR Subpart 45.5".

Section I.72, Clause FAR Clause 52.236-5 titled "Material and Workmanship" states "...All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended..."

Contract.STD.4.(f) Contract Page C.43/44 states "..... The Contractor shall maintain an adequate construction inspection system and acceptance testing system, and perform such inspections and testing, as well as ensure that the work performed under the Contract conforms to Contract requirements. The Contractor shall maintain complete inspection and testing records and make them available to DOE..."

While conducting the assessment, ORP discovered systemic programmatic issues resulting in the Contractor's failure to continuously preserve government property. Contrary to government property preservation Contract clause requirements, listed above, issuance of finding, number **A-05-AMWTP-DESIGN-019-F01**, documents programmatic failures where by BNI has not implemented programs in order to successfully preserve government property. The following factors may have contributed to the programmatic deficiencies:

(1) Subcontracted facilities, systems and equipment although nearly completed have been in the acceptance phase for approximately one year with open punch list items. In addition, subcontractors have demobilized from the WTP site even though BNI heavily relies on its subcontractors to perform property preservation activities;

(2) There are deficiencies within BNI's programs/procedures related to ensuring subcontract/vendor facilities, systems and/or equipment are performed in accordance with Contract requirements;

(3) Also, there are program deficiencies related to equipment data being entered into the Component Identification System (CIS) such that the equipment can be successfully transferred to the Component Maintenance Management System (CMMS).

The property preservation deficiencies illustrated below are examples in support of this finding:

1.0 BNI has not implemented long-term lay-up procedures for the Cooling Tower in accordance with BNI approved procedure numbers 24590-CM-HC1-MECM-00001-14-00067, titled "Mechanical Draft Cooling Tower Facility Lay-up Procedures"; section 1.0

Scope and 3.2 Protective Measures and 24590-BOF-3PS-G000-T002, titled "Performance Specification of Cooling Tower Facility"; Section 15, part 3.

2.0 BNI has not maintained the Cooling Tower fan motors in accordance with BNI approved procedure numbers 24590-CM-HC1-MECM-00001-14-00067 Mechanical Draft Cooling Tower Facility Lay-up Procedures; section 3.0 and 24590-CM-HC1-MECM-00001-14-00068 titled Maintenance Section.

3.0 BNI has not implemented indoor preservation storage requirements for the Chiller Compressors (CHW-CHU-00001A/B/C/D/E/F) in accordance with vendor requirements 24590-CM-POA-MERK-00001-09-00017, titled Field Storage Preparation "indoor storage in a non-condensing environment free from drafts" and 24590-WTP-MAP-AS-04-00211, titled Material Acceptance Plan Water Cooled Centrifugal Chillers.

4.0 BNI missed maintenance scheduled for the Centrifugal Air Compressors (PSA-CMP-00001A/B/C/D) in accordance with vendor document 24590-CM-POA-MCCA-00001-10-00010, section 2 and 3.

5.0 BNI has not maintained the Centrifugal Air Compressors oil temperature (PSA-CMP-00001A/B/C/D), which was out of specification in accordance with manufacturer's document, 24590-CM-POA-MCCA-10-00010 section 2.3

6.0 BNI/Vendor equipment damage during shipment resulting in Chiller Compressor purge valves (CHW-CHU-00001A/B/C/D/E/F) sustaining damage which resulted in loss/purge of factory nitrogen. Manufacturers document 24590-CM-POA-MERK-00001-09-00017 and shipping instructions.

7.0 BNI has not maintained the pumphouse facilities and the Diesel Driven Fire Pump at Pumphouse 84B in accordance with manufactures recommendations; the engines were not energized bi-yearly. Manufacturers document 24590-CM-HC1-MPGP-00001-38-00008 Section/Tab-19.

8.0 BNI constructed plant service air year distribution piping system. Document 24590-BOF-M6-PSA-00001, note 11 states "Construction to use compressors of oil free type and desiccant dryers of -40 deg-F dew point when using permanent plant piping for construction air."

9.0 BNI constructed utility pipeline maintenance issues involving Compressed Air supply to plant service air yard, 24590-BOF-M6-PSA-00001, 24590-BOF-FSK-CON-P-05-001, 24590-BOF-FSK-CON-P-05-018.

10.0 BNI did not constantly perform quarterly maintenance for the Steam Plant Facility in accordance with manufactures document 24590-CM-HC1-MBFO-00001-8-00044, section Lay-up Maintenance Procedure.

11.0 BNI/Vendor valve material and quality issues identified during receipt to Marshaling Yard; documented under NCR 24590-WTP-NCR-CON-06-0052.

12.0 Contrary to Contract clause requirements listed above, regarding establishing and maintaining a program for the maintenance and preservation of Government property, BNI issued CARs 24590-WTP-CAR-QA-06-067, failure to implement maintenance and/or lay-up for Cooling Tower and Steam Plant facilities/equipment per Contract Requirements; and 24590-WTP-CAR-QA-05-325, failure to implement Maintaining Plant Equipment per

Contract Requirements regarding (BOF Centrifugal Air Compressor); and 24590-WTP-CAR-QA-05-241 subcontractor requirement for NCR reporting to SA and SC not in subcontract QA programs.

13.0 Previous Finding issued by ORP: A-05-AMWTP-RPPWTP-004-F03; (separate deficiency from what is listed above; however, this is shown to note pattern of deficiencies), BNI was not maintaining the BOF Centrifugal Air Compressors in accordance with 24590-CM-POA-MCCA-00001-10-00010, *Atlas Copco Long Term Storage Procedure WI-108,* Rev 7.

BNI shall reply to the finding listed above, within 30 days after receipt date listed on the cover letter. This reply should include the following:

(1) Identify causes that have contributed to the Contractors failure to meet government property preservation requirements for both BNI constructed/direct procurements and subcontracted facility, systems and equipment, and

(2) Identify corrective actions to comply with property preservation requirements for both BNI constructed/direct procurements and subcontracted facility, systems and equipment.

## Table of Contents

## 1.0 INTRODUCTION

ORP's mission is to "retrieve and treat Hanford's tank waste and close the tank farms to protect the Columbia River." In order to complete one major component of this mission, ORP awarded BNI a contract for the design, construction, and commissioning of the WTP at Hanford, Washington. Even though BNI functions as ORP's Prime Contractor they have awarded various subcontracts to facilitate completion of this major project. WTP is comprised of three main vitrification facilities, an analytical laboratory, and 20 support facilities. The 20 support facilities are holistically portrayed as the BOF that includes facilities, systems and infrastructure. BOF consists of eight primary functional groups: power, steam, water, air, process support, waste facilities and miscellaneous support buildings. The power group consists of three switchgear buildings and a diesel generator facility. The steam group consists of a steam plant and a fuel oil facility. The water group consists of cooling towers, water treatment facility, chiller/compressor facility, and the firewater facility. The air group is made up of the chiller/compressor plant. The process support group consists of the glass former storage facility, wet chemical storage facility, and the anhydrous ammonia storage and supply facility. The waste facility group consists of the spent melter staging pad, failed melter storage facility, and the non-dangerous non-radioactive effluent facility. The last group is the miscellaneous support facility group, which includes the administration building, simulator facility, warehouse, and site infrastructure (roads, grading, lights, sanitary waste, storm drains, etc).

WED completed a design oversight assessing BNI's preservation and maintenance, lay-up, and turnover procedures and performance of the following WTP BOF structures: (1) Steam Plant; (2) Cooling Tower; (3) Field Erected Tanks; (4) BOF Pumphouses; (5) Underground Utilities/Piping System; and (6) Chiller Compressor Plant (CCP) equipment. The Design Oversight Team assessed design in relation to preventative maintenance, lay-up, and turnover procedures; including how successful the procedures were being implemented as well as implementation results. The WED Design Oversight Team chose BOF facilities since BOF is near construction completion with current preservation and maintenance, lay-up and/or equipment turnover activities in progress.

## 2.0 BACKGROUND

The information below briefly identifies the various divisions/groups within BNI that are performing preservation and maintenance, lay-up, and turnover activities:

BNI ENGINEERING – specifies and approves design documents, which includes preservation and maintenance and/or vendor/subcontractor requirements through all design phases in support of construction and commissioning. BNI Procurement is responsible for all acquisition service and tracking any damage or warranty open items for BNI direct procured equipment/systems in transit or upon WTP arrival.

COMMISSIONING and TRAINING (C&T) GROUP – The C&T group performs preservation and maintenance activities for equipment that is BNI direct procured. In addition, currently C&T is performing maintenance activities for three subcontracted facilities which are the Simulator

facility, Non-Important to Safety Switchgear facility and the BOF Switchgear facility. *The CCP equipment is BNI direct procured.*

FIELD ENGINEERING/CONSTRUCTION – This group is responsible for administering facilities and/or system subcontracts until turnover to the Start-up group. Subcontractors – BNI has tasked each subcontractor with implementing facility/system preservation activities until punch lists are closed and final "Acceptance of Completion Certificate" has been issued. After acceptance of completion the facilities/system will be turned over to the Construction Group. *The Field Erected Tanks (FET), Pumphouses, Cooling Tower, and Steam Plant are subcontracted facilities/systems.* The Construction group also constructs and maintains material/systems until turnover. *The Ungrounded Utilities are a BNI direct procured system.*

## 3.0 OBJECTIVES, SCOPE, AND APPROACH

### 3.1 Objective

The specific objectives of this assessment were to evaluate BNI and WTP site subcontractor's in the following areas of performance:

- Evaluate the development of "punch-list" procedures and record keeping during performance of construction completion walk-throughs, prior to final acceptance of subcontractor work.
- Evaluate the resolution and final Contractor acceptance of punch lists and procedures prior to final acceptance of subcontractor work.
- Evaluate procedures, programs and implementation of preservation activities for BOF equipment, systems and facilities in lay-up.
- Evaluate the training/qualification of personnel implementing the lay-up storage programs and procedures prior to Contractor turnover to DOE ORP.
- Evaluate the record keeping procedures demonstrating management of BOF equipment, systems and facilities during lay-up and turnover activities.
- Evaluate the programs BNI is utilizing to manage documents such as Operations and Maintenance (O&M) manuals and preservation data for BOF equipment, systems and facilities during lay-up and turnover activities.

### 3.2 Scope

WED completed Design Oversight D-05-DESIGN-019 by evaluating BNI's design in relation to how effective preventative maintenance, lay-up, and turnover procedures met Contract requirements as well as implementation results. The Design Oversight Team chose to assess the following BOF facilities since BOF is near construction completion with current preservation and maintenance, lay-up and/or equipment turnover activities in progress: (1) Steam Plant; (2) Cooling Tower; (3) Field Erected Tanks; (4) BOF Pumphouses; (5) Underground Utilities/Piping System; and (6) CCP equipment.

### 3.3 Approach

While conducting the assessment, the Design Oversight Team evaluated lines of inquiry (LOI) by performing document reviews, and collaborative meetings with BNI Engineering, BNI Field Construction and Commissioning and Training (C&T) Group. The Design Oversight Team also conducted WTP site-visits to evaluate property preservation and turnover field conditions as well as evaluating implementation of BNI's

programs and procedures. The following four areas were investigated and the information obtained enabled the Design Oversight Team to determine the adequacy and effectiveness of BNI's preventive maintenance, lay-up, and turnover programs.

- Verify that BNI has preservation and maintenance, lay-up, and turnover procedures that are being implemented for BOF Subcontractor systems, equipment and facilities.
- Verify that BNI has preservation and maintenance, lay-up, and turnover procedures that are being implemented for BNI constructed systems, equipment and facilities.
- Verify that BNI and Subcontractor lay-up and turnover procedures are sufficient in scope and will ultimately facilitate successful BOF facility and system turnovers.
- Verify that BNI has procedures for maintaining and turning over O&M manuals and preservation data for BOF equipment, systems and facilities during lay-up and turnover activities.

The documents reviewed and personnel contacted are provided in Section 7.0 of the Design Oversight Report; the LOI's are contained in Appendix B.

## 4.0 RESULTS

OVERALL PROGRAM COMPLIANCE: Government property preservation requirements are delineated within BNI Contract DE-AC27-01RV1436, which includes FAR clause 52.245-5 Material, and Workmanship, and FAR clause 52.245-5 Government Property. While conducting this assessment, the Design Oversight Team verified BNI had developed and implemented procedures and subcontracts in an effort to comply with property preservation and turnover requirements. However, while accomplishing objectives, the Design Oversight Team discovered BNI programmatic and performance incongruities regarding property preservation requirements. Section 4.1, summarized below, describes BNI and their subcontractor's along with applicable BNI approved property preservation and turnover procedures. Section 4.2, summarized below, evaluates the adequacy and effectiveness of BNI's property preservation and turnover management along with incongruities discovered, by the Design Oversight Team.

### 4.1 Preservation Management, Lay-Up, and Turnover Performance

SUBCONTRACTORS: The field activities of subcontractors are managed by BNI's Field Construction group, who utilizes the following procedures to administer WTP subcontracts, along with interfacing documents: (1) 24590-WTP-RPT-CN-01-004, titled Construction and Acceptance Testing Program; (2) 24590-WTP-GPP-CON-4101, titled Construction Subcontract Management; (3) 24590-WTP-GPP-CON-7105, titled Subcontractor Submittals; and (4) 24590-WTP-GPP-CON-4103, titled Subcontract Surveillance, Acceptance and Closeout (see Section 7.0, of this report, for a complete document list).

BNI FIELD CONSTRUCTED SYSTEMS: Underground (U/G) Utilities are a BNI procured/field constructed system. In part, BNI field construction utilizes the following procedures to administer WTP Construction along with interfacing documents: (1)

24590-WTP-GPP-GCB-00100, titled Field Materials Management; (2) 24590-WTP-RPT-CN-01-004, titled Construction and Acceptance Testing Program; and (3) 24590-WTP-GPP-CON-7113, titled System and Area Completion and Turnover. Parts of the U/G systems have been completed and tracked by a Parent Identification Number (PIN) within computer databases SetRoute (conduit) and TeamWorks (piping). Total U/G systems have not been completed; therefore, BNI Construction maintains control of these systems. (See Section 7.0, of this report, for a complete document list.)

C&T - GROUP: Upon BNI receipt and acceptance the C&T group performs property preservation activities for BNI direct procured, (component based) equipment, such as CCP-equipment. BNI Procurement is responsible for tracking any damage or warranty items while equipment is in transit or upon arrival, as identified in BNI procedure 24590-WTP-GPP-GCB-00100, titled Field Materials Management (FMM). In addition, the C&T group performs property preservation activities once BNI constructed, and subcontracted facilities, systems, and equipment are accepted by BNI. The C&T group uses BNI document 24590-WTP-GPP-CMNT-009, titled Equipment Preservation and Maintenance, along with interfacing documents, to implement property preservation requirements. The C&T group utilizes the CMMS database to manage component-based equipment and perform required preservation activities (see Section 7.0, of this report, for a complete document list).

4.2 **Preventative Maintenance, Lay-Up, Turnover Adequacy and Effectiveness**

SUBCONTRACT FACILTIES or SYSTEMS: Currently, some of the subcontracted facilities and systems are in the punch list and acceptance phase. However, no subcontracted facilities or systems have been accepted or turned over to BNI. BNI will not accept subcontracted facilities or systems until punchlist work is completed and all subcontract submittals have been received and accepted. Once BNI acknowledges completion of the subcontracted facilities, BNI will issue a "Certificate of Final Acceptance" to the subcontractor. After turnover to BNI, the C&T group will perform facilities and system preservation and maintenance requirements.

BNI utilizes a four to six month guideline for completion of the punch list and acceptance phase. Although the Cooling Tower, Steam Plant, Field Erected Tanks, and Pumphouses are virtually complete, they have been in the punch list and acceptance phase for approximately one year. BNI affirmed that, even though the subcontractors have demobilized, they will return to perform preservation activities and complete open punchlist items until final acceptance of the facilities; exactly when this will occur is not clear. BNI cited recent WTP schedule extensions and lack of funding as reasons for slow facility turnover and facility preservation activities not being performed judicially. In addition, BNI stated that lack of staffing required to effectively review and accept subcontract submittals was the reason subcontracts have not been finalized and accepted. The following paragraphs are examples of facility or system property preservation deficiencies.

- The construction of the Cooling Tower is nearly completed. A punch list has been generated but remains open. The subcontractor's preventative maintenance (PM) requirements are documented under BNI approved, procedures 24590-WTP-HC1-

MECM-00001 and lay-up procedure 24590-WTP-HC1-MECM-00001-14-00067. The maintenance records reflected the following deficiencies: (1) some PM requirements were performed on vertical turbine pumps and motors. However, some PM's were noted as not applicable with no explanation as to why deviations from approved procedures were acceptable; (2) according to maintenance records, temporary power was not supplied to motors that energize motor heaters; and (3) long term lay-up procedures approved by BNI was not implemented. Construction Deficiency Report (CDR) 24590-WTP-CDR-CON-06-0017 was written due to lack of required Cooling Tower fan motor maintenance per subcontractor document 24590-CM-HC1-MECM-00001-14-00067.

The Design Oversight Team discovered that even though BNI approved the Cooling Tower subcontractor's PM and long-term lay-up procedures; BNI was not proactively ensuring that the subcontractor comply with preservation programs or directly protect the integrity of the facilities and systems. Recommendations /Issues Tracking System (RITS) no. 24590WTP-RITS-QAIS-05-1341 has been initiated to track subcontractor facility system preservation compliance.

- The construction of the FETs is nearly complete with all FETs in the punch list and acceptance phase. Essential protective maintenance as stated in tank specification 24590-WTP-3PS-MTF5-T0001, titled Engineering Specification for Field-Erected Tanks Design and Fabrication has not been completed. Paragraph 8, entitled "Preparation for Completion". This paragraph states that in accordance with American Society of Mechanical Engineers (ASME) B16.5 "All flanged openings, which are not provided with a cover, shall be protected by an ASME B16.5 carbon steel blind flange..." The Design Oversight Team discussed this issue with BNI Construction and BNI stated they were currently in the process of covering all flanged openings. In addition, BNI stated that the specification was unclear as to whether the ASME requirement applied to flange openings when the vendor did not supply covers. An ORP-WTP Construction Oversight Inspector Report, A-05-AMWTP-RPPWTP002 assigned assessment follow-up item A-05-AMWTP-RPPWTP-002-A014 to track BNI's actions in establishing and implementing a preservation and maintenance program for the WTP equipment in the custody of WTP subcontractors. Also BNI issued a RITS item no. 24590-WTP-RITS-QAIS-05-1341 on December 22, 2005, to review PM requirements of subcontracts. The response to the RITS action is still in progress. Currently the FET's have flanged openings without covers, thus allowing debris, sand, and dirt etc, to infiltrate the tanks.

- Construction of the Pumphouses is nearly complete and in the punch list and acceptance phase. The preservation requirements are listed within 24590-BOF-3PS-G000-T0003 titled Engineering Specification for BOF Pumphouse Facilities, and 24590-CM-HC1-MPGP-00001- subcontractor preservation requirements along with supporting documents. The Design Oversight Team determined that required maintenance for the firewater pumps was not being performed as required. Based on Design Oversight Team discussions with BNI, a field change request was in process.

Since the time limit for performing the maintenance had already exceeded the manufacturer's recommendation, BNI issued CDR 24590-WTP-CDR-CON-06-0042, Diesel Driven Fire Pump at Pumphouse 84B tracking this deficiency.

- The Design Oversight Team determined the Steam Plant subcontractor's PM/lay-up procedures under document number 24590-CM-HC1-MBFO-00001 were adequate. BNI employed the subcontractor to perform preservation protection requirements that included adopting improvements to reflect any changing circumstances as necessary. However, one construction deficiency report (CDR) was written on December 19, 2005, number 24590-WTP-CDR-CON-06-0022, titled quarterly maintenance was not performed per requirements. Also, the Steam Plant punch list remains open and the facility has not been turned over to BNI.

PROPERTY MANAGEMENT DATABASES: BNI Construction stated that they were unsure if all subcontractor and vendor/supplier information has been entered into BNI's databases to facilitate successful property preservation activities. Supplier submittals including O&M manuals are entered into Infoworks. Supplier submittals are reviewed by affected groups, such as Engineering, C&T group and Construction, and accepted prior to being entered in Infoworks. The CIS is a WTP database management tool for numbering equipment, pipelines, valves and inline components to accommodate engineering design, support procurement, facilitate construction planning and integrate with the CMMS database. Currently, BNI Engineering has sole responsibility for entering data into the CIS database. The C&T group utilizes supplier submittal data from Infoworks and equipment/component data from CIS that has been transferred to CMMS in order to conduct property preservation activities. Verifying that required subcontractor, vendor and equipment information is within CIS and Infoworks will help assure that government property is adequately maintained.

BNI CONSTRUCTED SYSTEMS: U/G utilities are a BNI procured/field constructed system. The Design Oversight Team witnessed how sections of U/G systems, under construction, were managed within BNI's databases. Construction of the U/G systems was tracked by a PIN within computer databases, SetRoute (conduit), and TeamWorks (piping). The Design Oversight Team concluded BNI had adequate procedures and databases for tracking and protecting the U/G Utilities while construction is ongoing. Since only a portion of the U/G systems have been completed, BNI Construction maintains control. BNI is planning on breaking down sections within U/G utility system packages once turnover to the Startup group begins.

The Design Oversight Team concluded procedures were in place and successfully implemented for maintaining utilities currently being constructed and in the care of BNI Field Construction. One area that needed further definition by BNI was how the U/G systems will be turned over to the C&T Group.

