**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 30, 2009

Mr. Ashok S. Bhatnagar
Senior Vice President
Nuclear Generation Development and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2009602

Dear Mr. Bhatnagar:

On March 31, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of construction activities at your Watts Bar Unit 2 reactor facility. The enclosed integrated inspection report documents the inspection results, which were discussed on April 9, 2009, with Mr. Masoud Bajestani and other members of your staff.

This inspection examined activities conducted under your Unit 2 construction permit as they relate to safety and compliance with the Commission's rules and regulations, with the conditions of your construction permit, and with fulfillment of Unit 2 regulatory framework commitments. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding which was determined to involve a violation of NRC requirements. However, because this finding was a Severity Level IV violation and was entered into your corrective action program, the NRC is treating it as a non-cited violation consistent with Section VI.A of the NRC Enforcement Policy. If you contest the non-cited violation in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTENTION: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at the Watts Bar Unit 2 Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Robert C. Haag, Chief
Construction Projects Branch 3
Division of Construction Projects

Docket No. 50-391
Construction Permit No: CPPR-92

Enclosure: Inspection Report 05000391/2009602 w/attachments

cc w/encl: (See next page)

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Robert C. Haag, Chief
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cc w/encl: (See next page)

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| NAME | WBearden | TNazario | HAbuseini | AIssa | P VanDoorn | CFong | JBartleman |
| DATE | 4/30/2009 | 4/30/2009 | 4/30/2009 | 4/30/2009 | 4/30/2009 | 4/30/2009 | 4/30/2009 |
| E-MAIL COPY? | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO |

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Letter to Ashok S. Bhatnagar from Robert C. Haag, April 30, 2009

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2009602

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

| | |
|---|---|
| Docket No.: | 50-391 |
| Construction Permit No.: | CPPR-92 |
| Report No.: | 05000391/2009602 |
| Applicant: | Tennessee Valley Authority (TVA) |
| Facility: | Watts Bar Nuclear Plant, Unit 2 |
| Location: | 1260 Nuclear Plant Rd<br>Spring City TN 37381 |
| Dates: | January 1 - March 31, 2009 |
| Inspectors: | W. Bearden, Senior Resident Inspector, Construction Projects Branch 3 (CPB3), Division of Construction Projects (DCP) Region II (RII)<br>T. Nazario, Resident Inspector, CPB3, DCP, RII<br>H. Abuseini, Resident Inspector, CPB3, DCP, RII<br>A. Issa, Project Inspector, CPB3, DCP, RII (Sections E.1.1, E.1.2)<br>J. Bartleman, Senior Construction Inspector, Construction Inspection Branch 2, Division of Construction Inspection (DCI), RII (Sections C.1.1, C.1.3, Q.1.1, Q.1.2)<br>C. Fong, Construction Project Inspector, CPB2, DCP, RII (Sections E.1.2, F.1)<br>P. VanDoorn, Consultant, CPB3, DCP, RII (Sections Q.1.1, Q.1.3, Q.1.4) |
| Approved by: | Robert C. Haag, Chief<br>Construction Projects Branch 3<br>Division of Construction Projects |

Enclosure

## EXECUTIVE SUMMARY

Watts Bar Nuclear Plant, Unit 2
NRC Inspection Report 05000391/2009602

This integrated inspection included aspects of engineering and construction activities performed by TVA associated with the Watts Bar Unit 2 construction project. This report covered a three-month period of inspections in the areas of quality assurance; identification and resolution of construction problems; employee concerns program; construction activities; engineering activities; procurement; training and qualification of plant personnel; and fire protection. The inspection program for Unit 2 construction activities is described in NRC Inspection Manual Chapter (IMC) 2517. Information regarding the Watts Bar Unit 2 Construction Project and NRC inspections can be found at http://www.nrc.gov/reactors/plant-specific-items/watts-bar.html.

The inspectors concluded that TVA continued to implement adequate controls to conduct ongoing procurement, design, and construction activities. The inspection identified one NRC-identified Severity Level (SL) IV Non-Cited Violation (NCV).