C&T GROUP: The Design Oversight Team discovered that the C&T group uses BNI procedure 24590-WTP-GPP-CMNT-009, Equipment Preservation and Maintenance, along with interfacing documents to implement PM and lay-up requirements. The C&T

group also utilizes the CMMS database to manage PM, lay-up and turnover activities. C&T currently performs preservation activities for BNI direct procured equipment once received and accepted, such as the CCP – equipment. In addition, C&T performs preservation activities for the following subcontracted facilities: Simulator Facility, BOF Switchgear Facility Non-Important to Safety (Non-ITS) Switchgear Facility and (ITS) Switchgear Facilities. BNI Procurement is responsible for tracking any damage or warranty items while equipment is in transit or upon arrival, as identified in BNI document 24590-WTP-GPP-GCB-00100, FMM.

The Design Oversight Team inspected the CMMS database system, which was directly linked to a variety of BNI database systems such as Work Order (WO) planner. WO planner was linked to Project Document Control (PDC) for computer access of cross cutting information such as, datasheet, test procedures, O&M manuals etc. The Design Oversight Team assessed a sampling of CCP – equipment work orders, weekly/monthly PM schedules, as well as PM logs. Although equipment preservation performance deficiencies have occurred the procedures were satisfactory.

ORP Inspection Note number A-05-AMWTP-RPPWTP-002-65, dated May 18-19, 2005, stated that ORP Inspection follow-up item number A-05-AMWTP-RPPWTP-002-A13 was issued to track implementation of previously approved vendor preservation procedures for Centrifugal Air Compressors (PSA-CMP-00001A; 00001B; 00001C; 00001D). ORP's On-Location Inspection Report, number A-05-AMWTP-RPPWTP-004/ 06-WTP-001, dated January 12, 2006, included ORP Follow-up Inspection note number A-05-AMWTP-RPPWTP-004-34, dated November 7, 2005; which also included inspection results from previous follow-up inspection item listed above A-05-AMWTP-RPPWTP-002-A13. The A-05-AMWTP-RPPWTP-004 On-Location Inspection Report closed follow-up item ending in A13 through issuance of a Finding A-05-AMWTP-RPPWTP-004-F03. The Finding states "Contrary to Contract requirements; FAR clause 52.245-5, Government Property, BNI was not maintaining the BOF Centrifugal Air Compressors property preservation required per BNI approved manufacturer's storage procedures 24590-CM-POA-MCCA-00001-10-00010; Atlas Copco Long Term Storage Procedure, Rev 7. Since this Finding was issued under Inspection Report number A-05-AMWTP-RPPWTP-004, dated January 12, 2006, the following additional CDR's and CAR's were written regarding the CCP equipment.

1. 24590-WTP-CDR-CON-06-0016, Chiller Storage Issues; Vendor Indoor Storage Requirements, dated January 30, 2006.
2. 24590-WTP-CDR-CON-06-0025, Chiller Storage Issues; Vendor Indoor Storage Requirements, dated February 2, 2006.

The Design Oversight Team concluded that implementation of property preservation and lay-up requirements have not been fully successful. In addition, it is essential that deficiencies within BNI databases such as CIS are resolved so that all subcontractor, vendor and equipment data can be successfully migrated into CMMS in order facilitate successful property preservation. Once C&T further enhances procedures and programs to include preservation and maintenance for all subcontracted facilities and systems,

BNI's execution of property preservation will become increasingly successful. Below is a list of deficiency reports that were issued regarding CCP – equipment preservation and maintenance requirements:

1. 24590-WTP-CDR-CON-05-0138, Loss of N2 purge during shipment of CCP – Chillers, dated July 30, 2005;
2. 24590-WTP-CDR-CON-05-0202, Packaged Heat-of-Compression Air Dryers, dated October 4, 2005;
3. 24590-WTP-CDR-CON-05-0228, Centrifugal Air Compressors maintenance, dated November 10, 2005;
4. 24590-WTP-CDR-CON-06-0016, Oil Temperature (out of spec) for Centrifugal Air Compressors, dated January 30, 2006;
5. 24590-WTP-CDR-CON-06-0025, Chiller Storage Issues; Vendor Indoor Storage Requirements, dated March 2, 2006;
6. 24590-WTP-CAR-QA-05-0325, Failure to implement Contract Requirements regarding Maintaining Plant Equipment, dated December 21, 2005; and
7. ORP issued Finding A-05-AMWTP-RPPWTP-004-F03; previous finding issued for preservation and maintenance on Centrifugal Air Compressors not in accordance with Contract requirements and vendor requirements, dated January 12, 2006.

## 5.0 CONCLUSIONS

The Design Oversight Team acknowledges BNI has developed procedures in an effort to preserve government property according to Contract requirements. However, while conducting the Design Oversight, the Oversight Team discovered systemic programmatic issues resulting in the Contractor's failure to successfully preserve government property involving both BNI procured/constructed and subcontracted facilities, systems and equipment. Although BNI has identified some corrective actions, not all programmatic issues concerning property preservation deficiencies have been resolved. In general, BNI's approach to date has been to react to each property preservation issue with a corrective action, as opposed to pursuing a proactive approach to meet property preservation contract requirements. The following factors may have contributed to BNI's programmatic deficiencies:

(1) Subcontracted facilities, systems and equipment, although nearly completed, have been in the acceptance phase for approximately one year with open punch list items. In addition, subcontractors have demobilized from the WTP site even though BNI heavily relies on its subcontractors to perform property preservation activities;

(2) There are deficiencies within BNI's programs/procedures related to ensuring subcontract/vendor facilities, systems and/or equipment are performed in accordance with Contract requirements; and

(3) Also, there are program deficiencies related to equipment data being entered into the Component Identification System (CIS) such that the equipment can be successfully transferred to the Component Maintenance Management System (CMMS). The process for entering subcontractor/vendor equipment data into CIS is cumbersome, consequently

deficiencies have occurred. BNI has started identifying CIS program deficiencies, such as deficiencies listed in 24590-WTP-CAR-QA-05-186. However, this corrective action report (CAR) is currently open because some of the action items have not been completed. In addition, a BNI self assessment, number 24590-WTP-MAR-ENG-06-0005, was completed March 16, 2006. This assessment focused on reviewing reoccurring corrective action reports issued during 2004 and 2005 related to CIS deficiencies. All equipment information must be transferred to CMMS via CIS in order to maintain and preserve government properly successfully.

One Finding was identified, listed below in paragraph 6.0, documents BNI's failure to successfully implement programs that will preserve government property in accordance with Contract requirements.

## 6.0 FINDINGS OR OPEN ITEMS

Finding number A-05-AMWTP-DESIGN-019-F01 has been issued documenting BNI's failure to successfully implement programs that will preserve government property. The Notice of Finding (NOF) is shown on pages (-iii- through -v-) of this Design Oversight Report. The NOF also illustrates a deficiency pattern involving the Contractor's failure to continuously preserve government property prior to development of property preservation issues.

## 7.0 REFERENCES AND PERSONNEL CONTACTED

**References**

Contract and Contract Deliverables

- DE-AC27-01RV14136, WTP Contract.
- 24590-WTP-RPT-CN-01-001, Revision 0, Construction, Procurement and Acceptance Testing, dated July 1, 2001.
- 24590-WTP-RPT-CN-01-004, Revision 1, Construction and Acceptance Testing Program, dated July 1, 2001.

DOE ORP and BNI Correspondence

- 05-WTP-227, ORP letter to BNI, dated October 19, 2005, titled "Inspection Report A-05-AMWTP-RPPWTP-003 – On-Location Inspection Report for the Period July 1, 2005, Through September 30, 2005," Finding for welding issues.
- 06-WTP-001, ORP letter to BNI, dated January 12, 2006, titled "Inspection Report A-05-AMWTP-RPPWTP-004 – On-Location Inspection Report for the Period October 1, 2005, through December 30, 2005," Preservation and Maintenance of Government Property Issues; A-05-AMWTP-RPPWTP-004-F03, Finding issued for "Contrary to the Contract requirements; FAR clause 52.245-5, Government Property, requirement regarding establishing and maintaining a program for the maintenance and preservation of Government Property. The Finding cites Contractor's failure to maintain the Centrifugal Air Compressors in accordance with Manufactures requirements. A-05-AMWTP-RPPWTP-002-65, ORP Inspection Note, dated May 18-19, 2005; A-05-AMWTP-RPPWTP-004-34, ORP Inspection Note, dated November 7, 2005.
- CCN: 134100, BNI letter to ORP, dated February 16, 2006, titled "Response to Inspection

Report A-05-AMWTP-RPPWTP-004 – On-Location Inspection Report for the Period October 1, 2005, through December 30, 2005," Response to ORP letter 06-WTP-001, dated January 12, 2006.

- 06-WED-001, ORP letter to BNI, dated January 26, 2006, titled "Protection, Preservation and Maintenance of Government Property."
- CCN: 132371, BNI letter to ORP, titled "Protection, Preservation and Maintenance of Government Property," dated February 6, 2006. Initial response to ORP letter 06-WED-001, dated January 26, 2006.
- CCN: 132371, BNI letter to ORP, titled "Protection, Preservation and Maintenance of Government Property," dated February 6, 2006. Second response to ORP letter 06-WED-001, dated January 26, 2006.

Corrective Action Reports

- 24590-WTP-CAR-QA-04-134, Data in CIS not updated to align with changes issued on material datasheets, dated 2004.
- 24590-WTP-CAR-QA-05-099, Inaccurate data in Controlled State of CIS, dated 2005.
- 24590-WTP-CAR-QA-05-238, CIS data does not comply with minimum data entry as defined in 24590-WTP-3DP-G04B-00028, dated 2005.
- 24590-WTP-CAR-QA-05-186, Components on subcontractor as-built drawing are not entered in the Component Information System, dated August 11, 2005.
- 24590-WTP-CAR-QA-05-325, Inadequate Equipment PM per Contract Requirements, dated December 21, 2005.
- 24590-WTP-CAR-QA-05-241, Subcontractor Requirements for NCR reporting to SA and SC, dated September 25, 2005.
- 24590-WTP-CAR-QA-06-067, BOF Cooling Tower and Steam Plant.

BNI CDR's

- 24590-WTP-CDR-CON-05-0138, Loss of N2 purge During Shipment of CCP Chillers.
- 24590-WTP-CDR-CON-05-0202, Packaged Heat-of-Compression Air Dryers.
- 24590-WTP-CDR-CON-05-0228, Centrifugal Air Compressor.
- 24590-WTP-CDR-CON-06-0004, Air Compressors/Desiccant Dryers supply lines.
- 24590-WTP-CDR-CON-06-0016, Oil Temperature for Centrifugal Air Compressors.
- 24590-WTP-CDR-CON-06-0025, Chillers storage issue; Vendor requires indoor storage.
- 24590-WTP-CDR-CON-06-0017, Inadequate Cooling Tower Facility Fan Maintenance.
- 24590-WTP-CDR-CON-06-0004, Permanent Compressed Air's supply line and Air Dryers.
- 24590-WTP-CDR-CON-06-0017, Cooling Tower PM's.
- 24590-WTP-CDR-CON-06-0022, Maintenance December 19, 2005, not performed per requirements.
- 24590-WTP-CDR-CON-06-0042, Diesel Driven Fire Pump at Pumphouse 84B.

BNI NCR's

- 24590-WTP-NCR-CON-06-0052, Supplier Nonconformance; material issues.

Tracking System

- 24590-WTP-RITS-QAIS-06-0123, Preservation per Government Owned Property.

- 24590-WTP-RITS-QAIS-05-1341, Inadequate Subcontractor preservation compliance.
- 24590-WTP-PWO-CMNT-05-1041, Work Order for CCP – Oil Free Screw Compressor, annually.
- 24590-WTP-PWO-CMNT-05-1762, Work Order for CCP – Chiller Compressors, monthly.
- 24590-WTP-PWO-CMNT-06-0214, Work Order for CCP – Centrifugal Air Compressors, monthly.
- 24590-WTP-PWO-CMNT-06-0294, Work Order for CCP – Centrifugal Air Compressors, weekly.
- 24590-WTP-PWO-CMNT-06-0295, Work Order for CCP – Centrifugal Air Compressors, bi-weekly.

BNI Assessments

- 24590-WTP-IAR-QA-05-0009, Field Engineering and QC/QA, dated October 31, 2005.

BNI Procedures

- 24590-WTP-GPP-CON-6201, Revision 4, Equipment Preservation and Maintenance, dated June 28, 2005.
- 24590-WTP-GPP-CON-3607, Revision 2, Operation of Systems under Construction Custody, dated November 1, 2005.
- 24590-WTP-RPT-CN-01-004, Revision 1, Construction and Acceptance Testing Program, dated November 15, 2003.
- 24590-WTP-GPP-CON-4103, Revision 0, Subcontract Surveillance, Acceptance, and Closeout, dated July 24, 2004.
- 24590-WP-RPT-CN-01-001, Revision 0, Construction, Procurement and Acceptance Testing, dated July 2, 2001.
- 24590-WTP-GPP-CON-7113, Revision 1, Construction Record Completion, dated July 20, 2005.
- 24590-WTP-GPP-CON-1602, Revision 0, System and Area Completion and Turnover, dated March 16, 2005.
- 24590-WTP-RPT-CN-01-004, Revision 1, Construction and Acceptance Testing Program, dated November 15, 2003.
- 24590-WTP-GPP-CON-4101, Revision 8, Construction Subcontract Management, dated January 11, 2006.
- 24590-WTP-GPP-CON-7105, Revision 2, Subcontractor Submittals, dated October 13, 2004.
- 24590-WTP-GPP-MGT-0013, Revision 4, Acceptance of Procured Material, dated February 21, 2005.
- 24590-WTP-GPP-GCB-0100, Revision 11, Field Materials Management, dated April 15, 2005.
- 24590-WTP-GPP-PSQ-0050, Revision 3, Receiving Inspection, dated September 30, 2005.
- 24590-WTP-GPP-CON-7110, Revision 4, Material Receiving Instructions, dated July 28, 2005.
- 24590-WTP-GPP-CON-7109, Revision 5, Material Control, dated August 11, 2005.
- 24590-WTP-GPP-CON-7101, Revision 7, Construction Quality Control Program, dated October 27, 2005.
- 24590-WTP-IAR-QA-05-0009, Revision 0, Field Engineering and QC and Quality Control,

dated October 31, 2005.
- 24590-WTP-RPT-OP-01-001, Revision 2, Operations Requirements Document, dated May 5, 2003.
- 24590-WTP-GPP-CON-1201, Revision 4, Construction Work Packages, dated January 29, 2004.
- 24590-WTP-GPP-CON-3103, Revision 9, Field Change Requests/Field Change Notices, dated November 23, 2005.
- 24590-WTP-GPP-CON-3106, Revision 5, Construction Deficiency Reporting & Control, dated December 29, 2004.
- 24590-WTP-GPP-CON-7104, Revision 6, Nonconformance Reporting & Control, dated October 27, 2004.
- 24590-WTP-3DP-G03B-0004, Revision 5, Standard Component Numbering, dated November 29, 2005.
- 24590-WTP-3DP-G04B-00058, Revision 4, Supplier Engineering and Quality Verification Doc, dated August 1, 2005.
- 24590-WTP-3DP-G06B-00002, Revision 5, Subcontracts, dated August 1, 2005.
- 24590-WTP-GPP-GPX-00602, Revision 3, Subcontract PO Modification and Changes, dated January 23, 2006.
- 24590-WTP-GPP-AS-001, Revision 3, Purchasing Flow Process, dated May 31, 2005.
- 24590-NP-SRA-HX00-00009-02-0000, Revision 00B, CHAMPS document, dated September 15, 2005.

BNI Specifications, O&M, PM and/or Lay-up Document for Facilities, Equipment and/or Systems
- 24590-CM-POA-MCCA-00001-16-00001 O&M; Centrifugal Air Compressors.
- 24590-CM-POA-MCCA-00001-16-00002 O&M; Centrifugal Air Compressors.
- 24590-CM-POA-MCCA-00001-08-00004 PM; Rotary Screw Compressors.
- 24590-CM-POA-MCCA-00001-10-00014 PM; Compression Air Dryers.
- 24590-CM-POA-MCCA-00001; Prefix number for other CCP – equipment Vendor Documents.
- 24590-CM-POA-MERK-00001-09-00017; Long Lay-up; Centrifugal Chillers.
- 24590-CM-POA-MERK-00001; Prefix number for other CCP – equipment Vendor Documents.
- 24590-CM-HC1-MBFO-00001-10-00119; Temporary Lay Up Submittal for Boiler Room Equipment.
- 24590-BOF-FD-M-01-001, Revision A; Steam Plant Facility Description.
- 24590-CM-HC1-MBFO-00001-04-00019; Steam Plant Floor Plan – as built.
- 24590-CM-HC1-MBFO-00001-04-00021; Steam Plant P&ID – as built.
- 24590-CM-HC1-MBFO-00001-04-00032; Steam Plant P&ID – as built.
- 24590-CM-HC1-MBFO-00001-04-00098; Package Boiler P&ID – as built.
- 24590-CM-HC1-MBFO-00001-08-00044; Boilers and Ancillary Equipment Lay Up Maintenance Procedures.
- 24590-CM-POA-MBFO-00001; Prefix number for other Steam Plant Documents.
- 24590-BOF-3PS-G000-T0003; Engineering Specification for BOF Pumphouse Facilities.
- 24590-BOF-3PI-G000-00003; Design Input Memorandum, Performance Specification for

BOF Pumphouse, dated December 9, 2002.

- 24590-CM-HC1-MPGP-00001; Prefix number for other BOF Pumphouse design and requirements.
- 24590-CM-HC1-MPGP-00001-38-00002, Revision 00A, Operations/Installation Manual, NLD Pumphouses, dated March 1, 2005.
- 24590-CM-HC1-MPGP-00001-13-00015, Revision 00A, Instrument List, received by WTP Field Subcontracts, dated April 18, 2005.
- 24590-CM-HC1-MPGP-00001-38-00009, Revision 00A, Long Term Storage Maintenance Log, dated August 4, 2005.
- 24590-CM-HC1-MPGP-00001-31-02, Revision 00B, DFO Pump Installation and O&M Manual (Pumps), dated February 12, 2004.
- 24590-CM-HC1-MPGP-00001-14-01, Revision 00A, BOF Pump House Facilities QA Project, dated April 18, 2003.
- A-05-AMWTP-RPPWTP-002-65, Field Representative's Inspection Notes, dated May 18, 2005.
- A-05-AMWTP-RPPWTP-004-34, Field Representative's Inspection Notes, dated November 7, 2005.
- 24590-BOF-3PS-G000-T0003, Revision 1, Engineering Specification for BOF Pump House Facilities, dated December 8, 2003.
- 24590-WTP-3PI-MTF5-T0001, Revision 0, Engineering Specification for Field-Erected Tanks Design and FAB, dated December 5, 2002.
- 24590-BOF-FD-M-01-007, Revision A, Fire Pump House Facility Description, dated November 11, 2001.
- 24590-BOF-FD-M-01-005, Revision A, Fuel Oil Pumphouse Facility Description, dated November 12, 2001.
- FD-W375BF-G00013, Revision A, NLD Pumphouse Facility Description, dated February 4, 2000.
- 24590-BOF-3YD-FSW-00001, Revision 0, SD for the Fire Service Water Storage & Distribution System, dated May 17, 2002.
- 24590-BOF-3YD-NLD-00001, Revision 0, SD for the Non-Radioactive Liquid Waste Disposal System, dated March 2, 2003.
- 24590-BOF-3YD-DFO-00001, Revision A, SD for the Diesel Fuel Oil System, dated June 30, 2002.
- 24590-WTP-RPT-CN-01-004, Revision 1, Construction and Acceptance Testing Program, dated November 15, 2003.
- 24590-WTP-PL-OP-01-004, Revision C-1, WTP Maintenance Implementation Plan, dated December 14, 2001.
- 24590-WTP-GPP-CON-3506, Revision 0, Purge Drying, De-Purging, Lay-up of Piping Systems, dated June 9, 2003.
- 24590-WTP-RPT-OP-01-001, Revision 2, Operations Requirements Document dated May 5, 2003.
- 24590-WTP-3PS-PS02-T0003, Revision 4, Eng Spec Field Fabrication Installation of Piping dated April 4, 2005.
- 24590-WTP-3PS-NW00-T0002, Revision 1, Engineering Specification for Chemical Requirements, dated March 8, 2005.

- 24590-WTP-3PS-P000-T0001, Revision 5, Engineering Specification for Piping Material Classes, dated February 23, 2005.
- 24590-BOF-3PS-PX12-T0006, Revision 0, Eng Spec Underground Anhydrous Ammonia, dated October 27, 2004.
- 24590-BOF-3PS-CY01-T0001, Revision 1, Eng Spec Cooling and Chilled Water Pipe Installation, dated March 21, 2004.
- 24590-BOF-3PS-PX12-T0003, Revision 0, Eng Spec Demineralized Water Piping Installation, dated July 9, 2003.
- 24590-BOF-3PS-PX12-T0005, Revision 0, Eng Spec Process Service Water Piping Installation, dated July 8, 2003.
- 24590-BOF-3PS-PZ41-T0005, Revision 0, Eng Spec U/G Raw Water System Piping Installation, dated June 16, 2003.
- 24590-BOF-3PS-PX12-T0001, Revision 4, Eng Spec PVC Potable Water Piping Installation, dated June 11, 2003.
- 24590-BOF-3PS-PX-12-T0004, Revision 0, Eng Spec U/G Diesel Fuel Oil Piping Installation, dated June 11, 2003.
- 24590-BOF-3PS-PX12-T0002, Revision 0, Eng Spec Installation of PVC NLD System Piping, dated May 16, 2003.
- 24590-BOF-3PS-PZ41-T0001, Revision 3, Eng Spec U/G Fire Protection Piping Mains, dated October 14, 2002.
- 24590-BOF-3PS-P000-T0001, Revision 3, Eng Spec Installation of U/G Compressed Air Piping, dated October 3, 2002.

http://www.hanford.gov/orp
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## 7.1 Personnel Contacted

BNI:
W. Clements, LBL Manager
J. Roth, Engineering
T. Dallas, C&T
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T. Burks, C&T
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ORP Assessment Team Members:
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M. Ryan

## 8.0 LINES OF INQUIRY

### D-05-DESIGN-019, Revision 1 Questions/Inquiry Dated 12-1-05

**"DESIGN OVERSIGHT"** BOF Equipment, Systems and Facilities Turnover Testing

| Question | Comment | Contractor Response |
|---|---|---|
| **General Question** : | | |
| (1) Please send us the issue and resolution of any **CDR's**, **NCR's** or **SDDR's** regarding lay-up/turnover of BOF equipment, systems within the facilities identified in this Oversight Plan. (**Cooling Tower**, **Field Erected Tanks/Pump Houses/UG Piping**, **Chiller Compressor Plant** and **Steam Plant**) | (1) The only one I am aware of is 24590-WTP-CDR-CON-05-0228; (BOF-CCP) "Atlas; Storage and maintenance requirements for four centrifugal compressors were not met for the month of October 2005." | No other CDR's, NCR's or SDDR's have been issued regarding preservation and maintenance of equipment and systems identified in the oversight plan. |
| (2) Is there a document that shows/outlines how BNI –Design/Engineering interfaces with BNI – Construction regarding Lay-up/Turnover procedures? How can we obtain this document? | | Design engineering specifies preservation and maintenance requirements or validates vendor/subcontractor requirements and issues these requirements via approved specifications and design documents. Construction and C&T implement these requirements. |
| (3) How is lay-up for equipment/systems that are identified in the Oversight Plan being tracked/documented? Does the documentation identify who the responsible party is, maintenance to be performed as well as lay-up/maintenance dates?<br><br>a. How is lay-up/ maintenance accomplished | (1) Documentation; maybe within separate Groups such as, BNI C&T CMMS, Subcontractor/Vendor documentation and/or BNI Construction documentation?<br><br>REFERENCE DOCUMENTS:<br>(1) 24590-WTP-GPP-CON-6201; para.3.3.4.11. This paragraph states that punch lists will be entered into PunchWorks identifying | Preservation and maintenance on equipment/systems not yet accepted by BNI is tracked and documented per the subcontractors program. BNI surveys subcontractors program and validates adequate performance during acceptance from subcontractor phase. Preservation and maintenance of BNI procured and installed equipment/systems as well as subcontractor provided equipment/systems accepted by |

**D-05-DESIGN-019, Revision 1 Questions/Inquiry Dated 12-1-05**

**"DESIGN OVERSIGHT"** BOF Equipment, Systems and Facilities Turnover Testing

| Question | Comment | Contractor Response |
|---|---|---|
| for equipment/systems within a facility that is managed by more then one Group such as (BNI Construction, Subcontractor, and BNI C&T)? Are separate equipment/system lists maintained or is there a master list?<br><br>b. How can the design oversight team obtain the lay-up documentation that shows (equipment, scheduled maintenance, and responsible party) for the equipment/systems identified in the Oversight Plan? | responsible individual and forecast completion date per item.<br>(2) 24590-WTP-GPP-GCB-00100 "Field Materials Management"<br>(3) 24590-WTP-GPP-CON-1602 "System and Area Completion and Turnover"<br>(4) 24590-WTP-GPP-CON-4103 "Subcontract Surveillance, Acceptance and Closeout" | BNI is tracked and documented in accordance with 24590-WTP-GPP-CON-6201. These programs identify the entity responsible for the maintenance as well as frequency information.<br><br>a) Design documents including subcontract documents identify scopes of work and establish responsibilities. There is not a master list covering all equipment/systems, BNI and subcontractor provided, undergoing preservation and maintenance.<br>b) Copies of typical documentation will be supplied. |
| (4) In addition to question 3, above, how are Manufacturer Recommendation (MR) Lay-up procedures being implemented and recorded? Are the MRs being implemented within BNI's overall lay-up procedures? | REFERENCE DOCUMENTS:<br>(1) 24590-WTP-GPP-CON-6201 "Equipment Preservation and Maintenance"<br>(2) 24590-WTP-RPT-CN-01-004 " Construction and Acceptance Testing Program" | Subcontractor and BNI utilize manufacturers recommendations in the development of preservation and maintenance programs. Manufacturers and/or subcontractor recommendations are contained in O&M manuals approved by engineering. |
| (5) Please send or show the Design Oversight Team how we can obtain punch lists for equipment/ systems that are identified in the Oversight Plan? How are these equipment/systems being tracked/ documented? Does the documentation identify who the responsible party | REFERENCE DOCUMENTS:<br>(1) 24590-WTP-GPP-CON-6201; paragraph 3.3.4.11. This paragraph states that punch lists will be entered into PunchWorks identifying responsible individual and forecast completion date per item.<br>(2) 24590-WTP-GPP-GCB-00100 "Field Materials Management" | Punch lists are developed during the acceptance process for specific scopes of work and captured in a database called PunchWorks. Currently, subcontracts is the primary user of PunchWorks as several subcontracts are in the acceptance process. Preliminary punch lists are available for the cooling tower, pumphouses, steam plant and FETs. Punch |

**D-05-DESIGN-019, Revision 1 Questions/Inquiry Dated 12-1-05**

**"DESIGN OVERSIGHT"** BOF Equipment, Systems and Facilities Turnover Testing

| Question | Comment | Contractor Response |
|---|---|---|
| is, work to be performed and when?<br><br>a. How is control established for equipment/systems within a facility that is managed by more then one group such as BNI Construction, Subcontractor, and BNI C&T?<br><br>b. Is there one data base that lists all of the punch list items? Document 24590-WTP-GPP-CON-7113 mentions that TEAMWorks and Setroute have punch list items.<br><br>c. How can we obtain document 24590-WTP-GPP-CON-1601 "Control of Punchlist Items" (was not able to obtain this on DocSearch). | (3) 24590-WTP-GPP-CON-1602 "System and Area Completion and Turnover"<br>(4) 24590-WTP-GPP-CON-4103 "Subcontract Surveillance, Acceptance and Closeout" | lists for subcontracts are considered final when BNI considers the scope of work sufficiently complete to grant a certificate of final acceptance. This has not occurred on any of the referenced subcontracts. U/G piping and the CCP are not yet near the punch listing stage.<br><br>The current cooling tower punch list is provided as an example. This example includes open and completed items identified since PunchWorks has been operational. Other PunchWorks reports are available upon request. |
| (6) Is there documentation that identifies procedures for Long Term Lay-up showing how BNI Engineering, BNI C&T and BNI Construction interface? | (1) The documentation that the Design Oversight Team has obtained, so far, does not reflect long term lay-up conditions. | Reference response to item 2) above. |
| (7) Which box/stage best depict where each equipment/system identified in the Oversight Plan is at within the flow charts (appendix 1 & 2) of | REFERENCE DOCUMENTS:<br>(1) 24590-WTP-GPP-CON-1602 "System and Area Completion and Turnover"<br>(2) 2) 24590-WTP-GPP-CON-4103 "Subcontract Surveillance, Acceptance | Appendix 1 - Boxes "Prepare System Scope Drawings" through "Develop Construction Schedule to Support SU" boxes best depict the status of the scope of the oversight plan.<br>Appendix 2 - Not yet on the chart |

**D-05-DESIGN-019, Revision 1 Questions/Inquiry Dated 12-1-05**

**"DESIGN OVERSIGHT"** BOF Equipment, Systems and Facilities Turnover Testing

| Question | Comment | Contractor Response |
|---|---|---|
| document 24590-WTP-GPP-CON-1602. | and Closeout" | for area turnovers. |
| (8) Which box/stage best depict where each equipment/system identified in the Oversight Plan is at within the flow charts (appendix 1) of document 24590-WTP-GPP-CON-4103. | REFERENCE DOCUMENTS:<br>(1) 24590-WTP-GPP-CON-4103 "Subcontract Surveillance, Acceptance and Closeout"<br>(2) 24590-WTP-GPP-CON-1602 "System and Area Completion and Turnover" | Subcontracts identified as part of the oversight plan are in the "Acceptance" phase depicted in the upper bottom half of appendix 1 of procedure 24590-WTP-GPP-CON-4103. |
| | | |
| | –END – | |
| | | |

# APPENDIX A

# DESIGN OVERSIGHT PLAN
# REVIEW OF BNI
# BALANCE OF FACILITIES (BOF)
# EQUIPMENT, SYSTEM AND FACILITY
# PRESERVATION, LAY-UP AND
# TURNOVER PROCEDURES

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

# DESIGN OVERSIGHT PLAN

## Review of BNI Balance of Facilities (BOF) Equipment, System and Facility Preservation, Lay-up and Turnover Procedures

November 01, 2005

**Design Oversight:** **D-05-DESIGN-019**

**Team Lead:** Mary Ryan

**Reviewer(s):** Carol Babel
John Orchard
James Adams

**Submitted by**

Team Lead: _____ Date _____
Mary A. Ryan

**Approved by:**

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

Project Manager Waste Treatment Plant: _____ Date _____
John R. Eschenberg

# 1.0 BACKGROUND, PURPOSE AND OBJECTIVES

## 1.1 Background

The Balance of Facilities (BOF) will be capable of providing cold chemicals, services and utilities to support the required throughput of the main production facilities, Pretreatment, High-Level Waste Vitrification, Low-Activity Waste Vitrification and the Analytical Laboratory.

• Utilities include systems steam, cooling water, process water and electricity.
Cold chemicals are those purchased for use in the Waste Treatment Plant and delivered and stored on site for application to the processing facilities. The BOF infrastructure and facilities are comprised of 20 buildings/systems that can be grouped into the following eight primary functional groups: power, steam, water, air, process support, waste facilities and misc. support buildings. The POWER group consists of three switchgear buildings, one diesel generator and two emergency diesel generators. The STEAM group consists of a steam plant and a fuel oil facility. The WATER group consists of cooling towers, water treatment facility and field erected water tanks, chiller/compressor facility and the firewater facility/tanks. The AIR group made up of the chiller/compressor plant. The PROCESS SUPPORT group consists of the glass former storage facility, wet chemical storage facility and the anhydrous ammonia storage facility. The WASTE facility group consists of the failed melter storage facility and the non-dangerous non-radioactive (NLD) effluent facility, pipelines and tanks, radioactive waste pipelines and NLD Air Stripper. MISC. support facility group includes the administration building, simulator facility, warehouse, maintenance shop and site infrastructure (roads, grading, lights, sanitary waste, storm drains, etc.).

## 1.2 Purpose

This design oversight will determine whether the Contractor has effective programs and procedures in place necessary to ensure adequate Subcontracted BOF equipment/systems and facility turnovers as well as effective short/long term lay-up prior to DOE ORP turnover. The effectiveness of the Contractor or subcontracted BOF equipment/systems and facility turnover and lay-up is dependent upon effective written programs/procedures and implementation of the programs/procedures.

## 1.3 Specific Objectives

1. Evaluate BNI and/or Subcontractor short-term/long-term lay-up procedures/plans implemented upon completion of the following BOF equipment/systems/facilities. (Jeffery Bruggeman and Josef Christ have been added as supporting reviewers, as shown below, and as their schedules allow.)

    - Steam Plant (equipment/system/facilities)
      ORP Design Oversight Reviewer is John Orchard and Jim Adams

    - Cooling Tower (equipment/system/facilities)

ORP Design Oversight Reviewer is Jim Adams

- Utility Piping and Field Erected Tanks/Pump houses (equipment/system/facilities)
  ORP Design Oversight Reviewer is Carol Babel and Jeffery Bruggeman

- Chiller Compressor Plant (equipment/system/facilities)
  ORP Design Oversight Reviewer is Mary Ryan and Josef Christ

2. Evaluate Turnover Procedures/Plans regarding BNI's acceptance of Subcontracted BOF (equipment/system/facilities).

   After completing the above, the Design Oversight Team should focus on assessing the adequacy and effectiveness of items 1.3.1 and 1.3.2 above as follows:

   - Evaluate the development of "punch-list" procedures and record keeping during performance of construction completion walk-throughs, prior to final acceptance of subcontractor work.
   - Evaluate the resolution and final Contractor acceptance of punch lists and procedures prior to final acceptance of subcontractor work.
   - Evaluate procedures, programs and implementation of preservation activities for BOF equipment, systems and facilities in lay-up.
   - Evaluate the training/qualification of personnel implementing the lay-up storage programs and procedures prior to Contractor turnover to DOE-ORP.
   - Evaluate the record keeping procedures demonstrating management of BOF equipment, systems and facilities during lay-up and turnover activities.
   - Evaluate the programs BNI is utilizing to manage documents such as Operations and Maintenance (O&M) and preservation data for BOF equipment, systems and facilities during lay-up and turnover activities.

## 2.0 Process

This oversight shall be conducted within the guidelines of ORP PD 220.1-12, "Conduct of Design Oversight".

### 2.1 Scope

This oversight shall include a review plan as well as information obtained concerning the Contractor and Subcontractor's turnover and lay-up procedures.

### 2.2 Preparation

1. Identify the BNI and ORP Points of Contact (POC) for this review.
   BNI POC is Jeff Wright

2. Transmit this plan to the points of contact and meet with appropriate personnel to review the plan and establish a working relationship to complete the review.
   Draft of Design Oversight Plan was transmitted to BNI POC on November 7, 2005.

3. Identify BOF Facilities/systems; and WTP Contract Requirements.

See paragraph 1.3.1.

4. Collect documentation, e.g., turnover and lay-up procedures/plans. Table 1 depicts information DOE ORP is requesting and supplied by the Contractor to initiate this Design Oversight.

2.3 **Review and identify, resolve, or document issues**

Evaluate BNI documentation and WTP Contract requirements. Develop lines of inquiry and specific questions that are explored with cognizant Contractor personnel to meet the oversight objectives. This phase will be documented in summary tables as shown in Attachment 1, Appendix A. This effort will include participating in applicable internal Contractor reviews, discussions and site visits. The output from this phase of the oversight will be a completed summary table with Contractor responses to the questions and lines of inquiry and a list of remaining open issues that need further evaluation by the Contractor for resolution.

2.4 **Reporting**

Brief DOE and Contractor management periodically as required and prepare a draft report that summarizes the activities, the results, conclusions, and recommendations of the review. The draft report will be issued for review and comment by DOE management and cognizant Contractor personnel. The final report will resolve comments received on the draft report.

## 3.0 WTP Contract Requirements DE-AC27-01RV14136

The documents provided by BNI, during this Design Oversight, will be reviewed in accordance with WTP Contract requirements. (A list of WTP Contract Requirements is shown in the following table.)

**WTP CONTRACT**
**DELIVERABLES and FAR CLAUSES**

| Standard 4: Construction, Procurement and Acceptance Testing | | | |
|---|---|---|---|
| Item Number | Deliverable | Contract Date | Note |
| **04.01** | **Construction, Procurement, and Acceptance Testing Plan** (DOE Concurrence) | as required | Std.4(a)(f)(3) & (i): for DOE concurrence |
| STD.4.(a) Contract Page C.43 & 45.... The Contractor shall prepare and submit a Construction, Procurement, and Acceptance Testing Plan for DOE concurrence (Table C.5-1.1, Deliverable 4.1) and update the Plan as required after initial submission. The Plan shall include... | | | |
| **04.02** | **Purchasing System** (DOE Approval) | as required | Std.4(b)(2): may have lay-up turnover info |
| STD.4.(b) Contract Page C.43....Contractor shall procure all required material and equipment, including: prepare bid packages and solicitations; evaluate, award, and manage subcontracts; accept | | | |

**WTP CONTRACT**
**DELIVERABLES and FAR CLAUSES**

| | | | |
|---|---|---|---|
| | subcontractor materials and equipment; and verify subcontractor acceptance tests..... | | |
| **04.03** | **Construction Bid and Work Package** (DOE Accept/Verify) | as required | Standard.4(c): as required |
| STD.4.(c) Contract Page C.43.... The Contractor shall prepare bid and work packages; solicit, evaluate, award, and manage subcontracts; accept subcontractor construction; and verify subcontractor acceptance tests (Table C.5-1.1, Deliverable 4.3)..... | | | |
| **04.04** | **Construction and Acceptance Testing Program** (DOE Concurrence) | prior to start of construction | Standard.4(f)(1): |
| STD.4.(f) Contract Page C.43/44.... The Contractor shall maintain an adequate construction inspection system and acceptance testing system, and perform such inspections and testing, as well as ensure that the work performed under the Contract conforms to Contract requirements. The Contractor shall maintain complete inspection and testing records and make them available to DOE. The Contractor shall develop and submit an integrated Construction and Acceptance Testing Program to DOE for concurrence (Table C.5-1.1, Deliverable 4.4) that includes the following elements:..... (ii) Acceptance test plans and procedures for on-site Contractor/subcontractor inspection of construction workmanship, compliance.....(iii) Identification and description of Contractor and vendor components to be tested and accepted including the identification of component, systems, and integrated facility testing; (iv) Inspection of construction to assure adherence to approved working drawings and specifications;..... (vi) Methods to complete field and laboratory tests to verify construction workmanship and materials, and equipment, and approved working drawings and specifications; (vii) Approaches and methods to troubleshoot and correct material acceptance and construction deficiencies; (viii) Preparation of partial, interim, and final estimates and reports of quantities and values of construction work performed, for payment or other purposes; (ix) Approach to transition from acceptance to facility cold commissioning and hot commissioning; and.....(x) Providing set(s) of reproducible "as-built" record drawings of the type specified by DOE and set(s) of marked-up specifications, showing construction as actually accomplished..... | | | |
| **04.05** | **Construction Overview Meetings** (DOE Overview) | on-going | Standard.4(h): |
| STD.4.(h) Contract Page C.45....U.S. Department of Energy Participation in Construction Review: The DOE staff, Tank Farm Contractor and other Hanford Site Contractor staff identified by DOE, shall be invited to participate in all overview activities (Table C.5-1.1, Deliverable 4.5 Construction Overview Meetings). Construction overview activities include any meeting that discusses significant issues associated with the establishment, development, and/or progress of the WTP construction. | | | |

FAR Clauses: Section I of WTP Contract

| Series Number | Clause Number and Title | Contract Page Number |
|---|---|---|
| 01.72 | FAR 52.236-5: Material and Workmanship (APR 1984) | Page 87 |

**WTP CONTRACT**
**DELIVERABLES and FAR CLAUSES**

1. ".....All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.
2. The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.
3. All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

## 4.0 DESIGN REVIEW REQUIRMENTS

The review team requirements for the performance of this Design Oversight Review are as follows.

1. Verify that BNI and Subcontractor lay-up and turnover procedures are sufficient in scope and will ultimately facilitate successful BOF facility and system turnovers.
2. Verify that BNI has preservation and maintenance, lay-up, and turnover procedures that are being implemented for BOF Subcontractor systems, equipment and facilities.
3. Verify that BNI has preservation and maintenance, lay-up, and turnover procedures that are being implemented for BNI constructed systems, equipment and facilities.
4. Verify that BNI has procedures for maintaining and turning over Operations and Maintenance (O&M) manuals and preservation data for BOF equipment, systems and facilities during lay-up and turnover activities.
5. The Design Oversight will be performed per ORP PD 220.1-12, 2/12/03, "Conduct of Design Oversight."

## 5.0 ENDPOINT

The design review endpoint is defined as, issuance of the final review/report by the Office of River Protection.

## 6.0 SCHEDULE

Table 2 summarizes the schedule for completion of this design oversight review.

## 7.0 DOCUMENTATION

The final report of this review shall contain the applicable sections and content as summarized in Attachment 1.

The open issues identified in this review shall be listed in the final report. Each open issue shall be assigned an item number and shall be tracked to resolution through CARS. These shall also be tracked to resolution by the Contractor through the CCN that will be assigned to the transmittal of the report from DOE to the Contractor.

## 8.0 CLOSURE

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

## 9.0 DOCUMENTATION

The final report of this task shall contain the sections and content as summarized in Attachment 1. The open issues identified in this oversight shall be listed in the final report. Each open issue shall be assigned an item number and shall be tracked to resolution through CARS. These shall also be tracked to resolution by BNI through the CCN that will be assigned to the transmittal of the report from ORP to BNI. See Table 1, Attachment 1.