Inspection Results

- A SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for failure to accomplish activities affecting quality in accordance with instructions and procedures. The inspectors identified three examples associated with scaffolding deficiencies where procedural requirements were not implemented in accordance with applicant procedure MMTP-102, "Erection of Scaffold/Temporary Work Platforms and Ladders." TVA entered the issue into the corrective action program and, as part of the corrective actions, immediately corrected the scaffolding to comply with procedural requirements, conducted an apparent cause evaluation and completed appropriate engineering evaluations.

  The inspectors determined that this finding was more than minor because the finding represented an improper/uncontrolled work practice and represented a deviation that, if left uncorrected, could potentially adversely affect the seismic qualification of a system structure or component (SSC). The cause of this finding was directly related to the work practices component of the Human Performance cross-cutting area because TVA and Bechtel did not define and effectively communicate expectations regarding procedural compliance and as a result personnel failed to follow procedures (H.4.b). (Section E.1.1)

- Management and quality assurance (QA) oversight and TVA's and Bechtel's processes for identification and resolution of problems continued to be adequate. The inspectors also determined that the inspection sample requirements for some NRC inspection procedures were completed for the purposes of assessing the readiness of TVA and Bechtel to conduct construction activities. (Sections Q.1.1, Q.1.2, Q.1.3, Q.1.4, Q.1.5, E.1.1 E.1.2 and Attachment 3)

- A review, called the reconstitution process, of historical NRC inspection reports was completed to determine the status of previously performed inspections in satisfying the requirements specified in the construction inspection procedures. (Section OA.1)

- Other areas inspected were adequate with no findings of significance identified. These areas included physical walkdowns, ongoing construction activities, protection of installed equipment, employee concerns, procurement, document control, training, and fire protection.

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## REPORT DETAILS

Summary of Plant Status

During the current inspection period, TVA continued to develop construction procedures and work instructions. Engineering design activities and physical plant walkdowns to determine the existing status of structures, systems, and components (SSCs) also continued during this inspection period.

### I. Quality Assurance Program

### Q.1 Quality Assurance (QA) Oversight Activities

#### Q.1.1 Licensee Management of QA Activities (Inspection Procedure (IP) 35060)

a. Inspection Scope

During this inspection period, the inspectors focused inspection efforts on assessing the readiness of TVA and Bechtel to conduct construction activities. This inspection is a follow-up to an initial inspection conducted in March 2008 and documented in Inspection Report 05000391/2008006. Subsequent inspections were performed utilizing applicable NRC inspection procedures and documented in NRC Inspection Reports 05000391/ 2008007, 2008009, and 2008010. The inspectors reviewed the latest revision of the Bechtel Project Nuclear Quality Assurance Manual, Revision 3, to confirm that there were no substantive changes which affected QA effectiveness, that QA independence was maintained, and that administrative requirements, such as management approvals, were met.

The inspectors also reviewed problem evaluation reports (PERs) as part of TVA's corrective action program to verify that issues being identified under the corrective action program were being properly identified, addressed, and resolved by TVA. Additionally, the inspectors reviewed several construction completion project quality surveillance reports of reviews performed on field change requests and drawing revision authorizations. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The revision described above to the Bechtel Project Nuclear Quality Assurance Manual met requirements, and QA effectiveness was not reduced by the change. Overall, adequate management and QA oversight was in place commensurate with activities in progress.

In addition, the inspections documented in this inspection report coupled with previous inspections documented in NRC Inspection Reports 05000391/2008006, 2008007, 2008009, and 2008010 completed the inspection requirements for IP 35060 from a construction readiness standpoint. Additional samples utilizing this inspection procedure may be conducted during future inspections as needed or as required by the specified frequency. See Attachment 3 to this inspection report.

**Q.1.2 In-Depth Inspection of QA Performance (IP 35061)**

a. Inspection Scope

The inspectors reviewed and observed site work and verified that it was being performed in accordance with NRC requirements, safety analysis report (SAR) commitments, and implementing procedures. The inspectors also reviewed and inspected the QA / Quality Control (QC) program to verify that requirements and commitments were being met and that prompt and effective action was taken to achieve permanent corrective action on significant discrepancies.