## 10.0 REFERENCES

- WTP Contract No. DE-AC27-01RV14136
- FAR, dated July 1, 2004
- ORP/OSR (Inspection Technical Procedure) I-116, "Equipment Lay-Up and Maintenance Inspection", Rev 0, June 5, 2002
- A-05-AMWTP-RPPWTP-002-65, "WTP-Site Inspection; Inspector performed an adequacy and effectiveness review of the Contractor's equipment", May 18-19, 2005

**Table 1: "Initial Information Requirements"**

| | |
|---|---|
| 1.0 | Any plans or procedures describing acceptance of BOF system/equipment/facilities upon Contractor or Subcontractor construction completion. |
| 2.0 | Any plans or procedures describing BOF system/equipment/facilities for short-term/long-term lay-up upon BNI acceptance of BOF system/facilities from Vendor. |
| 3.0 | Any plan or procedures documenting the lay-up of BOF equipment/system/ facilities; such as, temperature regulation criteria for BOF equipment/systems. |
| 4.0 | Any Vendor information regarding O&M requirements for BOF completed systems/equipment/facilities. |
| 5.0 | Any punch lists describing already completed or in progress lists for any of the completed/near completed Contractor or Subcontractor BOF system/equipment/facilities. |
| 6.0 | A list of applicable source documents (Contract, DOE Guidance or Orders, etc.) that contain requirements applicable to the equipment/system/facility O&M manuals, Turnover, Lay-up and Testing." |
| 7.0 | Any Contractor review reports assessing their system/equipment/facilities for short-term/long-term lay-up upon BNI acceptance of BOF system/facilities from Vendor. |
| 8.0 | Any Contractor Internal Oversight/Surveillance previously completed regarding procedures/implementation governing Contractor/Owner or Contractor/Subcontractor system/equipment/facilities turnovers, short-term or long-term lay-ups. |
| 9.0 | Any CDRs or SDDRs regarding BOF Equipment/System/Facilities identified in para.1.3 Specific Objectives; sub-para.(1). (Any documented deficiency maintained in BNI's database regarding the quality of BNI and/or subcontractor's design/construction.) |

**Table 2: "Schedule"**

| Activity Description | Responsibility | Complete By Date or Time Bracket |
|---|---|---|
| Develop Oversight Plan | Ryan | 11/1/05 |
| Identify Team members | Ryan/Hamel | 11/1/05 |
| Advise BNI oversight and provide system oversight plan to identify needed BNI support | Ryan | 11/1/05 |
| Design Oversight Entrance Meeting | ORP Team/BNI | 11/16/05 |
| Collect Preliminary and Follow-up Information to Prepare for Oversight/Review. | ORP Team/BNI | 11/16/05 – 12/09/05 |

**Table 2: "Schedule"**

| Activity Description | Responsibility | Complete By Date or Time Bracket |
|---|---|---|
| ORP Team; WTP Site Visits/Inquiry (Team Members will notify BNI POC prior to site visit) | BNI and ORP Team Lead/Reviews | 11/29/05 – 01/31/06 |
| ORP/BNI Design Oversight Exit Meeting Date | ORP/BNI | 02/01/06 – 02/08/06 |
| ORP Individual Team Reviewers Prepare Report to ORP Team Lead | ORP Team Reviewers | 12/30/05 – 01/11/06 |
| ORP Team Lead Draft Design Oversight Report | ORP Team Lead and Reviewers | 01/25/06 – 03/31/06 |
| Resolve comments and issue Final Report | ORP Team | 03/31/06 – 04/17/06 |
| **NOTES**:<br>(1) Schedule subject to change through Design Oversight Team Lead.<br>(2) Team Lead will notify BNI POC of schedule changes as applicable. | | |

# Task# ORP-WTP-2006-0055

E-STARS™ Report
Task Detail Report
05/08/2006 0903

| TASK INFORMATION | | | |
|---|---|---|---|
| **Task#** | ORP-WTP-2006-0055 | | |
| **Subject** | CONCUR: (06-WTP-055) TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT D-05-DESIGN-019: REVIEW BECHTEL NATIONAL, INC.'S (BNI) BALANCE OF FACILITIES (BOF) EQUIPMENT, SYSTEM AND FACILITY PRESEVATION, LAY-UP AND TURNOVER PROCEDURES | | |
| **Parent Task#** | | **Status** | CLOSED |
| **Reference** | 06-WTP-055 / CARS 7662 | **Due** | |
| **Originator** | Almaraz, Angela | **Priority** | High |
| **Originator Phone** | (509) 373-0068 | **Category** | None |
| **Origination Date** | 03/30/2006 0922 | **Generic1** | |
| **Remote Task#** | | **Generic2** | |
| **Deliverable** | None | **Generic3** | |
| **Class** | None | **View Permissions** | Normal |
| **Instructions** | Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you.<br><br>bcc:<br>MGR RDG File<br>WTP OFF File<br>R. C. Barr, ESQ<br>J. J. Short, OPA<br>W. F. Hamel, WED<br>M. A. Ryan, WED<br>J. R. Eschenberg, WTP<br><br>RECORD NOTE:<br>Please scan the background information into IDMS but do not send to the Contractor. | | |

| ROUTING LISTS | | |
|---|---|---|
| 1 | Route List | Inactive |
| | | |
| | • Ryan, Mary A - Review - Concur - 04/03/2006 0959<br>*Instructions:* | |
| | • Hamel, William F - Review - Concur - 05/04/2006 1505<br>*Instructions:* | |
| | • Short, Jeff J - Review - Concur - 05/04/2006 1506<br>*Instructions:* | |
| | • Eschenberg, John R - Review - Concur - 05/04/2006 1507<br>*Instructions:* | |
| | • Schepens, Roy J - Review - Concur - 05/04/2006 1514<br>*Instructions:* | |
| | • Eschenberg, John R - Approve - Approved - 05/04/2006 1706<br>*Instructions:* | |

**ATTACHMENTS**

## Task# ORP-WTP-2006-0055

*No Attachments*

**COLLABORATION**

**COMMENTS**

| | |
|---|---|
| **Poster** | Almaraz, Angela (Almaraz, Angela) - 05/08/2006 0905 |
| | Task Re-Open |
| * | The letter and attachment will be rescanned into IDMS. Red line strikeout were included in the attachment, they are being taken out. |

**TASK DUE DATE HISTORY**

*No Due Date History*

**SUB TASK HISTORY**

*No Subtasks*

*-- end of report --*

# Task# ORP-WTP-2006-0055

E-STARS™ Report
Task Detail Report
03/30/2006 0304

## TASK INFORMATION

| | | | |
|---|---|---|---|
| **Task#** | ORP-WTP-2006-0055 06-WTP-055 | | |
| **Subject** | CONCUR: ~~(06-WED-021)~~ TRANSMITTAL OF U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP) DESIGN OVERSIGHT REPORT D-05-DESIGN-019: REVIEW BECHTEL NATIONAL, INC.'S (BNI) BALANCE OF FACILITIES (BOF) EQUIPMENT, SYSTEM AND FACILITY PRESEVATION, LAY-UP AND TURNOVER PROCEDURES | | |
| **Parent Task#** | | **Status** | Open |
| **Reference** | 06-WED-021 / CARS 7662 | **Due** | |
| **Originator** | Almaraz, Angela | **Priority** | High |
| **Originator Phone** | (509) 376-9025 | **Category** | None |
| **Origination Date** | 03/30/2006 0922 | **Generic1** | |
| **Remote Task#** | | **Generic2** | |
| **Deliverable** | None | **Generic3** | |
| **Class** | None | **View Permissions** | Normal |
| **Instructions** | Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you.<br><br>bcc:<br>MGR RDG File<br>WTP OFF File<br>J. J. Short, OPA<br>W. F. Hamel, WED<br>M. A. Ryan, WED<br>J. R. Eschenberg, WTP<br>R. Barr ESQ<br>RECORD NOTE:<br>Please scan the background information into IDMS but do not send to the Contractor. | | |

## ROUTING LISTS

1 Route List Active

- Ryan, Mary A - Review - Awaiting Response MAR-3-06
  *Instructions:*
- Hamel, William F - Review - Awaiting Response 4/5/2006
  *Instructions:*
- Short, Jeff J - Review - Awaiting Response 4/8/06
  *Instructions:*
- Eschenberg, John R - Review - Awaiting Response 4/9 w/changes
  *Instructions:*
- Schepens, Roy J - Review - Awaiting Response 5/4/06
  *Instructions:*
- Eschenberg, John R - Approve - Awaiting Response
  *Instructions:*

Reid 4/9

## ATTACHMENTS

Background
06-WTP-055

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

## Design Oversight Report

## Review
## Balance of Facilities (BOF)
## Equipment, System and Facility
## Preservation Lay-Up and Turnover

## March 2006

## Design Oversight: D-05-DESIGN-019

**WED:MAR**
**March 30, 2006**

Mary A. Ryan

DESIGN OVERSIGHT NOTE

Design Oversight Note Number: **D-05-DESIGN-019 MAR.1**

Assessors Names(s): **Mary A Ryan** Dates of Inspections/Assessments **JAN/FEB-2006**

Area/Items(s) Reviewed: **Chiller Compressor Plant Equipment** (BNI Lay-up and Turnover of Balance of Facility Systems)

**1.0 Overview**: I reviewed the contractor and subcontractor documentation of Balance of Facility (BOF) Chiller Compressor Plant and conducted interviews with the contractor BNI-management and field staff relative to the lay-up, preventative maintenance and turnover/testing of equipment/systems and CCP equipment/system. The Chiller Compressor Plant equipment was assessed in accordance with the *BOF Equipment, Systems and Facilities Turnover Testing* assessment plan - number D-05-DESIGN-019 and Contract No. DE-AC27-01RL14136 requirements.

The Oversight Review Team as a whole reviewed the procedures and documentation associated with the Preventative maintenance (PM), Lay-up and Turnover of the BOF Chiller Compressor Plant (CCP) Equipment, Steam Plant, Cooling Tower, Field Erected Tanks, Pump Houses and Underground Piping.

**2.0 Engineering, Construction, C&T Management Documents Reviewed**:
24590-WTP-PL-MG-01-002, Rev 3, WTP Configuration Management Plan, dated June 28, 2005
24590-WTP-PL-G-01-002, Rev 0, Commissioning Plan Part "A", dated June 28, 2005
24590-WTP-GPP-CON-6201, Rev 4, Equipment Preservation and Maintenance, dated June 28, 2005
24590-WTP-PL-ENG-05-007, Rev 0, Component Information System (CIS) Project Plan, dated Jan 23, 2006
24590-WTP-GPP-CON-3607, Rev 2, Operation of Systems under Construction Custody, *dated November 1, 2005*
24590-WTP-RPT-CN-01-004, Rev 1, Construction and Acceptance Testing Program, dated November 15, 2003
24590-WTP-GPP-CON-4103, Rev 0, Subcontract Surveillance, Acceptance, and Closeout, dated July 24, 2004
24590-WTP-RPT-CN-01-001, Rev 0, Construction, Procurement and Acceptance Testing, dated July 02, 2001
24590-WTP-GPP-CON-7113, Rev 1, Construction Record Completion, dated July, 20, 2005
24590-WTP-GPP-CON-1602, Rev 0, System and Area Completion and Turnover, dated March 16, 2005
24590-WTP-RPT-CN-01-004, Rev 1, Construction and Acceptance Testing Program, dated November 15, 2003
24590-WTP-GPP-CON-4101, Rev 8, Construction Subcontract Management, dated January 11, 2006
24590-WTP-GPP-CON-7105, Rev 2, Subcontractor Submittals, dated October 13, 2004
24590-WTP-GPP-MGT-0013, Rev 4, Acceptance of Procured Material, dated February 21, 2005
24590-WTP-GPP-GCB-0100, Rev11, Field Materials Management, dated April 15, 2005
24590-WTP-GPP-PSQ-0050, Rev 3, Receiving Inspection, dated September 30, 2005
24590-WTP-GPP-CON-7110, Rev 4, Material Receiving Instructions, dated July 28, 2005
24590-WTP-GPP-CON-7109, Rev 5, Material Control, dated August 11, 2005
24590-WTP-GPP-CON-7101, Rev 7, Construction Quality Control Program, dated October 27, 2005
24590-WTP-IAR-QA-05-0009, Rev 0, Field Engineering and QC and Quality Control, dated Oct 31, 2005
24590-WTP-RPT-OP-01-001, Rev 2, Operations Requirements Document, dated May 5, 2003
24590-WTP-GPP-CON-1201, Rev 4, Construction Work Packages, dated January 29, 2004
24590-WTP-GPP-CON-3103, Rev 9, Field Change Requests/Field Change Notices, dated Nov 23, 2005
24590-WTP-GPP-CON-3106, Rev 5, Construction Deficiency Reporting & Control, dated December 29, 2004
24590-WTP-GPP-CON-7104, Rev 6, Nonconformance Reporting & Control, dated October 27, 2004
24590-WTP-3DP-G03B-0004, Rev 5, Standard Component Numbering, dated November 29, 2005
24590-WTP-3DP-G04B-00058,Rev 4, Supplier Engineering and Quality Verification Doc, dated Aug 01, 2005
24590-WTP-3DP-G04B-00049,Rev10, Engineering Specifications, dated Sept 30, 2005
24590-WTP-3DP-G06B-00002, Rev 5, Subcontracts, dated Aug 01, 2005
24590-WTP-GPP-GPX-00602, Rev 3, Subcontract PO Modification and Changes, dated January 23, 2006
24590-WTP-GPP-AS-001, Rev 3, Purchasing Flow Process, dated May 31, 2005
24590-NP-SRA-HX00-00009-02-00008, Rev.00B CHAMPS document, dated 9-15-05
06-WED-001, Protection, ORP to BNI Preservation and Maintenance of Government Property, dated Jan 26, 2006
CCN: 132371, Initial Response BNI to ORP Preservation/Maintenance of Government Property, dated Jan 26, 2006

**O&M and/or PM and/or Lay-up Document for the CCP Equipment**
24590-CM-POA-MCCA-00001-16-00001 – O&M; Centrifugal Air Compressors
24590-CM-POA-MCCA-00001-16-00002 – O&M; Centrifugal Air Compressors
24590-CM-POA-MCCA-00001-08-00004 – PM; Rotary Screw Compressors
24590-CM-POA-MCCA-00001-10-00014 – PM; Compression Air Dryers
24590-CM-POA-MCCA-00001 – Prefix number for other Vendor Documents on docSearch.
24590-CM-POA-MERK-00001-09-00017 – Long Lay-up; Centrifugal Chillers

**3.0 ORP INSPECTION NOTES** and other applicable ORP or BNI assessments:

3.0.a ORP Field Inspections or Assessments

A-05-AMWTP-RPPWTPP-002-65, dated *May 18-19, 2005*; ORP Inspector RI Taylor, dated May 18/19, 2005 = this inspection included long-term storage and maintenance for BOF Centrifugal Air Compressors PSA-CMP-00001A, PSA-CMP-00001B, PSA-CMP-00001C located on the Chiller Compressor Pad. **The Report Noted**: With the exception of valves very little equipment had arrived on site to date requiring PM activities. The Contractor had developed a C&T Maintenance Organization for PM activities of equipment received at the WTP site, Marshaling Yard and other interim storage facilities. BNI had additional Long term Lay-up questions, regarding the Air Compressors listed above, long-term/PM activities were on hold until an answer was received. The ORP inspector contacted the Vendor which specifically stated Long term storage did not need to be performed for at least 90 days from receipt of equipment. ORP inspector did not have immediate concerns; however, noted that PM activities will be tracked as assessment follow-up item A-05-AMWTP-RPPWTP-002-A13.

A-05-AMWTP-RPPWTPP-004-34 dated *Nov 7, 2005*; the ORP inspector performed a review of the preservation and maintenance provisions of the BOF centrifugal air compressors for closure of assessment follow-up item A-05-AMWTP-RPPWTP-002-A13 from Inspection Note A-05-AMWTP-RPPWTP-002-65. During the previous inspection, BOF Centrifugal Air Compressors PSA-CMP-00001A, 00001B, 00001C, and 00001D were found to not have an acceptable long-term preservation and maintenance plan in place. Although the inspector noted improvements in PM activities, there were still concerns regarding required PM's such as, the loss of power for a period of time which prevented the CCP Centrifugal Air Compressor oil from being heated, as required, to prevent condensation (BNI wrote 24590-WTP-CDR-CON-05-0228 was written concerning this; entry date Nov 10, 2005). An additional CDR was written 24590-WTP-CDR-CON-06-0016 regarding the Centrifugal Air Compressors, entry date

3.0.b BNI Inspections/Assessments

24590-WTP-IAR-QA-05-0009, rev 0, dated *Oct 31, 2005*; paragraph 4.8 titled *Equipment Preservation and Maintenance* this audit looked at the C&T organization's preservation and maintenance process. No issues were noted.

**4.0 PREVIOUS FINDINGS and FIELD INSPECTIONS (Regarding CCP)**
Oct 1 – Dec 30, 2005 On-Location Field Quarterly Inspection Report A-05-AMWTP-RPPWTP-004 DOE-ORP

ORP Letter 06-WTP-001; Finding A-05-AMWTP-RPPWTP-004-F03 previously identified for failure to implement Contract requirements regarding maintaining plant equipment [Contract DE-AC27-01RV14136, Section I.88, FAR 52.245-5, section (e) *Property administration,* subsection (2)], was closed. Specifically, BNI was not maintaining the BOF Centrifugal Air Compressors in accordance with 24590-CM-POA-MCCA-00001-10-00010, *Atlas Copco Long Term Storage Procedure WI-108,* Revision 7. (Inspection Note 004-34.)

Previous ORP Field Inspections
A-05-AMWTP-RPPWTP-004-34 (assessment of follow-up item A-05-AMWTP-RPPWTP-002-A13 from inspector note A-05-AMWTP-RPPWTP-002-A65) PM deficiencies with BOF Centrifugal Air Compressors PSA-CMP-00001A, 00001B, 00001C and 00001D were recorded. BNI wrote CDR see paragraph 5.0.a.

A-05-AMWTP-RPPWTP-002-65 (adequacy of effectiveness review follow-up item no. A-05-AMWTP-RPPWTP-002-A13 was assigned to track questions regarding PM requirements with BOF Centrifugal Air Compressors PSA-CMP-00001A, 00001B, 00001C and 00001D).

**5.0 Adequacy and Effectiveness** of the Lay-up and Turnover/Testing for the CCP equipment as identified within Paragraph 2.0 of the *BOF Equipment, Systems and Facilities Turnover Testing* assessment plan - number D-05-DESIGN-019.

**NOTE**: Currently, the Chiller Compressor Plant (CCP) equipment is on site and the building structure, shell and utilities are in the process of being constructed. This assessment addresses the equipment only. The CCP equipment is a direct BNI procurement (not a BNI procured subcontract); therefore the PM's are administered by the BNI/WGI C&T Group versus being completed by BNI Construction or subcontractor. BNI procured subcontract PM's are administered by the subcontractor overseen by BNI Construction. The C&T group utilizes the *Equipment Preservation and Maintenance Operations procedure no.* 24590-WTP-GPP-CON-6201, and the *Operation Requirements Document* 24590-WTP-RPT-OP-01-001 as an (O&M) guide/basis for equipment PM's required.

5.0.a **Evaluate development of "punch list" plans/procedures/record keeping implemented during construction completion walk-throughs prior to final acceptance of subcontractor work** = all of the CCP equipment are BNI direct procurements. BNI Craft-Work Forces are erecting the building structural steel, shell and utilities.

- ***Punch List:*** *The building structure and shell is in the process of being constructed; the CCP equipment is on the CCP basemat/foundation. Since the equipment is BNI direct purchased items any issues regarding the CCP Equipment are tracked via UOS&D's* = *(*Unsatisfactory, Over, Short or Damaged Report) *and/or CDRs)* versus punch lists. Methods/procedures are as follows: (1) BNI Procurement tracks issues such as warranty items and/or defective/damaged equipment identified during delivery or upon delivery using the UOS&D and/or by (2) C&T through CDRs after delivery. Below is a list of defective/damage equipment issues that are being tracked by UOS&D's and/or CDR's.

  **UOS&D and CDR** written for CCP Equipment:
  UOS&D Procedure is defined and implemented via the BNI procedure no. *24590-WTP-GPP-GCB-00100 "Field Materials Management" (FMM) para.3.3.* This procedure is utilized for warranty/damage/defective equipment. Per the FMM procedure CDRs may also be written along with UOS&D's.

  - 24590-WTP-CDR-CON-05-0138 and 24590-WTP-UOS&D issued on CHILLERS – CDR titled "*Loss of N2Purge during Shipment of CCP Chillers" (broken gauges damaged in transit);* Damaged was observed prior to units being received; damage documented/tracked via CDR and UOS&D. *The gauges are not a permanent part of the chillers; they were installed to monitor the nitrogen purge on the units.* Disposition: *Replacement gauges were provided by the vendor and installed by craft on site.*

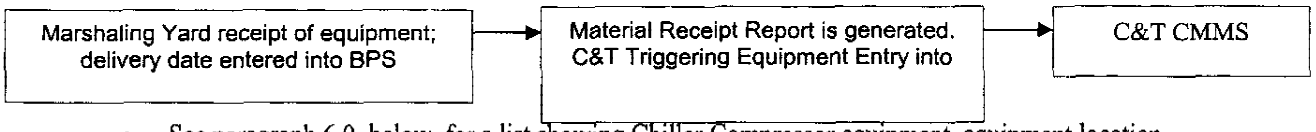
  Maintenance CDRs Procedure BNI procedure number *24590-WTP-GPP-CON-3106 – Construction Deficiency Reporting & Control (CDR).*

  - 24590-WTP-CDR-CON-05-00202 DRYERS –"Heat-of-Compression Dryers" factory welding defects on all dryers; currently at Parsons in Pasco, WA to fix factory welding defects.