The inspectors verified by physical examination of purchased items that the items met design and purchase order (PO) requirements. The inspectors also reviewed pertinent documentation including individual certification/certificates of conformance, to ensure that the items were properly qualified according to 10 CFR 50 Appendix B, and met the design intent. The inspectors specifically reviewed documentation and physically inspected items associated with PO 00001827-04188 which included different sized American Society of Mechanical Engineers (ASME) Section III Class II studs and PO 0004248-00840 which included the following ASME Section III Class II items:

- One 1” pipe cap, ASME SA105
- Three 6” 90 degree elbows ASME SA234 Grade WPB, LR, Schedule 80
- One 20’ pipe ASME SA 106 Grade B Schedule 80

These items are further discussed in Section E.1.2, Procurements Activities. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that TVA and Bechtel continue to have adequate QA oversight commensurate with the level of activity and adequate corrective actions are being implemented.

In addition, the inspections documented in this inspection report coupled with previous inspections documented in NRC Inspection Reports 05000391/2008006, 2008007, 2008009, and 2008010 completed the inspection requirements for IP 35061 from a construction readiness standpoint. See Attachment 3 to this inspection report.

### Q.1.3 Review of QA Manual (IP 35100)

a. Inspection Scope

The inspectors reviewed work and quality inspection procedures for construction activities, as well as for test control and control of test equipment, to confirm that these documents conformed to the approved QA program, met applicable QA administrative requirements, were issued to cover significant expected construction activities, were adequately controlled, and contained expected QA criteria (e.g. inspection hold points). The inspectors also held discussions with TVA and Bechtel personnel regarding the status of these activities.

Additionally, the inspectors reviewed measuring and test equipment (M&TE) procedures and verified that test acceptance criteria were specified to assure adequate controls, calibration and adjustment of the M&TE. The inspectors also confirmed that adequate methods were in place for establishing traceability of an inspected/tested work activity to the instrument used for acceptance purposes. The inspectors reviewed the current M&TE lists and calibration certificate for a surface thermometer, instrument number 60027539. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that TVA and Bechtel had established procedures required to conduct construction activities. These procedures were approved and controlled in accordance with QA requirements and included expected QA criteria. This inspection sample, coupled with previous inspections documented in NRC reports 05000391/2008006, 2008009, and 2008010, completed the inspection requirements for IP 35100 for the purpose of assessing the readiness of TVA and Bechtel to conduct construction activities. See Attachment 3 to this inspection report.

### Q.1.4 Identification and Resolution of Construction Problems (IP 40504)

a. Inspection Scope

The inspectors reviewed the self-assessment program procedure, a QA audit, several Bechtel QA reports, an applicant QA report, and selected PERs in order to assess QA oversight and adequacy of corrective actions. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified. The self-assessment program procedure was adequately written and provided guidance for selection of assessors, planning, defining personnel responsibilities, handling of findings and observations, and documentation.

c. Conclusions

The inspectors determined that TVA and Bechtel continued to maintain adequate QA oversight commensurate with the level of activity and implement appropriate corrective actions.

**Q.1.5 Safety Conscious Work Environment (IP 40504)**

a. Inspection Scope

During this inspection period, the inspectors focused on TVA's and Bechtel's programs for resolving employee concerns. This inspection is a follow-up to an initial inspection conducted in March 2008 and documented in Inspection Report 05000391/2008006 which assessed the readiness of TVA and Bechtel to conduct construction activities. This review included interviews with site employee concern representatives, evaluation of employees' access to the employee concerns representative, review of a listing of new employee concerns, evaluation of any anonymous concerns, and corrective actions for selected concern files to evaluate the adequacy of the programs to provide employees with an alternate method to identify quality or safety-related concerns. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified. The inspectors determined that TVA's and Bechtel's employee concern programs were well managed and staffed with capable personnel.

c. Conclusions

The inspectors determined that TVA and Bechtel had established an acceptable program and environment for allowing employees to identify quality or safety-related concerns

The inspections performed in this section and in section Q.1.4 above, coupled with previous inspections documented in NRC reports 05000391/2008006, 2008009, and 2008010, completed the inspection requirements for IP 40504 for the purpose of assessing the readiness of TVA and Bechtel to conduct construction activities.