- 24590-WTP-CDR-CON-05-00228; PO# -CM-POA-MCCA-00001-02-02; Atlas; *Storage and maintenance requirements for four centrifugal compressors were not met for the month of October 2005.*
- 24590-WTP-CDR-CON-06-0016 BOF Oil Temperature for Centrifugal Air Compressors; during routine storage maintenance temperatures were found to be outside manufacture specifications." *The oil heater must remain energized in a manor such that the oil temperature is maintained between 70F and 150F at all times to prevent condensation from forming in the lube oil system". Contrary to this requirement, during routine maintenance the oil temperature in each of the 4 units was measured at ~210 F with calibrated temperature gauge from the Construction M&TE* program" *"it was determined that the oil heater was left in "manual" mode rather than "auto" mode when the heater was energized in late December 2005. There is no indication that the thermostats or the oil sump temperature gauges installed on the Compressors were calibrated by the vendor. The thermostat on the heater was place in "auto" mode on 1/25/06 when the discrepancy was identified. After allowing the sump temperature to stabilize over the weekend, the temperature was measured as 58 deg F using the uncertified gauge built in to the sump."*

- **Punch List for the CCP Facility/Systems**: Since the building structure, shell and utilities are in the process of being constructed, a final punch list maybe generated for items needing resolution during the building/system completion walkthrough.

- **CCP Procedures/Record Keeping** – During WTP Site Meeting on 31JAN06 with Tim Dallas and Jim Lynch, BNI C&T, I was able to see the CMMS database which lists all equipment/components within C&T. We discussed CCP equipment and how/when equipment is entered into CMMS. The following is a basic flowchart depicting the direct procured equipment entry into C& T's CMMS system:




  - See paragraph 6.0, below, for a list showing Chiller Compressor equipment, equipment location and maintenance schedule.

  - I reviewed a print-out of the weekly (1/30 to 2/2) report generated by C&T from the CMMS database. These reports are used to generate work orders for preventative maintenance activities. Annual, Monthly, etc PM reports are also generated from CMMS.
    NOTE: I found the weekly report to be an *extensive list describing CMMS ID number, equipment description, class, required date, equipment number, PM assign to craft-worker and department/area-facility.* I also received 5-five "Work Orders" that were generated from CMMS Data Base for required PM's. I found the work orders to contain all the information as listed within paragraph 3.3 of C&T procedure *Equipment Preservation and Maintenance* 24590-WTP-GPP-CON-6201, Rev 4:
      - *24590-WTP PWO-CMNT-05-1041; CCP – Oil Free Rotary Screw Compressors. Generated for performance of annual PM.*
      - *24590-WTP PWO-CMNT-05-1762; CCP – Chiller. Generated for Monthly PM*
      - *24590-WTP PWO-CMNT-06-0214; CCP – Centrifugal Air Compressor. Generated for monthly PM.*
      - *24590-WTP PWO-CMNT-06-0294; CCP – Centrifugal Air Compressor. Generated for weekly PM.*
      - *24590-WTP PWO-CMNT-06-0295; CCP – Oil Free Rotary Screw Compressors. Generated for bi-monthly PM.*

  - C&T/CMMS: 24590-WTP-GPP-CON-6201 "Equipment Preservation and Maintenance" governs BNI direct purchased equipment or subcontracted facilities/systems that have been accepted by construction and turned over to C&T after issuance of letter "Certificate of Final

Acceptance" to subcontractor. Currently, no subcontracted facilities or systems have been turned over to C&T.

5.0.b **Evaluate "punch list" resolution** and final Contractor acceptance plans/procedures and record keeping activities prior to final acceptance of subcontractor work = The CCP equipment is not a subcontracted procurement. *Since the equipment is procured directly by BNI the UOS&D and CDR procedure serves as punch list resolution*. I have found BNI/WGI to be proactive in implementing and resolving CDR's or UOS&D's for damage or defective equipment. (See paragraph 3.0.a above)

**CMMS**: BNI/WGI C&T utilizes the Computerized Maintenance Management System (CMMS) database to evaluate procured equipment and establish long-term storage and periodic maintenance requirements. CMMS systematically schedules maintenance based on vendor, supplier and engineering requirements which are directly accessed through links to other BNI databases via manual or electronic data transfer links. Work orders (WO) planner is linked from CMMS to PDC for associated documents. This system identifies the type and frequency of routine maintenance required; work orders are established via WO Planner. There is a grace period for required PM's +/- 7-seven days (+/- 25%). The CCP equipment is tracked within this system.

5.0.c **Evaluate procedures and programs** implementing preventive maintenance activities = for the CCP equipment the PM activities are tracked and administered by BNI/WGI C&T Group through utilization of CMMS. Although there have been some CDR's written, as described above, in paragraph 3.0.a, the CMMS administered by C&T is successful for component based PM's. The CCP equipment is component based versus system or facility. Areas that still need to be address are:

- All data regarding BNI systems/facilities and subcontracted systems/facilities need to be migrated into CMMS before turnover to C&T; and C&T/CMMS needs to proficiently manage facilitate PM's/Lay-ups for components as well as systems and facilities.
- Long Term Storage Needs to be assessed, defined and implemented.

5.0.d **Evaluate the training and qualification of personnel implementing** the short or long-term storage programs and procedures prior to Contractor turnover to DOE-ORP = The CMMS system is component based which C&T administers and performs manufacturer required PM's for the CCP equipment. I've reviewed the CMMS system, PM lists, work orders, PM logs, CDR's, CAR's and UOS&D's for the CCP equipment and found that, for component based equipment, C&T has routinely identified and performed the required PM activities. This entails identifying equipment, location, PM activities, equipment class, PM dates and trained/qualified personnel. The overall weekly, monthly, etc schedules reflect that C&T has adequately identified personnel per area of discipline to perform each PM scheduled. In addition, this information can be easily reviewed, when requested.

NOTE: CMMS system is an excellent system that is currently being utilized to perform required PM's for component based equipment. BNI/WGI needs to define and implement a *short-term/long-term storage* program not only for component based equipment but also for facilities and systems that will be turnover to C&T upon construction completion of systems and subcontracts.

5.0.e **Evaluate the record keeping procedures/plans** demonstrating management of BOF equipment/systems and facilities during short/long term lay-up and turnover activities = C&T's record keeping system is through the CMMS database. BNI, as a whole stores, equipment data in multiple sources such as Component Information System (CIS), InTools, BPS, Plant Item List (PIL), PING, PipeWorks, TeamWorks, SetRoute, LIMS, Solid Edge, 3D Model, Conrad (Altris, MSAccess–Construction equipment. These data bases interface with custom tables within CHAMPS CMMS. These system are inter-linked and BNI can record and access data in a uniform manner to create or update CMMS equipment records.

- C&T has demonstrated an effective system (CMMS) and record keeping procedures for component based equipment, such as the CCP equipment, that has been directly procured by BNI.

- C&T utilizes the CMMS system, which has access to other BNI databases, to produce weekly, monthly, etc logs to track required PM activities. The CMMS system is also used to develop and implement scheduled PM Work Orders.

5.0.f **Evaluate the record keeping procedures**/plans demonstrating management of documents such as Operations and Maintenance (O&M) documents regarding BOF equipment/systems/facilities during short/long term lay-up and turnover activities = I reviewed the CCP equipment within the CMMS system and how the CMMS system aids in tracking O&M PM requirements. In addition, I reviewed the *Operations Requirements Document* no. 24590-WTP-RPT-OP-01-001 and the *Equipment Preservation and Maintenance* procedure no. 24590-WTP-GPP-CON-6201. These d*ocument/procedures are* used as the (O&M) guide/basis for designing and planning O&M documents/procedures (such as procedures, PM planning, staffing, and training). The maintenance program establishes the requirements for maintaining equipment and systems.

- C&T has effectively demonstrated storing and tracking all records including O&M documentation for *component based equipment* directly purchased by BNI procurement.
- The maintenance organization (C&T) is responsible for the condition of all equipment, systems and facilities once turned over to the C&T group. BNI Engineering is responsible for defining O&M information which is one element within the development of equipment/system/material procurement packages. However, before finalizing these packages engineering requests input from other multi-discipline groups within the BNI organization, such as C&T, prior to finalizing the procurement packages. (Reference engineering procedures Document no. 24590-WTP-3DP-G04B-00058 and Subcontracts Document no. 24590-WTP-3DP-G06B-00002) O&M specific vendor data is required to support operations, preservation, maintenance, testing, and training programs. C&T needs procedures and time to access, obtain and store this information in the CMMS database before BNI direct purchase systems and/or subcontractor closeouts are finalized. This will help to ensure that there will not be a lag in required maintenance activities.
- I observed how CMMS functions using the Chiller Compressor Plant equipment as an example; a printout was provided showing the equipment and status of the CCP equipment within the CMMS database. I observed where and how O&M data was accessed for the CCP equipment within the CMMS database. In addition, I received copies of individual work orders that had been completed.

  NOTE: BNI has developed procedures for *component based procurements*; however, they need to develop procedures on how PM's and long term storage of systems and subcontracted systems/facilities will be evaluated, tracked and implemented upon turnover s from BNI construction and the subcontractor.

**6.0 Equipment Observations and Assessments** = below is a summary of CCP equipment and Site Walkthrough information.

6.0.a CCP Equipment currently at the WTP Site or in Marshaling Yard.

| CHILLER COMPRESSOR PLANT | PLANT EQUIPMENT NUMBER | EQUIPMENT LOCATION | In CMMS | MAINTANCE SCHEDULED | MAINTANCE UP TO DATE ** |
|---|---|---|---|---|---|
| **Centrifugal Chillers *** | | | | | |
| Chiller | CHW-CHU-00001A | Building 82 | Yes | Monthly | Yes |
| Chiller | CHW-CHU-00001B * | Building 82 | Yes | Monthly | Yes |
| Chiller | CHW-CHU-00001C * | Building 82 | Yes | Monthly | Yes |
| Chiller | CHW-CHU-00001D * | Building 82 | Yes | Monthly | Yes |

| CHILLER COMPRESSOR PLANT | PLANT EQUIPMENT NUMBER | EQUIPMENT LOCATION | In CMMS | MAINTANCE SCHEDULED | MAINTANCE UP TO DATE ** |
|---|---|---|---|---|---|
| Chiller | CHW-CHU-00001E * | Building 82 | Yes | Monthly | Yes |
| Chiller | CHW-CHU-00001F * | Building 82 | Yes | Monthly | Yes |
| * See para.3.0.a above; 24590-WTP-CDR-CON-05-0138 and UOS&D on CHILLERS – broken N2 Purge gauges | | | | | |
| **Centrifugal Compressors*** | | | | | |
| Compressor | PSA-CMP-00001A * | Building 82 | Yes | Weekly<br>Monthly | Yes<br>Yes |
| Compressor | PSA-CMP-00001B * | Building 82 | Yes | Weekly<br>Monthly | Yes<br>Yes |
| Compressor | PSA-CMP-00001C * | Building 82 | Yes | Weekly<br>Monthly | Yes<br>Yes |
| Compressor | PSA-CMP-00001D * | Building 82 | Yes | Weekly<br>Monthly | Yes<br>Yes |
| *See para.3.0.a above; 24590-WTP-CDR-CON-05-0228 and 24590-WTP-CDR-CON-06-0016 (both CDR *regarding Maintenance)* | | | | | |
| **Rotary Screw Compressors** | | | | | |
| Compressor | PSA-CMP-00002A | Building 82 | Yes | 2 Week<br>Annual | Yes<br>Yes |
| Compressor | PSA-CMP-00002B | Building 82 | Yes | 2 Week<br>Annual | Yes<br>Yes |
| Compressor | PSA-CMP-00002C | Building 82 | Yes | 2 Week<br>Annual | Yes<br>Yes |
| **Heat-of-Compression Dryers *** | | | | | |
| Dryers | PSA-DRY-00001A * | Building 82 | Yes | Monthly | Yes<br>Yes |
| Dryers | PSA-DRY-00001B * | Building 82 | Yes | Monthly | Yes<br>Yes |
| Dryers | PSA-DRY-00001C * | Building 82 | Yes | Monthly | Yes<br>Yes |
| Dryers | PSA-DRY-00001D * | Building 82 | Yes | Monthly | Yes<br>Yes |
| Dryers | PSA-DRY-00001E * | Building 82 | Yes | Monthly | Yes<br>Yes |
| * *See para.3.0a above; 24590-WTP-CDR-CON-05-0202 DRYERS – "Heat-of-Compression Dryers" for Factory Welding Defects.* | | | | | |
| **Air Receivers Vessels** | | | | | |
| Vessel | PSA-VSL-00004 | Building 82 | Yes | Monthly | Yes |
| Vessel | PSA-VSL-00005 | Building 82 | Yes | Monthly | Yes |
| **Expansion Tank** | | | | | |
| Vessel | CHW-VSL-00030 | Building 82 | Yes | Monthly | Yes |
| **Chemical Feed Tank** | | | | | |
| Vessel | CHW-VSL-00002 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| **Air Separator Vessel** | | | | | |

| CHILLER COMPRESS OR PLANT | PLANT EQUIPMENT NUMBER | EQUIPMENT LOCATION | In CMMS | MAINTANCE SCHEDULED | MAINTANCE UP TO DATE ** |
|---|---|---|---|---|---|
| Vessel | CHW-VSL-00001 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| CHW-RK | CHW-RK-00001B | Part of Vessel Skid | No | No | NA |
| **NLD-CCP Sumps** | | | | | |
| Sump | NLD-PMP-00021 | HLW -31 foot Level | Yes | Not required by Vendor manual | NA |
| Sump | NLD-PMP-00026A | New Ship Date = 04/18/06 | No | No | NA |
| Sump | NLD-PMP-00026B | New Ship Date = 04/18/06 | No | No | NA |
| **HVAC Silencer Equipment** | | | | | |
| PSA Silencers | PSA-SIL-00001 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Silencers | PSA-SIL-00002 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Silencers | PSA-SIL-00003 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Silencers | PSA-SIL-00004 | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| **HVAC Centrifugal Compressor Air Intake Filters** | | | | | |
| PSA Air Intake Filter | PSA-FLTH-00001A | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Air Intake Filter | PSA-FLTH-00001B | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Air Intake Filter | PSA-FLTH-00001C | Marshalling Yard | Yes | Not required by Vendor manual | NA |
| PSA Air Intake Filter | PSA-FLTH-00001D | Marshalling Yard | Yes | Not required by Vendor manual | NA |

** The "*Maintenance up to Date*" column reflects that equipment is scheduled within C&T's CMMS system and PM's are being performed. There have been some inconsistency with PM's completions for some of the equipment (as noted), in particular the Centrifugal air Compressors. However, all equipment is within C&T's CMMS system and PM inconsistencies are being resolved.

6.0.b Site Visit information; 26JAN06/31JAN06/07FEB06 Currently the following Protection of Equipment are visible.

- AIR CHILLERS: The chillers had individual tarp coverings over each unit. Although the coverings enclosed most of the equipment there were still gaps/wholes visible, thus enabling dirt and sand to damage equipment. (NOTE: previously these compressors were not covered or had only loosely covered with tarp)
- ROTARY SCREW COMPRESSORS: The compressors previously had individual tarp coverings over each unit. Now units have better protection with scaffolding framed over all of the units and tarp/covering over the scaffolding. This allows workers to perform PM's/work on all 3 compressors at once while still being protected. Although, there were some entry openings/gaps most of the equipment was covered due to the type of cover/protection system. (NOTE: previously these compressors were not covered or were loosely covered with tarp)
- CENTRIFUGAL COMPRESSORS: The compressors previously had individual tarp coverings over each unit. Now units have better protection with scaffolding framed over all of the units and

tarp/covering over the scaffolding. This allows workers to perform PM's/work on all 4 compressors at once while still being protected. Although, there were some entry openings/gaps most of the equipment was covered due to the type of cover/protection system. (NOTE: previously these compressors were not covered or were individually loosely covered with tarp)

- HEAT-of-COMPRESSION DRYERS: Were not covered by individual tarps but are currently off site for welding repairs.
- CHEMICAL FEED TANKS: Not covered
- CCP BUILDING and UTILITIES: The structural still is being erected for the building exterior and the pipe rack.

**7.0 Meeting and Field Notes**

ATTACHMENT 01 – miscellaneous notes regarding CCP Equipment review as well as BOF facility and systems.

**8.0 Conclusion:**

8.0.a BNI/WGI C&T Group is implementing preservation and maintenance activities per procedure 24590-WTP-GPP-CON-6201 "Equipment Preservation and Maintenance" effectively for the *direct procured BNI Equipment, such as Chiller Compressor Equipment*. C&T and CMMS database system is organized to manage component based equipment; since the CCP equipment is component based versus system/facility the equipment was easily incorporated and tracked within CMMS. PM schedules and work orders are identified and implemented utilizing the CMMS system. Although there have been some CDR's and CAR's written, as described above, C&T's administration of the CMMS database, and implementation of the preservation and maintenance program for the CCP equipment is successful.

- The CCP Building that is currently being constructed over the CCP equipment along with utility systems will need to be turned over to C&T upon CCP facility completion. One open item is how BNI/WGI C&T will develop and implement procedures to accept facilities/systems and implement the required *maintenance or short term/long term lay-up* for the equipment, facility and/or Systems.

  NOTE: all data regarding BNI systems/facilities and subcontracted systems/facilities need to be migrated into CMMS before turnover to C&T; and C&T/CMMS needs to be empowered to proficiently facilitate PM's, short or long term lay-up for components as well as facilities and systems.

8.0.b Due to the length of time that BNI/WGI will be in control of the equipment/facilities/systems before turnover to the DOE, BNI/WGI needs to define and implement a *long-term storage/maintenance* program not only for component based equipment but also for facilities and systems that will be turnover to C&T upon completion of the subcontracts. Long Term Storage needs to be assessed, defined and implemented for the CCP equipment as well as all components, systems and facilities.

8.0.c Even though there have been some inconsistencies with PM completions, all CCP equipment is within the C&T CMMS system and C&T is proactively working to resolve all issues regarding PM requirements.

8.0.d The C&T group is in the process of rewriting the Equipment *Preservation and Maintenance* procedure, document number 24590-WTP-GPP-CON-6201. This procedural update will be completion is tentatively scheduled in March 2006.

**Submitted By:** *Mary Ryan* **Date:** 24-February-06

**Personnel Interviewed:**

BNI:
W. Clements
J. Roth
J. Wright
T. Dallas
B. Lynch
T. Burks
S. Polvi

ORP:
B. Taylor
J. Christ
L. Pacheco

ORP Assessment Team Members:
C. Babel
J. Orchard
J. Adams

ATTACHMENT 01

Meeting/Field Notes:

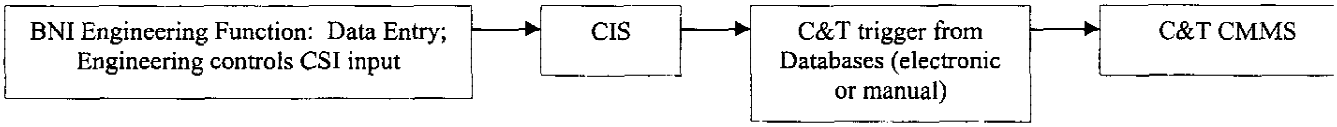
Below is a summary of the 07FEB06 WTP site meeting. This meeting was requested in an effort to obtain information and finalize ORP Engineering Division's assessment titled BOF Equipment, Systems and Facilities Turnover Testing, number D-05-Design-019.

1. GLOBAL **BNI ENGINEERING/CIS/C&T CONCERNS**:

NOTE: BNI stated, tracking data entry into CIS for subcontracted facilities/systems is on BNI's Top 10 List

- BNI ENGINEERING/CIS/CMMS: BNI Engineering is responsible for entering all **subcontracted** facility documentation/submittals into Component Information System (CIS) before facility/system turnover to C&T. Currently the subcontract data is not adequately being entered into the CIS database.

✓ C&T utilizes CIS data, via link with CMMS, in order to track and perform preventative maintenance. If this information is not in the computer system C&T will not be able to adequately maintain subcontracted equipment/systems once construction turnover to C&T occurs.




NOTE

- BNI does not have a procedure or responsibilities delineated for **Long Term Lay-up**. In addition, BNI C&T is currently revamping/revising BNI Doc.24590-WTP-GPP-CON-6201 "Equipment, Preservation and Maintenance" procedure; however, this will not address Long Term Lay-up.

- BNI and BNI C&T PROGRAMATIC ISSUE: procedures outlining the implementation and responsibilities for preventative maintenance/lay-up of **system/facilities** do not exist.

  ✓ Currently C&T performs preventative maintenance for direct BNI procured **components** not **systems** or **subcontracted systems**. C&T does not have procedures in place to handle PM's on BNI procured **systems/facilities** or subcontracted systems.
  ✓ C&T does not provide any preventative maintenance for subcontracted components before turnover.
  ✓ BNI relies on the subcontractor to perform there own PM's.

2. **BNI SUBCONTRACT'S**

Subcontract, Surveillance, Acceptance and Closeout for the Cooling Tower (CT), Steam Plant (SP), Field Erected Tanks (FET) and Pumphouses (PH) are in the *acceptance/punchlist phase*. Subcontracted equipment/facilities are turnover to C&T upon BNI issuance of "*Certificate of Final Acceptance*" notice to Subcontractor.

NOTE

- BNI stated that their goal was to accept subcontractor facilities/systems within 60-90 days of substantial completion. However, BNI cited lack of money-$, BNI de-staffing and slow subcontractor submittal responses is the cause as to why subcontracted facilities/systems have not been accepted and turned over to C&T.

  ✓ Prior to component/system turnover BNI must verify/confirm that all work has been completed in accordance with design/construction records and submitted to PDC before "Certificate of Final Acceptance" can be sent to subcontractors.

  ✓ BNI stated that more staff and money was needed to verify that all subcontractor documentation was submitted and all punchlist work was completed.

- ✓ C&T has recently started to participate in the subcontracted facility/equipment punch list/acceptance phase.

NOTE
- Currently BNI relies on the Subcontractor to perform PM's or Lay-up before official turnover to BNI. In addition BNI does not require the Subcontractor to submit weekly/monthly documentation verifying that PM's were completed.

NOTE
- BNI Construction does not track/record all subcontracted components/systems to insure that PM's are completed.

*Subcontract Areas of Concern:*

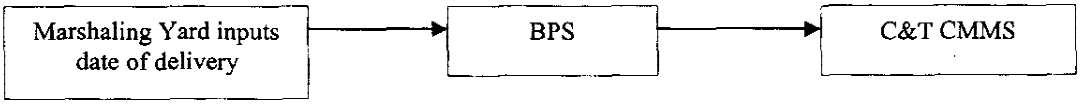
- The CT, SP, FET and PH's are essentially completed *(aside from punchlist items and submittal verification)* but have not been accepted and turned over to C&T. These facilities and equipment have been in the BNI *acceptance phase* for up to a year; solely relying on subcontractors to perform required PM's and/or Lay-ups.

  - ✓ The subcontractors are performing intermittent to nonexistent PM's/Lay-up and BNI does not have a system/database in place to track the required maintenance/lay-up or perform the work themselves if the subcontractor does not. BNI has recently been trying to get the subcontractors to send in documentation showing that they are performing required maintenance.

3. **BNI C&T/CMMS** C & T staff previously showed Carol Babel and Mary Ryan (ORP assessment team) the CMMS database and weekly/monthly PM tracking of all CMMS entered equipment.

- Currently BNI C&T is currently revamping/revising BNI Doc.24590-WTP-GPP-CON-6201 "Equipment Preservation and Maintenance"
- CMMS has direct links to other interfacing databases.

NOTE
- Work orders are generated from the weekly/monthly PM lists and are sent to pertinent department/craft for required maintenance.
- Diagram below showing database control of BNI procured equipment.




**ANSWERS TO QUESTIONS** that were emailed 07FEB06 and discussed during the WTP Site meeting 07FEB06

4. Once BNI procured equipment/materials are entered into a database at the Marshaling Yard, does your group print-out Material Receipt Reports daily to manually enter equipment into CMMS or is this information electronically transferred into CMMS without manual input along with a printout being run showing new equipment received into CMMS? **Answer**: The information that meets the trigger criteria is electronically migrated. There are reports available to identify the new equipment input by the migration.

5. Is the warranty work or repair of defective equipment upon delivery such as, (the gages that were broke upon delivery of the Chillers or the defective welds on the Air Dryers) handled through USO&Ds noted in CMMS? Is Procurement responsible for this? **Answer**: Corrective maintenance is tracked in the CMMS database. However, equipment received with repairs needed is processed by the Marshalling Yard's procedures and programs, which is the USO&D. Procurement is responsible for the USO&D program.

6. Does the documents/information within other databases that are linked to CMMS have a direct link (via function key providing link that automatically brings up the information within other databases) or is information linked through key words and then an operator would need to manually input info into the

other databases to access the link? **Answer**: Documents and procedures that are resident in PDC are linked into the CMMS. These documents/procedures are opened from within CMMS. Other pertinent information concerning a piece of equipment is migrated to fields in CMMS. All other data would have to access by opening the upstream program and database.

7. Is Long-Term Storage of equipment being address in the new Preservation and Maintenance procedure? **Answer**: Long term storage is not currently in the proposed Equipment Preservation and Maintenance revision. The procedure that controls "storage" is Field Materials Management (24590-WTP-GPP-GCB-00 100). CMMS will however have all the short and long term maintenance requirements.

DESIGN OVERSIGHT NOTE

| | |
|---|---|
| Design Oversight Note Number: | **D-05-DESIGN-019 (JEO.1)** |
| Assessors Names(s): | **John E Orchard** |
| Dates of Inspections/Assessments: | **JAN/FEB-2006** |
| Area/Items(s) Reviewed: | **Steam Plant** (BNI Lay-up and Turnover of Balance of Facility Systems) |

**9.0 Overview**: I specifically reviewed the contractor and subcontractor documentation of Balance of Facility (BOF) Steam Plant and conducted interviews with the Contractor management/staff relative to the lay-up, preventative maintenance and turnover/testing of the equipment and systems. The Oversight Review Team as a whole reviewed the procedures and documentation associated with the preventative maintenance, lay-up and turnover of the BOF Steam Plant, Chiller Compressor Plant, Cooling Tower, Field Erected Tanks, Pump Houses, and Underground Piping.

**10.0 Engineering Management Oversight Documents Reviewed**:

24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005
24590-WTP-GPP-CON-3607, Rev 2, *Operation of Systems Under Construction Custody,* dated November 1, 2005
24590-WTP-RPT-CN-01-004, Rev 1, *Construction and Acceptance Testing Program,* dated November 15, 203
24590-WTP-GPP-CON-4103, Rev 0, *Subcontract Surveillance, Acceptance, and Closeout,* dated July 24, 2004
24590-WTP-RPT-CN-01-001, Rev 0, *Construction, Procurement and Acceptance Testing,* dated July 02, 2001
24590-WTP-GPP-CON-7113, Rev 1, *Construction Record Completion*, dated July, 20, 2005
24590-WTP-GPP-CON-1602, Rev 0, *System and Area Completion and Turnover*, dated March 16, 2005
24590-WTP-RPT-CN-01-004, Rev 1, *Construction and Acceptance Testing Program*, dated November 15, 2003
24590-WTP-GPP-CON-4101, Rev 7, *Construction Subcontract Management*, dated June 23, 2005
24590-WTP-GPP-CON-7105, Rev 2, *Subcontractor Submittals*, dated October 13, 2004
24590-WTP-GPP-MGT-0013, Rev 4, Acceptance of Procured Material, dated February 21, 2005
24590-WTP-GPP-GCB-0100, Rev11, Field Materials Management, dated April 15, 2005
24590-WTP-RITS-QAIS-05-1341, *Subcontractor Preventative Maintenance Req Review*, dated DEC 22, 2005
24590-NP-SRA-HX00-00009-02-00008, Rev.00B CHAMPS document, dated 9-15-05.

**C&T Interfacing References**

24590-WTP-GPP-CON-3103 – Field Change Requests (FCR) /Field Change Notices (FCNs).
24590-WTP-GPG-CON-3105 – Temporary Facilities & Utilities.
24590-WTP-GPP-CON-3106 – Construction Deficiency Reporting & Control.
24590-WTP-GPP-CON-3607 – Operation of Systems under Construction Custody.
24590-WTP-GPP-CON-4101 – Construction Subcontract Management.
24590-WTP-GPP-CON-7101 – Construction Quality Control Program.
24590-WTP-GPP-CON-7104 – Nonconformance Reporting & Control.
24590-WTP-GPP-CON-7110 – Material Receiving Inspection.
24590-WTP-GPP-GCB-00100 – Field Materials Management.
24590-WTP-3DP-G03B-0004 – Standard Component Numbering.
24590-WTP-GPP-MGT-0013 – Acceptance of Procured Material.

**O&M Lay-up Document for the Steam Plant**

24590-CM-HC1-MBFO-00001-10-00119 – Temporary Lay Up Submittal for Boiler Room Equipment.
24590-BOF-FD-M-01-001, Rev A – Steam Plant Facility Description.
24590-CM-HC1-MBFO-00001-04-00019 – Steam Plant Floor Plan – as built.
24590-CM-HC1-MBFO-00001-04-00021 – Steam Plant P&ID – as built.

24590-CM-HC1-MBFO-00001-04-00032 – Steam Plant P&ID – as built.
24590-CM-HC1-MBFO-00001-04-00098 – Package Boiler P&ID – as built.
24590-CM-HC1-MBFO-00001-08-00044 – Boilers and Ancillary Equipment Lay Up Maintenance Procedures

**11.0 Adequacy and Effectiveness** of the following as identified within Paragraph 2.0 of the *BOF Equipment, Systems and Facilities Turnover Testing* assessment plan - number D-05-DESIGN-019.

3.0.a Evaluate development of "punch list" plans/procedures/record keeping implemented during construction completion walk-throughs prior to final acceptance of subcontractor work.

- The development of the punch list for turnover from Subcontractor to Bechtel Construction is performed in accordance with 24590-WTP-GPP-CON-4103, Rev 0, *Subcontract Surveillance, Acceptance, and Closeout,* dated July 24, 2004, which I determined had acceptably addresses all issues for Subcontractor Turnover.

3.0.b Evaluate "punch list" resolution and final Contractor acceptance plans/procedures and record keeping activities prior to final acceptance of subcontractor work = see paragraph above.

- The resolution of the punch list for turnover from Subcontractor to Bechtel Construction is performed in accordance with 24590-WTP-GPP-CON-4103, Rev 0, *Subcontract Surveillance, Acceptance, and Closeout,* dated July 24, 2004, which I determined had acceptably addresses all issues for Subcontractor Turnover.

3.0.c Evaluate procedures and programs implementing preventive maintenance activities for BOF equipment/systems and facilities in short and long-term storage/lay-up.

- I reviewed the Bechtel procedures on conducting the equipment/system/facility lay-up procedures, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005, which I determined had adequately addressed all the pertinent issues.

3.0.d Evaluate the training and qualification of personnel implementing the short or long-term storage programs and procedures prior to Contractor turnover to DOE-ORP.

- I reviewed the Bechtel procedures on Training, including, 24590-WTP-GPP-CTRG-002, Rev 9, *Training*, dated August 8, 2005, which I determined had adequately addressed all the pertinent issues.

3.0.e Evaluate the record keeping procedures/plans demonstrating management of BOF equipment/systems and facilities during short/long term lay-up and turnover activities.

- I reviewed the Bechtel procedures on record keeping for the lay-up program, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005, which I determined had adequately addressed all the pertinent issues.

3.0.f Evaluate the record keeping procedures/plans demonstrating management of documents such as O&M documents regarding BOF equipment/systems/facilities during short/long term lay-up and turnover activities.

- I reviewed the Bechtel procedures on record keeping for the lay-up program, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005, which I determined had adequately addressed all the pertinent issues.

**12.0 Observations and Assessments**:

The Bechtel Lay-up and Turnover programs are two separate programs. There are two turnovers involved here: turnover from a Subcontractor to Construction, and turnover from Construction to Startup/Commissioning. Startup

roughly refers to construction acceptance testing (ATP), and Commissioning roughly refers to operations acceptance testing (OTP) plus warrantee run. Commissioning also includes equipment/system/facility preservation and maintenance after taking custody. However, because of the recent schedule extension, the Commissioning scope is currently being expanded to include preservation and maintenance of any equipment/system/facility specifically identified by Construction as needing same on delegation from Construction. Also because of the recent schedule extension, the Subcontractor scopes are being expanded to include developing Lay-up procedures and in some cases initiating and even implementing those procedures. Bechtel is currently developing a new plan to better enumerate and integrate these Lay-up, and preservation and maintenance activities by Engineering (who specifies and reviews the Subcontractor procedures), Subcontractors, Construction, and Commissioning.

I reviewed the Bechtel procedures on Subcontractor Turnover, including 24590-WTP-GPP-CON-4103, Rev 0, *Subcontract Surveillance, Acceptance, and Closeout,* dated July 24, 2004, which I determined had acceptably addresses all issues for Subcontractor Turnover. I reviewed the Bechtel procedures on Construction Turnover, including 24590-WTP-GPP-CON-1602, Rev 0, *System and Area Completion and Turnover*, dated March 16, 2005, which I determined had acceptably addresses all issues for Construction Turnover. I reviewed the Bechtel procedures on conducting the equipment/system/facility lay-up procedures, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005, which I determined had adequately addressed all the pertinent issues. I reviewed the Steam Plant Subcontractor Lay-up Procedure, 24590-CM-HC1-MBFO-00001-10-00119, Rev 00A, *Temporary Lay Up Submittal for Boiler Room Equipment*, dated June 16, 2005, which I determined adequately addressed the lay-up of the pertinent equipment in the Steam Plant, as evidenced by the Bechtel review approvals. Therefore, I concluded that the Lay-up procedures are generally appropriate, the program for conducting the lay-ups is reasonably adequate and being improved to reflect the changing circumstances, and the Turnover programs are conventional and acceptable.

**13.0 Miscellaneous Notes: None.**

**14.0 Conclusion:** The Lay-up procedures are generally appropriate, the program for conducting the lay-ups is reasonably adequate and being improved to reflect the changing circumstances, and the Turnover programs are conventional and acceptable.

**Submitted By:**_____ **Approved By:**_____

**Date:** **Date:**

**Personnel Interviewed:**

BNI:
W. Clements
J. Wright
T. Dallas
B. Lynch
T. Burks

## DESIGN OVERSIGHT NOTE

**Design Oversight Note Number: D-05-DESIGN-019-CAB-01**

**Assessors Names(s) Carol Babel Dates of Inspection: Nov. 28-Jan. 31, 2005**

**Area/Items(s) Reviewed: BNI Lay-up and Turnover of Balance of Facility Systems**

The Design Oversight reviewed the Contractor documentation of Balance of Facility (BOF) Underground Piping and Utilities and conducted interviews with Contractor management and staff relative to the lay-up, preventative maintenance, and turnover of the system.

**Observations and Assessments**

Engineering Management Oversight

Documents Reviewed:

- 24590-WTP-GPP-CON-7101, Rev 7, *Construction Quality Control Program"*, dated October 27, 2005
- 24590-WTP-GPP-CON-3607, Rev 2, *Operation of Systems Under Construction Custody*, dated October 27, 2005
- 24590-WTP-GPP-CON-7113, Rev. 1, *Construction Record Completion*, dated July, 20, 2005
- 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005
- Memo from J. W. Wilson to M.N. Brosee, dated May 12, 2005, CCN 100398, Division of Responsibility-Construction Department and Commissioning and Training Department for Preservation Maintenance
- 24590-WTP-GPP-GCB-00100_11, *Field Materials Management*, dated April 15, 2005
- 24590-WTP-GPP-CON-1602, Rev. 0, *System and Area Completion and Turnover*, dated March 16, 2005
- 24590-WTP-GPP-CON-3105, Rev 4, *"Construction Procedure: Special Instructions"*, dated January 6, 2005
- 24590-WTP-GPP-CMNT-002, Rev. 0, *Conduct of Maintenance*, dated December 6, 2004
- 24590-WTP-GPP-CON-3502, Rev 1, *Underground Piping Installation*, dated October 20, 2004
- 24590-WTP-RPT-CN-01-004, Rev. 1, *Construction and Acceptance Testing Program*, dated November 15, 2003
- 24590-WTP-PL-OP-01-004, Rev C-1, *WTP Maintenance Implementation Plan*, dated December 14, 2001
- 24590-WTP-GPP-CON-3506, Rev 0, *Purge Drying, De-Purging, & Lay-up of Piping Systems & Components*, dated June 9, 2003
- 24590-WTP-RPT-OP-01-001, Rev 2, *Operations Requirements Document"*, dated May 5, 2003.
- 24590-WTP-3PS-PS02-T0003, Rev 4, *"Engineering Specification for Field Fabrication and Installation of Piping"*, dated April 4, 2005
- 24590-WTP-3PS-NW00-T0002, Rev 1, *"Engineering Specification for Chemical Requirements for Materials Used in Contact With Austenitic Stainless Steel and Nickel Based Alloys"*, dated March 8, 2005
- 24590-WTP-3PS-P000-T0001, Rev 5, *Engineering Specification for Piping Material Classes General Description and Summary"*, dated February 23, 2005
- 24590-BOF-3PS-PX12-T0006, Rev 0, *Engineering Specification for Underground Anhydrous Ammonia Reagent Piping System*, dated October 27, 2004
- 24590-BOF-3PS-CY01-T0001, Rev 1, *Engineering Specification for Installation of Cooling Water, Chilled Water Ductile Iron Pipelines*, dated April 21, 2004
- 24590-BOF-3PS-PX12-T0003, Rev 0, *Engineering Specification for Demineralized Water Piping Installation*, dated July 9, 2003
- 24590-BOF-3PS-PX12-T0005, Rev 0, *Engineering Specification for Process Service Water Piping Installation*, dated July 8, 2003
- 24590-BOF-3PS-PZ41-T0005, Rev 0, *Engineering Specification for Underground Raw Water System Piping Installation*, dated June 16, 2003
- 24590-BOF-3PS-PX12-T0001, Rev 4, *Engineering Specification for PVC Potable Water Piping Installation*, dated June 11, 2003

- 24590-BOF-3PS-PX-12-T0004, Rev 0, *Engineering Specification for Underground Diesel Fuel Oil Piping Installation,* dated June 11, 2003
- 24590-BOF-3PS-PX12-T0002, Rev 0, *Engineering Specification for Installation of PVC Non-Radioactive Liquid Waste Disposal (NLD) System Piping,* dated May 16, 2003
- 24590-BOF-3PS-PZ41-T0001, Rev 3, *Engineering Specification for Underground Fire Protection Piping Mains,* dated October 14 2002
- 24590-BOF-3PS-P000-T0001, Rev 3, *Engineering Specification for Technical Specification for Installation of Underground Compressed Air Piping,* dated October 3, 2002

Document Review and Evaluation: The following discussion presents the procedures and documentation reviewed for this assessment associated with the preventative maintenance, lay-up, and turnover of the underground piping systems.

Contract DE-AC27-01RV1436, dated December 11, 2000, between the U.S. Department of Energy (DOE) and Bechtel National, Inc. (BNI), Section I provides a list of required Federal Acquisition Requirements (FAR). Clause 1.88, FAR, 52.245-5 section (c) *Property administration,* subsection (2) states "The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound business proactive and applicable provisions of FAR Subpart 45.5".

24590-WTP-PL-OP-01-004, Rev C-1, *WTP Maintenance Implementation Plan,* dated December 14, 2001. This document is designed to meet the requirements of 24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II,* section 7.6, Maintenance. This plan is based on DOE Guide 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1-1".*

24590-WTP-RPT-CN-01-004, Rev. 1, *Construction and Acceptance Testing Program*, dated November 15, 2003. This document is a Prime Contract Deliverable that implements the requirements of the Prime Contract, Standard 4, (f)(1), Construction, Procurement, and Acceptance Testing. This program describes the basic program elements relating to construction inspection and construction acceptance testing.

The *Operations Requirements Document* (24590-WTP-RPT-OP-01-001, Rev 2) is used as the operations and maintenance (O&M) basis for designing the WTP, and planning its subsequent O&M documents (such as procedures, staffing, training). The maintenance program establishes the requirements for maintaining equipment and systems. The maintenance organization is responsible for the material condition of the WTP and its facilities. The equipment and system maintenance program will identify the frequency of routine maintenance operations that will continue upon transition from the construction organization. These programs will identify preventive maintenance and steps to be taken for equipment failure. These programs are particularly important during the early stages of the commissioning program, when equipment and systems may stand idle for long periods. The work control system will provide management with an accurate status of maintenance planning and outstanding maintenance activities. A priority system will control activities or work to manage backlog. The work control system will use the Computerized Maintenance Management System (CMMS) or Operational Data Management (ODMS) for this purpose. O&M specific vendor data is required to support operations, maintenance, testing, and training programs. O&M specific vendor data will be specified in the engineering procedures and implemented in the procurement process.

24590-WTP-GPP-CON-7101, Rev 7, *Construction Quality Control Program",* dated October 27, 2005. This procedure describes the Construction Quality Control Program, which establishes the methods used by Construction to plan, perform, and document inspections, tests, and reviews to ensure compliance with Engineering drawings and specifications. This procedure implements the *Quality Assurance Manual* (24590-WTP-QAM-QA-01-001) requirements applicable to Construction activities for the WTP project.

24590-WTP-GPP-GCB-00100_11, *Field Materials Management,* dated April 15, 2005. This procedure defines the development and implementation of the field material management process for the WTP. The objective is to provide clear direction for receipt, storage, issue and control of material and equipment. Appropriate storage is to be maintained until transition to start up. Material equipment and components are to be stored in accordance with purchase order requirements; manufacturer's specifications, MAAP requirements or direction from field engineering or C&T Maintenance to ensure all are properly controlled and protected. In storage maintenance activities are

performed and documented in accordance with, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005. This procedure is applicable to the preservation of temporary and permanent plant items identified as requiring maintenance. The preservation and maintenance scope starts at material receipt, continues through construction, and terminates at equipment transition to Start up. The equipment's maintenance or storage requirements are identified using operation and maintenance manuals, code requirements, or equivalent information, and then the necessary information is input into TeamWorks and/or CMMS. Per, 24590-WTP-GPP-CON-7113, Rev. 1, *Construction Record Completion*, dated July, 20, 2005, as construction records are generated, each record is added to the Construction Record Log in TEAMWorks or Setroute, and linked to a structure, system, or component via a Parent Identification Number. Prior to turnover, the tables containing the Parent IDs in TEAMWorks and Setrout are updated to include the applicable turnover number (system, area, and commodity) for each Parent ID on those lists. The Responsible Field Engineer (RFE) ensures that all records for each turnover have been identified, completed and submitted to PDC. As systems, areas and commodities are turned over in accordance with 24590-WTP-GPP-CON-1602, Rev. 0, *System and Area Completion and Turnover*, dated March 16, 2005, the RFE ensures that Exception List Items include associated record numbers, which will document completion of that item. At the time of turnover to C&T, the RPE ensures that all construction records have been submitted to PDC for the applicable system, area or commodity. The Project StartUp Manager (PSUM) is responsible for the identification of system boundaries, providing system turnover logic, identifying project test scope, including a division of responsibilities (DOR), developing a Schedule to be integrated into the Project Schedule and thereby defining the required Turnover Schedule, and supporting the approved project turnover processes. Construction completion is defined as; the stage reached during the assembly of the system or area when the construction phase has been substantially completed and the system or area is ready for a joint Construction and Startup, Area Receiving Organization and/or Client walkdown.