**II. Management Oversight and Controls**

**C.1 Construction Activities**

**C.1.1 Walkdowns (IPs 35061 and 50090)**

a. Inspection Scope

The inspectors observed the field walkdown of Hanger/Support #2-03A-459 inside Unit 2 containment per Work Package WBN2-PD-003-1798-04. This activity was part of TVA's program to verify the field condition of safety-related hangers and supports. The

inspectors reviewed TVA's procedure WDP-PD-2, "Walkdown Procedure for Piping and Pipe Supports" to determine whether adequate guidance to provide assurance of quality control and field work being performed. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 50090 Section 02.01.a - one sample
- IP 50090 Section 02.03.f - one sample

b. Observations and Findings

No findings of significance were identified. The inspectors determined that the hanger walkdown activity, including independent verification of hanger/support measurements, was being properly conducted.

c. Conclusions

The inspectors determined that walkdown activities for safety-related pipe hangers and supports were being performed in accordance with applicable procedures and documented appropriately.

**C.1.2 Protection of Installed Plant Equipment during Construction Activities (IPs 50051, 50053, and 50055)**

a. Inspection Scope

The inspectors conducted inspections of the reactor pressure vessel (RPV) core barrel and lower internals storage, preservation, housekeeping, and protection activities to determine whether requirements, work procedures, and inspection (QC) procedures were being met. On February 25, 2009, the inspectors entered the RPV core barrel and lower internals to observe the current condition and housekeeping measures in place.

The inspectors reviewed housekeeping procedure 25402-000-GPP-0000N2102 which establishes the measures for protection and cleanliness and reviewed associated records. The inspectors reviewed the Controlled Cleanliness Zone Area Registry Log, Attachment E of the Housekeeping procedure, and sampled some of the areas to verify that adequate controls and proper postings were in place. The inspectors also reviewed two PERs associated with the storage, preservation, housekeeping, and protection of the RPV. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 50051 Section 02.04.e - one sample
- IP 50053 Section 02.01.c - one sample
- IP 50053 Section 02.03.b - one sample
- IP 50053 Section 02.03.d - one sample
- IP 50055 Section 02.02.b - one sample
- IP 50055 Section 02.02.c - two samples

b. Observations and Findings

No findings of significance were identified. The inspectors observed that TVA implemented adequate foreign material exclusion controls associated with activities in the RPV core barrel and lower internals. This included the installation of a protective covering over the top of the RPV core barrel and internals to prevent entry of foreign objects and debris and the entry control of tools, equipment, and personnel. TVA and Bechtel established a baseline housekeeping assessment for controlled cleanliness zones, including the RPV.

c. Conclusions

Adequate controls were in place to protect the RPV core barrel and lower internals.

### C.1.3 Electrical Penetrations (IPs 51051, 51053, 51055, 53053, and 53055)

a. Inspection Scope

The inspectors witnessed the sealing of electrical penetrations associated with the Auxiliary Building Secondary Containment Enclosure (ABSCE) boundary modification in support of the temporary openings in Unit 2 containment. These openings will allow personnel and equipment access directly into Unit 2 without having to enter through the Unit 1 Radiologically Controlled Area (RCA). The inspectors witnessed sealing activities for penetrations A12248, A12249, and A12251 with construction personnel working under work order (WO) 07-823169016, UNID WBN-0-MISC-304.

The inspectors also reviewed corrective actions associated with PER 163249 which documented improper sealing of electrical floor penetration A12424. Records for the work and inspection of these penetrations were reviewed to determine whether requirements had been met. Additionally, IPs 53053 and 53055 were used as guidance. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 51051 Section 02.02.c - one sample
- IP 51051 Section 02.02.e - one sample
- IP 51053 Section 02.01.f - one sample
- IP 51053 Section 02.02.d - one sample
- IP 51053 Section 02.02.e - one sample
- IP 51055 Section 02.02.c - one sample
- IP 51055 Section 02.02.d - one sample
- IP 51055 Section 02.04 - one sample

b. Observations and Findings

No findings of significance were identified. The improper sealing of electrical floor penetration A12424 was determined not to be a violation of regulatory requirements.

c. Conclusions

Activities for installing and replacing electrical penetration seals were being conducted in accordance with procedures.