The construction of WTP underground piping and utilities is currently an ongoing BNI Contractor activity that has not reached the "construction complete" stage or the "turnover" phase yet. However, the backbone of the complete process discussed above is being worked and at this stage construction work and documents are recorded in TEAMWorks and SetRoute. The requirements and responsibilities for the installation of underground piping are defined in the procedure, 24590-WTP-GPP-CON-3502, Rev 1, *Underground Piping Installation,* dated October 20, 2004. Underground pipe is installed in accordance with 24590-WTP-3PS-PS02-T0003, Rev 4, "*Engineering Specification for Field Fabrication and Installation of Piping*", dated April 4, 2005. The Field Engineer (FE), Responsible Superintendent (RD), and Quality Control Engineer (QCE) perform in process monitoring and inspection of the quality of the installation process to ensure that the installation is in accordance with the latest drawings and specifications (see list of engineering specifications in the references list).

The preservation and maintenance activities for underground piping include pressure testing, cleaning the pipe, coating and wrapping the pipe, purge drying and lay-up. Pressure testing is performed in accordance with the jobsite pressure testing procedure, 24590-WTP-GPP-CON-3504. When testing has been completed and accepted, the pipe is cleaned and dewatered per engineering specifications, coated and wrapped per the manufacturer's recommendations. Carbon steel lines are drained to remove standing water. Water used for hydrotesting and flushing of stainless steel lines need to meet the requirements of 24590-WTP-3PS-NW00-T0002, Rev 1, "*Engineering Specification for Chemical Requirements for Materials Used in Contact With Austenitic Stainless Steel and Nickel Based Alloys*", dated March 8, 2005. To minimize the potential of microbiologically induced corrosion only treated process water, potable water, or deionized water is used for cleaning, flushing and hydrotesting. Further, water is not left standing in the pipe or component for more than 72 hours unless treated with a biocide. After hydrotesting, the system is put in a wet lay-up condition, or drained and blown dry with clean, oil free compressed air or nitrogen in accordance with the specification for the installed type of pipe.. 24590-WTP-GPP-CON-3506, Rev 0, *Purge Drying, De-Purging, & Lay-up of Piping Systems & Components,* dated June 9, 2003 provides the methodology for the purge drying, de-purging, and lay-up processes utilizing compressed gases in piping systems and associated components during the construction phase of the WTP. The RFE is responsible for identifying piping and system components that are required to be maintained using the purge drying or lay-up processes and for maintaining the record log for each process. The log gives a complete description of the activity, and the monitoring requirements (i.e. boundaries, purge gas flow rates, holding pressures, monitoring frequency, maximum humidity allowances, etc.). All underground piping is installed and tested in accordance with the engineering specification written for each system piping installation (chilled water, compressed air, raw water, demineralized water, process service water, potable water, diesel fuel oil, non-radioactive liquid waste disposal, anhydrous ammonia reagent).

Each piping specification includes the fabrication, installation, and testing of the piping in that particular system. Along the lines of preventative maintenance, although not defined as such are requirements such as: provide temporary closures at building tie-ins, provide insulation material as specified, install jumpers for cathodic protection where required, clean and pressure test the installed pipe system for leakage. The engineering specification specifies the required piping materials, coatings, insulation material, cathodic protection, pressure testing process, and upon completion of installation the requirements for how the piping is to be left while waiting turnover of the system to commissioning. For example, per engineering specification underground chilled water pipelines are cement lined, ductile iron pipe, with insulation, heat tracing and cathodic protection installed as shown on P&ID-BOF-Chilled Water Systems Yard Distribution Piping, 24590-BBOF-M6-CHW-00001. Upon completion of underground installation, each chilled water pipeline is kept in a flooded state.

Field Interviews: The following discussion presents the information obtained from interviews with BNI personnel on January 10, 2006 on the underground piping systems and the system utilities.

None of the underground piping or utilities is in the turnover phase of work yet. Other than the requirements given in engineering specifications for piping material to install, insulation and heat tape needed, cathodic protection requirements, which leak test process to use, what configuration to leave the piping in after leak testing has been performed there are no further maintenance requirements for the underground piping.

Jeff Bieber demonstrated the TeamWorks database where all records and information for receipt, installation, weld records, pipe inspection reports, cad well record reports, pressure test records, etc. for the underground piping is stored, prior to the turnover process, when the data will be transferred to the CMMS computer database on a package by package basis. A section of Chilled Water line in planning area B was selected at random to follow through the TeamWorks database to observe how data was entered and what data is present. Jeff demonstrated how that section of pipe was input into TeamWorks using a Parent Identification Number (PIN) to identify each work package. Then as reports, inspections, tests, etc. are completed they are tied into TeamWorks by the PIN, so that any work package can be brought up on the screen to see the status of work done and a list of reports and records that have been generated for that work package. Once the turnover process begins the whole system will be broken down into turnover packages and the TeamWorks database will be used to populate the CMMS database. For Chilled Water lines a hydro pressure test is performed and since these pipes are lined with concrete the water to perform the pressure test is left in the pipe as a preservation measure per the engineering specification for the chilled water pipeline. If any piping inspections show a nonconformance to the engineering specifications then a construction deficiency report (CDR) is written. An example CDR was provided (24590-WTP-CDR-CON-06-0004) for an incident where an air compressor/desiccant dryer that was outside specs (virtually free of oil aerosols instead of the required oil free type) was used by construction on a section of piping that feeds the permanent service air system.

Dennis Spores discussed the same process with us for the electrical utilities (conduit, cable and trays). It is similar to the underground piping except for electrical utilities, SetRoute cards are used, and the SetRoute numbers are tied together into work packages (identified with PIN) that are then tied to TeamWorks.

It appears BNI has an adequate system and database for tracking the construction work that has been done on the underground piping and utilities and for documenting any deficiencies discovered in the installation and temporary use of installed piping and utilities. As far as lay-up and turnover activities are concerned the project is not yet in that stage of work, and so this could not be assessed.

**Conclusion:**

The Design Oversight concluded the BNI preventative maintenance, lay-up and turnover of the underground piping and utilities is on track but has not yet reached the point in the process to implement the existing approved lay-up and turnover procedures. The computer databases and procedures being utilized by BNI in the pre-turnover construction phase of the project are acceptable and should lend to a successful turnover to C&T. The portion of the program that appears to be lacking is a clear definition of when construction is complete and turnover will occur. In addition, it is not clear how installed piping and utility materials will be preserved since there will be a relatively

long time between installation of the material and turnover to C&T. Procedures for preservation of the DOE owned assets during this interim stage of time do not seem to exist.

Open item: Procedures and implementation of procedures for preservation of DOE owned assets (underground piping and utilities) during the interim period of installation and turnover to C&T.

**Submitted By:** Carol Babel
**Date:** 01/11/06

**Personnel Interviewed:**

BNI:
J. Bieber
D. Spores

ORP:
J. Bruggeman

ORP Assessment Team Members:
M. Ryan
J. Orchard
J. Adams

**DESIGN OVERSIGHT NOTE**

**Design Oversight Note Number: D-05-DESIGN-019-CAB-02**

**Assessors Names(s) Carol Babel Dates of Inspection: Nov. 28 – Feb. 17, 2005**

**Area/Items(s) Reviewed: BNI Lay-up and Turnover of Balance of Facility Systems**

The Design Oversight reviewed the Contractor documentation of Balance of Facility (BOF) Pump Houses and Field Erected Tanks (FETs) and conducted interviews with Contractor management and staff relative to the lay-up, preventative maintenance, and turnover of these BOF components.

**Observations and Assessments**

Engineering Management Oversight

Documents Reviewed:

- 24590-WTP-GPP-CON-7101, Rev 7, *Construction Quality Control Program"*, dated October 27, 2005
- CCN 100398, Memo from J. W. Wilson to M.N. Brosee, *Division of Responsibility-Construction Department and Commissioning and Training Department for Preservation Maintenance*, dated May 12, 2005
- 24590-WTP-GPP-CON-1602, Rev. 0, *System and Area Completion and Turnover*, dated March 16, 2005
- 24590-WTP-GPP-CMNT-002, Rev. 0, *Conduct of Maintenance,* dated December 6, 2004
- 24590-WTP-RPT-CN-01-004, Rev. 1, *Construction and Acceptance Testing Program*, dated November 15, 2003
- 24590-WTP-PL-OP-01-004, Rev C-1, *WTP Maintenance Implementation Plan,* dated December 14, 2001
- 24590-WTP-RPT-OP-01-001, Rev 2, *Operations Requirements Document"*, dated May 5, 2003.
- 24590-WTP-GPP-CON-7110, Rev 4, Construction Procedure: *Material Receiving Instructions,* dated July 28, 2005.
- 24590-WTP-GPP-CON-4101, Rev 8, Construction Procedure: *Construction Subcontract Management,* dated January 11, 2006.
- 24590-WTP-GPP-GCB-00100, Rev 11, Procedure: *Field Materials Management,* dated April 13, 2005.
- 24590-WTP-GPP-CON-6201, Rev 4, Procedure: *Equipment Preservation and Maintenance,* dated June 30, 2005.
- 24590-WTP-GPP-CON-7113, Rev 1, Construction Procedure, *Construction Record Completion,* dated July 28, 2005.
- 24590-WTP-GPP-CON-7107, Rev 7, Construction Procedure: *Field Project Document Control,* dated June 9, 2005.
- 24590-WTP-GPP-CON-1601, Rev 0, Construction Procedure: *Control of Punchlist Items,* dated December 14, 2005.
- 24590-WTP-3DP-G04B-00058, Rev 4, Engineering Department Project Instructions: *Supplier Engineering and Quality Verification Documents,* dated August 1, 2005.
- 24590-WTP-3DP-G06B-00002, Rev 5, Engineering Department Project Instructions: *Subcontracts,* dated August 1, 2005.
- 24590-WTP-3DP-G06B-00010, Rev 3, Engineering Department Project Instructions: *Specifying Supplier Quality Assurance Program Requirements,* dated December 15, 2005.
- 24590-WTP-CON-7105, Rev 2, Construction Procedure: *Subcontractor Submittals,* dated October 14, 2004.
- 24590-WTP-GPP-PADC-010, Rev 1, Construction Procedure: *Supplier and Subcontractor Submitted Document Control,* dated September 12, 2005.
- 24590-WTP-GPP-CO-4103, Rev 0, Construction Procedure: *Subcontract Surveillance, Acceptance, and Closeout,* dated July 29, 2004.
- 24590-WTP-GPP-CON-3103, Rev 9, Construction Procedure: *Field Change Request (FCRs)/Field Change Notices (FCNs),* dated November 23, 2005.

- 24590-WTP-GPP-CON-3106, Rev 5, Construction Procedure: *Construction Deficiency Reporting & Control,* dated December 29, 2004.
- 24590-BOF-3PI-G000-00003, Rev 0, Design Input Memorandum, *Performance Specification for BOF Pumphouse Facilities,* dated December 9, 2002.
- 24590-CM-HC1-MPGP-00001-38-00002 Rev 00A, *Operations and Installation Manual – NLD Pumphouse Facility,* by Resource Technology Group, Inc., received by WTP Field Subcontracts March 01, 2005.
- 24590-CM-HC1-MPGP-00001-13-00015, Rev 00A, *Instrument List,* by Resource Technology Group, Inc., received by WTP Field Subcontracts April 18, 2005.
- 24590-CM-HC1-MPGP-00001-38-00009, Rev 00A, *Long Term Storage Maintenance Log,* received by PDC August 4, 2005.
- 24590-CM-HC1-MPGP-00001-31-02, Rev 00B, *DFO Pump Installation and O&M Manual (Pumps DFO-PMP-00001A/B and DFO-PMP-00003),* received by WTP Field Subcontracts February 12, 2004.
- 24590-CM-HC1-MPGP-00001-14-01, Rev 00A, *BOF Pump House Facilities Quality Assurance Project Plan,* received by PDC April 18, 2003.
- 24590-WTP-RITS-QAIS-05-1341, *Subcontract Preventative Maintenance Requirements Review,* entry date December 22, 2005.
- A-05-AMWTP-RPPWTP-002-65, *Field Representative's Inspection Notes,* dated May 18, 2005.
- A-05-AMWTP-RPPWTP-004-34, *Field Representative's Inspection Notes,* dated November 7, 2005.
- 24590-BOF-3PS-G000-T0003, Rev 1, *Engineering Specification for BOF Pump House Facilities,* dated December 8, 2003.
- 24590-WTP-3PI-MTF5-T0001, Rev 0, *Engineering Specification for Field-Erected Tanks Design and Fabrication,* dated December 5, 2002.
- 24590-BOF-FD-M-01-007, Rev A, *Fire Pump House Facility Description,* dated November 11, 2001.
- 24590-BOF-FD-M-01-005, Rev A, *Fuel Oil Pumphouse Facility Description,* dated November 12, 2001.
- FD-W375BF-G00013, Rev A, *Non-Radioactive, Non-Dangerous Liquid Effluent Pumphouse Facility Description,* dated February 4, 2000.
- 24590-BOF-3YD-FSW-00001, Rev 0, *System Description for the Fire Service Water Storage & Distribution System,* dated May 17, 2002.
- 24590-BOF-3YD-NLD-00001, Rev 0, *System Description for the Non-Radioactive Liquid Waste Disposal System,* dated April 2, 2003.
- 24590-BOF-3YD-DFO-00001, Rev A, *System Description for the Diesel Fuel Oil System,* dated June 30, 2002.

References used for field walk down

- 24590-BOF-MT-FSW-00001, Rev 1, *Equipment Assembly Fire Water Storage Tanks FSW-TK-00001 & FSW-TK-00002,* dated June 1, 2003.
- 24590-BOF-M6-FSW-00004, Rev 1, *P&ID Fire Water Storage Tanks System FSW,* dated October 21, 2003.
- 24590-BOF-M6-DFO-00001, Rev1, *P&ID – BOF Fuel Oil System Unloading Storage and Boiler Feed,* dated July 14, 2004.
- 24590-BOF-M6-DFO-00002, Rev 1, *P&ID – BOF Fuel Oil System ITS Emergency Diesel Gen Fuel Oil Storage Vessels,* dated July 14, 2004.
- 24590-BOF-MT-DFO-00001, Rev 1, *Equipment Assembly Fuel Oil Storage Tank DFO-TK-00001,* dated June 1, 2003.
- 24590-BOF-M5-DFO-00001, Rev 0, *Process Flow Diagram Fuel Oil Storage and Transfer System,* dated April 13, 2003.
- 24590-BOF-A1-84-00001, Rev 0, *BOF Fire Water Pump House Facilities Floor Plans & Door Schedule Procurement Drawing,* dated June 11, 2002.
- 24590-CM-HC1-MPGP-00001-15-03, Rev 00D, *BOF Pump House Facilities General Arrangement Fire Water System Pump Houses,* dated May 17, 2004.
- 24590-BOF-M6-FSW -00004, Rev 1, *Fire Water Storage Tanks System FSW,* dated October 21, 2003.
- 24590- CM-HC1-MPGP-00001-15-36, Rev 00D, *BOF Pump House Facilities Fire Pump House – Bldg 84A Architectural Plan Elevations,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-10, Rev 00E, *BOF Pump House Facilities Process and Instrumentation Diagram Fire Water Pump House Bldg. 84A Sheet 1 of 2,* dated August 2, 2005.

- 24590- CM-HC1-MPGP-00001-15-11, Rev 00E, *BOF Pump House Facilities Process and Instrumentation Diagram Fire Water Pump House Bldg. 84B Sheet 2 of 2,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-37, Rev 00D, *BOF Pump House Facilities Fire Water Pump House Bldg. 84B piping Layout,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-48, Rev 00C, *BOF Pump House Facilities Fire Water Pump House Bldg. 84B Architectural Plan and Elevations,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-35, Rev 00D, *BOF Pump House Facilities Architectural Plan and Elevations Fuel Oil Pump House,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-34, Rev 00D, *BOF Pump House Facilities Architectural Plan and Elevations NLD Pump House,,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-01, Rev 00D, *BOF Pump House Facilities General Arrangement NLD Pump House,,* dated August 2, 2005.
- 24590- CM-HC1-MPGP-00001-15-04, Rev 00D, *BOF Pump House Facilities Process and Instrumentation Diagram NLD Pump House Bldg. 84B Sheet 1 of 2,* dated May 17, 2004.
- 24590- CM-HC1-MPGP-00001-15-05, Rev 00D, *BOF Pump House Facilities Process and Instrumentation Diagram NLD Pump House Bldg. 84B Sheet 2 of 2,* dated May 17, 2004.

Document Review and Evaluation: The following discussion presents the procedures and documentation reviewed for this assessment associated with the preventative maintenance, lay-up, and turnover of the Subcontractor design, build and equipment installation of the Field Erected Tanks (DFO, FSW, NLD, PSW, DOM, DIM) and Pump Houses (diesel, fire water, non-radioactive liquid effluent).

Contract DE-AC27-01RV1436, dated December 11, 2000, between the U.S. Department of Energy (DOE) and Bechtel National, Inc. (BNI), Section I, provides a list of required Federal Acquisition Requirements (FAR). Clause 1.88, FAR, 52.245-5 section (c) *Property administration,* subsection (2) states "The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound business proactive and applicable provisions of FAR Subpart 45.5".

24590-WTP-PL-OP-01-004, Rev C-1, *WTP Maintenance Implementation Plan,* dated December 14, 2001. This document is designed to meet the requirements of 24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Volume II,* section 7.6, Maintenance. This plan is based on DOE Guide 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1-1".*

24590-WTP-RPT-CN-01-004, Rev. 1, *Construction and Acceptance Testing Program,* dated November 15, 2003. This document is a Prime Contract Deliverable that implements the requirements of the Prime Contract, Standard 4, (f)(1), Construction, Procurement, and Acceptance Testing. This program describes the basic program elements relating to construction inspection and construction acceptance testing.

The *Operations Requirements Document* (24590-WTP-RPT-OP-01-001, Rev 2) is used as the operations and maintenance (O&M) basis for designing the WTP, and planning its subsequent O&M documents (such as procedures, staffing, training). The maintenance program establishes the requirements for maintaining equipment and systems. The maintenance organization is responsible for the material condition of the WTP and its facilities. The equipment and system maintenance program will identify the frequency of routine maintenance operations that will continue upon transition from the construction organization. These programs will identify preventive maintenance and steps to be taken for equipment failure. These programs are particularly important during the early stages of the commissioning program, when equipment and systems may stand idle for long periods. The work control system will provide management with an accurate status of maintenance planning and outstanding maintenance activities. A priority system will control activities or work to manage backlog. The work control system will use the Computerized Maintenance Management System (CMMS) or Operational Data Management (ODMS) for this purpose. O&M specific vendor data is required to support operations, maintenance, testing, and training programs. O&M specific vendor data will be specified in the engineering procedures and implemented in the procurement process.

24590-WTP-GPP-CON-7101, Rev 7, *Construction Quality Control Program",* dated October 27, 2005. This procedure describes the Construction Quality Control Program, which establishes the methods used by Construction

to plan, perform, and document inspections, tests, and reviews to ensure compliance with Engineering drawings and specifications. This procedure implements the *Quality Assurance Manual* (24590-WTP-QAM-QA-01-001) requirements applicable to Construction activities for the WTP project.

24590-WTP-GPP-GCB-00100-11, *Field Materials Management,* dated April 15, 2005. This procedure defines the development and implementation of the field material management process for the WTP. The objective is to provide clear direction for receipt, storage, issue and control of material and equipment. Appropriate storage is to be maintained until transition to start up. Material equipment and components are to be stored in accordance with purchase order requirements; manufacturer's specifications, MAAP requirements or direction from field engineering or C&T Maintenance to ensure all are properly controlled and protected. In storage maintenance activities are performed and documented in accordance with, 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005. This procedure is applicable to the preservation of temporary and permanent plant items identified as requiring maintenance. The preservation and maintenance scope starts at material receipt, continues through construction, and terminates at equipment transition to Start up. The equipment's maintenance or storage requirements are identified using operation and maintenance manuals, code requirements, or equivalent information, and then the necessary information is input into TeamWorks and/or CMMS. Per, 24590-WTP-GPP-CON-7113, Rev. 1, *Construction Record Completion*, dated July, 20, 2005, as construction records are generated, each record is added to the Construction Record Log in TEAMWorks or Setroute, and linked to a structure, system, or component via a Parent Identification Number. Prior to turnover, the tables containing the Parent IDs in TEAMWorks and Setroute are updated to include the applicable turnover number (system, area, and commodity) for each Parent ID on those lists. The Responsible Field Engineer (RFE) ensures that all records for each turnover have been identified, completed and submitted to PDC. As systems, areas and commodities are turned over in accordance with 24590-WTP-GPP-CON-1602, Rev. 0, *System and Area Completion and Turnover*, dated March 16, 2005, the RFE ensures that Exception List Items include associated record numbers, which will document completion of that item. At the time of turnover to C&T, the RPE ensures that all construction records have been submitted to PDC for the applicable system, area or commodity. The Project Startup Manager (PSUM) is responsible for the identification of system boundaries, providing system turnover logic, identifying project test scope, including a division of responsibilities (DOR), developing a Schedule to be integrated into the Project Schedule and thereby defining the required Turnover Schedule, and supporting the approved project turnover processes. Construction completion is defined as; the stage reached during the assembly of the system or area when the construction phase has been substantially completed and the system or area is ready for a joint Construction and Startup, Area Receiving Organization and/or Client walk down.

24590-WTP-GPP-CON-4101, Rev 8, Construction Procedure: *Construction Subcontract Management,* dated January 11, 2006 describes the requirements, responsibilities, and administrative controls for achieving consistent management of all WTP construction subcontracts. After a subcontract construction award has been made the subcontract package is transferred from the Subcontract Multi Facility Acquisition Team to the Field Subcontracts group for administration. A field subcontract filing system and index is set up for each subcontract and is maintained from the time of transfer from the Acquisition Services group at award, through subcontract close-out and final disposition of the documents. This filling system is hard copy filing system, electronic filing system, or both. All official working subcontract files are maintained within production document control (PDC). All subcontractor submittals are reviewed, status noted, and returned to the subcontractor via PDC by BNI in accordance with this procedure and procedures 24590-WTP-GPP-CON-7105, *Subcontract Submittals,* and 24590-WTP-3DP-G04B-00058, *Supplier Engineering and Quality Verification Documents.* PDC utilizes an electronic document management system (EDMS) to log the appropriate submittal data during submittal receipt and return actions. The Lead Subcontract Coordinator and the Field Engineering Manager develop Parent ID numbering schemes for each subcontractor records. Submittal status reports are available from PDC and the EDMS to track submittal status for each subcontract. Changes to a subcontract are to be handled in accordance with procedures 24590-WTP-GPP-CON-3103, *Field Change Requests (FCRs)/Field Change Notices (FCNs)* and 24590-WTP-3DP-G04B-0062, *Disposition of Field Change Requests/Field Change Notices.* The BNI Subcontract Administrator (SA) is to maintain status of subcontract progress through daily subcontract reports (DSRs), progress reviews, schedule updates, and coordination meetings between BNI and the subcontractor. All identified subcontractor work deficiencies are to be written in accordance with the Non Compliance Report (NCR) or Construction Deficiency Report (CDR) procedures. The construction procedure 24590-WTP-GPP-CON-4103, Rev 0, *Subcontract Surveillance, Acceptance, and Closeout*, covers the surveillance and acceptance of actual subcontract work as opposed to subcontract documents and steps required to close out a subcontract. As physical work on the

subcontract nears completion the Subcontractor Coordinator develops a punchlist document in accordance with the construction procedure, 24590-WTP-CON-1601, Rev 0, *Control of Punchlist Items,* with participation of the Subcontractor. Punchlist items may be added to PunchWorks database for tracking during construction prior to system and area completion and turnover if approved by the Field Engineering Manager. The punchlist incorporates all outstanding work not completed and work needing correction including maintenance requirements. The Final Acceptance of subcontract Closeout is based on the Subcontract Coordinators verification that the work and required documentation is complete. This is pre-requisite to issuance of the Certificate of Final Acceptance.

CCN 100398, Memorandum J.W. Wilson, BNI to M.N. Brosee, BNI, *Division of Responsibility – Construction Department and Commissioning and Training Department for Preservation Maintenance,* dated May 12, 2005. This memorandum outlines the responsibilities for the parties concerning administration of the preservation maintenance program.

Within the Facility Description and System Description documents maintenance requirements are given, basically the pump houses and building service systems are to be designed to rely on "direct-hands-on maintenance" using conventional equipment. Location of equipment in the pump houses is to be determined with proper consideration to repair, maintenance, inspection, and permit monitoring. Equipment should be able to be isolated for maintenance without requiring an outage of the entire associated system. The openings and doors are to be large enough to allow removal of a pump and motor or other component from the facility. A preventative maintenance plan for equipment associated with each of the pump houses is to be developed. The Fire Service Water (FSW) system description specifies the FSW are maintained and periodically tested in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.*

A single contract was awarded to RTG, an equipment supplier/building Subcontractor for all four of the WTP pump houses. There are 2 fire water pump houses, each consists of one engineered skid-mounted diesel engine driven fire pump with associated apparatus, diesel fuel day tank, piping, valves, and diesel engine driven fire pump controller; one motor driven jockey pump with associated piping, valves and jockey pump controller; and one motor driven heater circulation pump and two stage electric heaters with associated piping, valves, and recirculation pump and heater controllers for freeze protection. The diesel fuel oil pump house contains two transfer pumps used to distribute diesel fuel oil to end-use day tanks. The NLD pump house contains two redundant horizontal constant speed centrifugal transfer pumps and two vertical constant speed centrifugal sump pumps.

The following required performance specifications pertaining to maintenance of pump house equipment are provided in 24590-BOF-3PS-G000-T0003, Rev 1, *Performance Specification for BOF Pump House Facilities,* dated December 8, 2003.

I. Subcontractor submittals:

Operation and maintenance directory

List of documents
List of systems
List of equipment
Table of contents

Maintenance manuals for the care and maintenance of systems and equipment.

II. Systems and Equipment Maintenance Manual:

For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below:

(1) Source information

List each system, subsystem, and piece of equipment included in the manual, identified by product name, and arranged to match the manual's table of contents. For each product, list the name, address, and telephone number of the installer or supplier and maintenance service agent, and cross-reference the specification's section number and title in the project manual.

(2) Manufacturers' maintenance documentation:
Maintain manufacturers' maintenance documentation, including the following information for each component part or piece of equipment:
- Standard printed maintenance instructions and bulletins
- Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
- Identification and nomenclature of parts and components.
- List of items recommended to be stocked as spare parts.

(3) Maintenance and service schedules:
Include service and lubrication requirements, list of required lubricants and approved alternatives for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- Scheduled maintenance and service: tabulate actions for daily, weekly, monthly, quarterly, semi-annual, and annual frequencies.
- Maintenance and service record: include manufacturers' forms for recording maintenance.

(4) Spare parts list and source information:
Include lists of special tools, replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation, and local sources of maintenance materials and related services.

(5) Environmental conditions:
Include a list of environmental conditions (temperature, humidity, and other relevant data) best suited for each product or piece of equipment, and describe the conditions under which equipment should not be allowed to run.

(6) Warranties:
Include copies of warranties and lists of circumstances and conditions that would affect the validity of warranties.
- Include procedures to follow and required notifications for warranty claims.

A single contract was awarded to Morse, a Design/Build Subcontractor for all the WTP field erected tanks. There are two FSW storage tanks, one DFO storage tank, one NLD storage tank, one DOW storage tank, one DIW storage tank; one PSW feed tank and one PSW supply tank. The tanks are steel, above-ground storage tanks complete with ladders, platforms, insulations, tank internal piping, piping supports, internal structural support as required, impressed cathodic protection system and appurtenances as required. The DFO storage tank is contained within a walled area designed to provide containment, in the event of leakage/rupture of the tank.

The following performance specifications for lay-up and maintenance of field erected tanks are contained in 24590-WTP-3PS-MTF5-TT0001, Rev. 0, Engineering Specification for *Field-Erected Tanks Design and Fabrication*. Section 8, Preparation for Completion requires the following:
- Machined carbon steel surfaces, which are not protected by blind flanges, shall be coated with rust preservative.
- All flanged openings, which are not provided with a cover, shall be protected by an ASME B16.5 carbon steel blind flange of the same rating as the flange, a full-faced rubber gasket with a minimum thickness of 1/8 inch and carbon steel bolts with stainless steel washers.

These items appear to be requirements for lay-up of the FET's prior to turnover to BNI.
Included in section 9, Documentation and Submittals is listed "maintenance manuals".

The Quality Verification Report Package, *24590-SM-HC1-MPGP-00001, BOF Pump House Facilities"*, and the operation & maintenance manuals, 24590-CM-HC1-MPGP-00001-38-00001, Fuel Oil Pump house building 81, *24590-CM-HC1-MPGP-00001-38-00002, NLD building 54, and 24590-CM-HC1-MPGP-00001-38-00008, Fire Water Pump house building 84Aand 84B* were provided in the project document control office for my review.

These documents are currently in review by BNI and have not been released yet. The documents were found to generally contain the required information per the engineering specifications for the pump houses and for the field erected tanks. However, noted is the fact that none of the operation & maintenance manuals include information and/or requirements for maintenance of the equipment before operations? Although, this was not a requirement within the engineering specifications for either the field erected tanks or the pump houses, since this project will not be operating for several years, BNI should require their subcontractors to specify any required maintenance of equipment that is in this type of long term lay-up to assure the equipment is kept in running order.

Field Interviews: The following discussion presents the information obtained from several different interviews with BNI personnel.

Both the FETs (Morse) and Pump house (RTG) Subcontracts are in the acceptance phase of the closeout/turnover process. Both Subcontracts have punchlist generated and currently being worked. The FETs have nine items not closed on the punchlist and the pump houses have 18 open items. I asked but was not provided with a schedule for working these items off and completion of the punchlist. The FET's require very little maintenance; however several of the open items on the provided FET punchlist are clearly items to be complete for a sound and secure lay-up of the tanks. For instance install anchor washers at DOW, DFO, and NLD tanks, complete bolting on NLD tank shell and apply coatings to all tanks are still open items. The pump houses each contain equipment that require maintenance (exhaust fans, motors, valves, pumps, heaters), most notable of open items on this punchlist include fire pump A & B long term maintenance run has not been performed and is out of date. BNI said that a CDR would be written on this. Later, BNI reported that a field change (24590-WTP-FC-06-0017) has been issued on the fire pump engines, recommending a long term lay up procedure that does not require engine operation. BNI startup and operation experience indicates that repeated short duration engine operation will lead to excessive engine carbon build up and could negatively impact the long term serviceability of the engine. In light of the field change under review by engineering a CDR will not be written unless the field change is denied. In addition there are 2 fire water jockey pumps in the fire water pump houses that need to be replaced, due to an identified need by engineering for bigger pumps, and an unclosed firewater sprinkler line pressure test report NCR and CDR-CON-05-0124.

Although pump house equipment has been onsite for an extended amount of time, turnover of the equipment to BNI is necessary before the C&T group establishes or implements its preservation and maintenance program. Preservation and maintenance on equipment/systems not yet accepted by BNI is tracked and documented per the subcontractors program. BNI surveys subcontractors program and validates adequate performance during the acceptance from subcontractor phase. Maintenance of Subcontract equipment, systems and facilities is the responsibility of the Subcontractor until the system/facility has been turned over to BNI Construction, at that point BNI C&T, enter the data into CMMS and the maintenance becomes the responsibility of C&T in accordance with 24590-WTP-CON-6201, Rev 4, *Equipment Preservation and Maintenance.* During interviews with C&T staff, it was determined that this document is being revised and is due out in March 2006. It appears that the status of maintenance on equipment, systems/facilities under the responsibility of the Subcontractor is not closely tracked until during the turnover process when maintenance records are submitted as part of the turnover package. It could be argued that this was adequate until recently when schedule delays have occurred and are anticipated in the future schedule. The delay in finishing the subcontract turnovers is beginning to have impacts on required maintenance of DOE owned property, for instance the fire water pumps mentioned above. As most of the Subcontractors have been demobilized from the Site it is imperative to get the turnover of this equipment, systems/facilities completed as soon as possible so that the maintenance responsibility will be with an onsite group (C&T), who can be tracked more closely and can more readily perform needed maintenance.

During field walk downs of the FET's and pump houses the referenced engineering drawings were utilized. The walk downs revealed pump house equipment and facilities are generally in good shape. Heaters are activated and running to keep the pump houses at specified temperature during the cold months, and exposed pipes are covered. The FETs are also generally in good shape; however several flanged tank openings are not covered and/or are not covered according to the engineering specification, *24590-WTP-3PS-MTF5-TT0001, Rev. 0,* Engineering Specification for *Field-Erected Tanks Design and Fabrication.* The specification requires, "all flanged openings, which are not provided with a cover, shall be protected by an ASME B16.5 carbon steel blind flange of the same rating as the flange, a full-faced rubber gasket with a minimum thickness of 1/8 inch and carbon steel bolts with stainless steel washers". Some of the openings (19) are covered with the required carbon steel blind flange, rubber gasket, and carbon steel bolts with stainless steel washers, several have a plastic mesh wrap covering the openings (2

DOW tank, 2 DIW tank, 2 on each PSW tank, 2 on each FSW tank, and 3 NLD tank) and some are not covered at all (3 DFO tank, 2 on each FSW tank, 3 NLD tank). Of particular note, one of the flange openings on the DFO tank was equipped with a carbon steel blind flange but it was wide open and this particular opening is large enough and is located down far enough on the tank wall that access into the tank is possible, no confined space entry signs were identified. This was reported to the ORP Field Representative as a safety concern, but the ORP FR stated that the tank although would be considered a confined space is not a "permitted" confined space and therefore does not require entry restrictions. The uncovered flanges and plastic wrapped flanges (not to spec) may be written up in this assessment as a "Finding". Also noted on the walk down were the anchor washers at the DOW, DFO, and NLD tanks that still need to be installed and the anchor bolts at the DOW tank and NLD tank that are still not installed.

Previous inspection notes by RI Taylor, ORP (A-05-AMWTP-RPPWTP-002-65) dated May 18, 2005 noted the inability to obtain evidence of subcontractor performed preservation and maintenance activities at the four pump house Facilities. An assessment follow-up item was assigned (A-05-AMWTP-RPPWTP-002-A014) to follow the Contractor's actions to establish and implement a preservation and maintenance program for WTP equipment in the custody of site subcontractors. On December 22, 2005 the Contractor opened RITZ item 24590-WTP-RITS-QAIS-05-1341 that contains the action to evaluate available preventive maintenance records for construction complete subcontracts to identify equipment needing further evaluation and disposition. This evaluation includes the pump houses and field erected tank subcontracts. Any equipment maintenance concerns are to be resolved or the appropriate tracking document (CDR) is to be initiated.

**Conclusion:**

The Design Oversight concluded the BNI preventative maintenance, lay-up and turnover of the field erected tanks and pumphouse facilities have not yet been completed by existing approved procedures. Both the FETs and pump house facilities subcontracts are currently in the acceptance phase. A punchlist has been generated for both subcontracts but still have several open items. Even though the pump house equipment has been onsite for an extended amount of time, turnover of the equipment to BNI Construction has to occur before the BNI C&T group establishes or implements its preservation and maintenance program. Preservation and maintenance on equipment/systems not yet accepted by BNI is tracked and documented per the subcontractors program. The BNI subcontractor oversight organization needs to establish requirements and verify implementation of the subcontractors' preservation and maintenance programs for equipment installed at the WTP site and not immediately turned over to the C&T group. Previous field assessment, A-05-AMWTP-RPPWTP-002-65, by RI Taylor in May 2005 assigned assessment follow-up item A-05-AMWTP-RPPWTP-022-A014 to track BNI's actions to establish and implement a preservation and maintenance program for the WTP equipment in the custody of site subcontractors. A RITZ was initiated by BNI on December 22, 2005, to evaluate available preventive maintenance records from both subcontracts and resolve any maintenance concerns and/or initiate construction deficiency reports (CDRs) as needed. This work is still in progress. The turnover of WTP equipment in the custody of site subcontractors needs to take place more efficiently in a timelier manner, through closer coordination of subcontractor, BNI subcontractor organization and BNI C&T group.

Open Item: Several flanged opening on Field Erected Tanks do not have the required cover, per engineering specification, 24590-WTP-3PS-MTF5-TT0001, Rev. 0, Engineering Specification for *Field-Erected Tanks Design and Fabrication*. The specification requires, "all flanged openings, which are not provided with a cover, shall be protected by an ASME B16.5 carbon steel blind flange of the same rating as the flange, a full-faced rubber gasket with a minimum thickness of 1/8 inch and carbon steel bolts with stainless steel washers". Several flanged opening are wrapped with a plastic mesh wrap and others are not covered at all.

Open item: BNI development of procedures and implementation of procedures for preservation of DOE owned assets (FETs and pump house equipment/facilities) during the interim period between installation and turnover to C&T needs to be tracked.

**Submitted By:** Carol Babel **Approved By:** _____
**Date: February 9, 2006** **Date:**

**Personnel Interviewed:**

BNI:
W. Clements
J. Wright
S. Polvi
T. Dallas
B. Lynch
T. Burks

ORP:
B. Taylor

ORP Assessment Team Members:
M. Ryan
J. Orchard
J. Adams

## DESIGN OVERSIGHT NOTE

**Design Oversight Note Number: D-05-DESIGN-019-01**

**Assessors Names(s) James Adams Dates of Inspection: Nov. 28-Dec. 28, 2005**

**Area/Items(s) Reviewed: BNI Lay-up and Turnover of Balance of Facility Systems**

The Design Oversight reviewed the Contractor and subcontractor documentation of Balance of Facility (BOF) Cooling Tower and Support System and conducted interviews with the Contractor management and staff relative to the lay-up, preventative maintenance, and turnover of the system.

**Observations and Assessments**

Engineering Management Oversight

Documents Reviewed:

- 24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005
- 24590-WTP-GPP-CON-4103, Rev. 0, *Subcontract Surveillance, Acceptance, and Closeout,* dated July 24, 2004
- 24590-CM-HCi-Mecm-00001-14-00067 Rev. 00B, *Facility Lay-up Procedure*, dated February, 2005,
- Memo from J. W. Wilson to M.N. Brosee, dated May 12, 2005, CCN 100398, Division of Responsibility-Construction Department and Commissioning and Training Department for Preservation Maintenance
- 24590-WTP-GPP-CON-7113, Rev. 1, *Construction Record Completion*, dated July, 20, 2005
- 24590-WTP-GPP-CON-1602, Rev. 0, *System and Area Completion and Turnover*, dated March 16, 2005
- 24590-WTP-RPT-CN-01-004, Rev. 1, *Construction and Acceptance Testing Program*, dated November 15, 2003
- 24590-WTP-Gpp-CON-4101, Rev. 7, *Construction Subcontract Management*, dated June 23, 2005
- 24590-WTP-GPP-CON-7105, Rev. 2, *Subcontractor Submittals*, dated October 13, 2004
- 24590-CM-HC1-MECM-00001-44-00004, Rev. 00A, *Quality Verification Record Package*, undated
- 24590-WTP-HC1-MECM-00001, *Subcontractor Submittal Transmittal 188 for Cooling Tower Facility*, dated November 21, 2005
- 24590-WTP-RITS-QAIS-05-1341, Subcontractor Preventative Maintenance Requirements Review, dated December 22, 2005

The oversight reviewed the procedures and documentation associated with the preventative maintenance of the system. Specifically, the design oversight reviewed the subcontractor submittal (24590-WTP-HC1-MECM-00001, *Subcontractor Submittal Transmittal 188 for Cooling Tower Facility*, dated November 21, 2005) documenting the preventative maintenance completed by the subcontractor. In addition, the design oversight reviewed a procedure (24590-CM-HCI-MECM-00001-14-00067 Rev. 00B, *Facility Lay-up Procedure*, dated February, 2005) for the long term lay-up of the Cooling Tower and Support System. However, the subcontractor had not been contracted to implement this procedure. The procedure for completion of the procedurally defined lay-up of the system in accordance with the identified procedure (24590-WTP-GPP-CON-6201, Rev 4, *Equipment Preservation and Maintenance*, dated June 28, 2005) was to be implemented by the BNI C&T organization following the completion of the turnover from the subcontractor to BNI. Based on interviews with the BNI Subcontractor Administrator it was determined the turnover had not yet been completed. The review determined the maintenance records for the vertical turbine pump and motor were submitted and had been performed to some degree although some items were NA'ed with no explanation why the deviation from manufacturer's recommendation. In addition, the motors had not been provided temporary power to energize the motor heaters according to the records. The remainder of the lay-up procedure (Sections 3.0, 4.0, and 5.0) dealing with the cooling towers, the chemical feed system, and the electrical equipment, respectively) had no record of performance. The design oversight concluded the procedurally addressed lay-up had not been completed and the preventative maintenance was not yet the responsibility of the C&T organization because the turnover had not been accepted.

The Contractor initiated a problem report 24590-WTP-RITS-QAIS-05-1341 during the oversight interview which indicated BNI needed to re-address the preventative maintenance program for long term lay-up and to review the subcontractor maintenance records to determine what BNI needed to do prior to turnover to commissioning. This RITS item was limited to subcontractor equipment.

During this same interview, it was determined that the turnover of the system had been rejected by BNI and had been returned to the subcontractor who had already demobilized and had submitted documents to turnover. However, since the subcontractor has demobilized, it was not clear to the design oversight how the preventative maintenance would be maintained or how turnover would be completed.

**Conclusion:**

The Design Oversight concluded the BNI preventative maintenance, lay-up and turnover of the subcontractor system Cooling Tower and Support Systems was not yet completed by existing approved procedures. The failure to implement the engineering approved lay-up and preventative maintenance per the vendor/subcontractor recommendations will be tracked by assessment follow-up item AFI A-05-WED-06-019-A01 since the equipment is not yet turned over to BNI. In addition ORP has issued correspondence in letter WED-06-001 dated January 26, 2006 which detail this issue and requests corrective action.

**Submitted By:** 4/5/06 **Approved By:**_____
**Date:** **Date:**

**Personnel Interviewed:**

J. Wright