### C.1.4 Safety Related Piping Work Observation (IPs 49063, 49065, 55050)

a. Inspection Scope

The inspectors observed work in progress associated with the removal of a 6-inch TVA Class B (ASME Section III, Class 2) pipe near Penetration 47A and replacement with new pipe section meeting ASME Class 2 requirements. The replacement was performed in support of system completion for the glycol piping in the ice condenser system. The work was being performed under WO 08-952876-000 and engineering document construction release (EDCR) 52612. The inspectors observed handling, cleanliness control, installation of pipe, cutting, and grinding and reviewed field drawings, procedures, material specifications, material test reports, gas tungsten arc welding (GTAW) weld performance test qualification test record, and documentation of quality-related inspections. Radiographic test (RT) non-destructive examination (NDE) was reviewed and documented separately in Section C.1.5. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 49063 Section 02.01 - one sample
- IP 49063 Section 02.02 - one sample
- IP 49063 Section 02.03 - one sample
- IP 49065 Section 02.01 - one sample
- IP 55050 Sections 02.06.a - one sample
- IP 55050 Sections 02.06.b - one sample
- IP 55050 Sections 02.06.c - one sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The activities observed relative to safety-related piping were adequate and completed in accordance with applicable drawings and specifications.

### C.1.5 Radiograph Film Interpretation of Safety-Related Welds (IP 57090)

a. Inspection Scope

The inspectors reviewed radiographs of two completed welds on safety-related piping. These welds were the first new ASME piping welds performed by Bechtel since construction reactivation. Additionally, these welds were performed in support of ongoing modifications in support of moving the existing ABSCE boundary. Radiographs were reviewed to determine

whether they were prepared, evaluated, and maintained in accordance with applicable commitments and/or requirements.

Specific radiographs reviewed included the following:

| Report # | Weld ID | Component |
|---|---|---|
| RT001 | S61GLYCOLFW-6A | 6 Inch diameter Ice Condenser Glycol Piping |
| RT002 | S61GLYCOLFW-6B | 6 Inch diameter Ice Condenser Glycol Piping |

Both welds were performed using the gas tungsten arc process in six-inch diameter ASME Class 2 piping in ice condenser system.

The records were compared to the applicable code (ASME Boiler and Pressure Vessel Code, Section III, 1971 Edition with Addenda through Summer 1973) to verify compliance. Additionally, the inspectors reviewed qualification records and eye examination documentation for the associated NDE examiners. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 57090 Section 02.03.a - two samples
- IP 57090 Section 02.03.b - two samples
- IP 57090 Section 02.03.c - two samples
- IP 57090 Section 02.03.d - two samples

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that the reviewed radiographs met applicable ASME code requirements and other regulatory requirements.

### C.1.6 Liquid Penetrant Examination of Safety-Related Welds (IP 57060)

a. Inspection Scope

The inspectors reviewed the liquid penetrant report for the completed NDE for two safety-related attachment welds associated with the Unit 2 steel containment vessel. The liquid penetrant report was reviewed to determine whether it was prepared, evaluated, and maintained in accordance with applicable commitments and/or requirements.

The inspectors reviewed NDE Report PT-004 which documented the liquid penetrant examination of containment attachment welds FW-04 and FW-05. Both welds were ASME Section III, Class MC welds. The nondestructive examination was performed as part of the base metal evaluation associated with PER 152573, which documented

unintended partial removal of the above two attachment welds. The welds had a portion of the base metal removed during the recent removal of temporary latching bars for the containment air lock.

The records were compared to the applicable code (ASME Boiler and Pressure Vessel Code, Section III, 1971 Edition with Addenda through Summer 1973) to verify compliance. Additionally, the inspectors reviewed qualification records and eye examination documentation for the associated NDE examiners. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 57060 Sections 02.03.a - two samples
- IP 57060 Sections 02.03.b - two samples
- IP 57060 Sections 02.03.c - two samples

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that the observed/reviewed NDE record met applicable ASME code requirements and other regulatory requirements.

**C.1.7 Electrical Systems and Components (IP 52051, 52053, 51061 and 51063)**

a. Inspection Scope

The inspectors observed and reviewed work associated with the point to point verification of wire within the solid state protection system (SSPS) cabinets. The SSPS is associated with the reactor trip system and the engineered safety features actuation system. The purpose of this verification was to determine the Unit 2 SSPS wiring configuration as compared to Unit 1 as-constructed drawings. The inspectors reviewed WOs 08-956285-000 and 08-956286-000.

The inspectors reviewed applicable work instructions to ensure that requirements were properly translated into the work procedures and that components had been correctly and permanently identified. The inspectors also verified cleanliness requirements had been maintained.

In addition, the inspectors performed a walkdown of cables in the annulus area and held discussions with TVA on PERs (162649 and 163461) related to unprotected and potential damaged cables. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 52051 Section 02.02.c - one sample

- IP 52053 Section 02.02.e - one sample
- IP 51061 Section 02.02.c - one sample
- IP 51061 Section 02.02.d - one sample
- IP 51063 Section 02.02.e - two samples

b. Observations and Findings

No findings of significance were observed.

c. Conclusions

Activities associated with electrical systems and components were adequate.

## E.1 Engineering Activities

### E.1.1 Engineering Organization, Document Control and Design Control (IPs 37055, 35061 and 35960)

a. Inspection Scope

The inspectors reviewed different types of engineering documents and interviewed personnel associated with ongoing design activities. The inspections covered procedure reviews; procedure implementation; calculations; specifications; drawings; design inputs; design interfaces with other disciplines/organizations; design verification of different engineering products; the use of design basis documents; the use of the master equipment list (MEL) database; document control; and associated PERs.

The inspectors reviewed ongoing design activities associated with TVA's plans to modify the auxiliary building secondary containment enclosure (ABSCE) boundary. This modification consisted of temporary construction openings being installed along the Unit 2 containment to support completion of work inside the Unit 2 reactor building. This interim ABSCE boundary and openings will allow direct access from the outside and minimize impact on Unit 1 by reducing access into the radiological controlled area. The inspectors observed the post modification test of the new interim ABSCE boundary and reviewed the test results. The inspectors also observed final installation and testing of the roll-up doors, and cutting activities of the new construction openings. After completion of Stage 3 of the ABSCE design package and following the recommendation to return the ABSCE to an operational status, the inspectors conducted an independent walkdown of the ABSCE boundary wall to verify that clearances between scaffolding and piping were maintained in accordance with applicable procedures. Specific documents reviewed are listed in Attachment 1.

b. Observations and Findings

One finding of significance was identified.

Engineering procedures reviewed appeared to be adequate and were being implemented correctly. The engineering calculations reviewed incorporated the

requirements of the design basis documents and implemented design interfaces correctly by using inputs from other calculations and transmitting outputs to other disciplines as required. Engineering specifications reviewed were completed in accordance with procedures and received the required reviews and certifications. Drawings reviewed were included in the EDCR packages and will only be issued as stand-alone documents once they reflect the as-constructed condition. As such, drawings reviewed did not include a separate independent design verification signature since they were independently reviewed as part of the review of the EDCR package. The inspectors noted that the WO procedure did not warn the users that the MEL had unverified fields and did not provide guidance on the handling of these fields. This was a concern for stand-alone WOs. PER 164596 was initiated to address this concern. Document control facilities were inspected at the site. The inspectors noted that the controls used were similar to those used for Unit 1.

Test results of the interim ABSCE boundary were adequate**.**

Introduction: The inspectors identified a Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings," for failure to accomplish activities affecting quality in accordance with instructions and procedures.

Description: On March 12, 2009, the inspectors conducted an independent walkdown of the interim ABSCE boundary and reviewed DCN 52283, which implements the ABSCE modification. This modification is in support of Unit 2 construction activities. The inspectors identified three examples associated with scaffolding deficiencies where procedural requirements were not implemented in accordance with applicant procedure MMTP-102, “Erection of Scaffold/Temporary Work Platforms and Ladders.”

During the walkdown, the inspectors identified two examples where scaffolding did not meet clearance requirements in accordance with MMTP-102. Specifically, scaffolding 13016-3 and 16516 were found to have clearance violations which were not noted or evaluated on the scaffolding evaluations and, therefore, did not have the appropriate engineering review. The scaffolding was installed by the Unit 2 construction organization in support of Unit 2 construction activities and was located adjacent to piping which penetrates the interim ABSCE boundary wall. This boundary serves to maintain an effective barrier for airborne radioactive contaminants released in the auxiliary building during abnormal events on Unit 1, the operating unit. Both scaffolding configurations had less than the required clearance between the scaffolding and piping that is part of the interim ABSCE boundary in the Unit 2 pipe chase. These configurations were not appropriately evaluated to ensure that the associated SSCs and their respective safety-related functions were not impacted by the scaffolding during a seismic event.

In addition to the above two examples, the inspectors also identified an example where actions to perform a final scaffolding walkdown, in accordance with MMTP-102, were not conducted. This final walkdown was to include scaffolding in the vicinity of the interim ABSCE boundary walls and was to be conducted prior to return to operations of Stage 3; which was to establish the new boundary as stated in the design document (DCN 52283). As a result of these issues, the applicant initiated Level “B” PERs 165792 and 165806 to address both the non-conforming clearances and the final walkdown not being performed.

The scaffolding was immediately corrected to comply with procedural requirements. An apparent cause and appropriate engineering evaluations were also conducted for the scaffolding. The engineering evaluation concluded the as-found clearances were acceptable from a seismic analysis standpoint.

The inspectors determined that this finding was more than minor because the finding represented an improper/uncontrolled work practice and represented a deviation that, if left uncorrected, could adversely affect the seismic qualification of a SSC. The finding was determined to be of very low safety significance because, while improperly installed scaffolding has the potential to adversely affect SSCs, the specific examples identified did not result in a loss of a safety function or barrier integrity on Unit 1 and did not render equipment inoperable on Unit 1 due to seismic requirements. Subsequent to the issues being identified, a walkdown of scaffolding in the vicinity of the interim ABSCE boundary wall was performed by TVA which resulted in the identification of three additional non-conforming clearance configurations between scaffolding and SSCs along the interim ABSCE boundary wall. The three additional non-conformance clearance configurations were resolved.

The cause of this finding was directly related to the work practices component of the Human Performance cross-cutting area because TVA and Bechtel did not define and effectively communicate expectations regarding procedural compliance and as a result, personnel failed to follow procedures (H.4.b). After further review of MMTP-102, the inspectors determined that the scaffolding procedure was adequate; however, as discussed in the examples above, the procedure was not followed on several occasions by different personnel. As part of the corrective actions documented in PER 165792, management plans to issue a construction bulletin to stress the importance of following work instructions and DCN requirements as written.

Enforcement: 10 CFR 50, Appendix B, Criterion V, “Instructions Procedures, and Drawings," states in part, that activities affecting quality shall be accomplished in accordance with prescribed instructions and procedures.

Contrary to the above, on March 12, 2009, the inspectors identified three examples where MMTP-102 procedural requirements were not implemented, therefore, affecting the quality of safety-related activities and SSCs. TVA and Bechtel initiated immediate actions to correct the scaffolding and performed walkdowns during which three additional non-conforming clearance issues were identified. This finding was determined to be a SL IV violation using Supplement II of the Enforcement Policy. Because this was a SL IV violation and because it was entered into the corrective action program as PERs 165792 and 165806, this violation is being treated as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy: NCV 5000391/2009602-01, Scaffolding Issues.

c. Conclusions

Activities associated with the ABSCE modification including testing were adequate with the exception of the procedural non-cited violation discussed above. In addition, the inspections documented in this inspection report coupled with previous inspections documented in NRC Inspection Reports 05000391/2008006, 2008007, 2008009, and 2008010 completed the inspection requirements for IPs 35061 and 35960 from a construction readiness standpoint. The inspection status of IP 37055 is shown in a table included in Attachment 3 to this inspection report.

### E.1.2 Procurement Activities (IPs 35060, 35065 and 35960)

a. Inspection Scope

The inspectors reviewed different types of procurement documents and interviewed personnel associated with ongoing procurement activities. The inspections covered: procedure reviews; procedure implementation; procurement data sheets (PDSs); POs; commercial grade dedication plans and packages; QA procurement interface; QA review of procurement documents; technical requirements in procurement documents; QA inputs to procurements; imposing 10 CFR Part 21; item acceptance; TVA's approved suppliers list (ASL) and Bechtel's evaluated suppliers list (ESL); interfaces with other disciplines/organizations; independent verification; review of procurement technical documentation by technical personnel; and associated PERs.

The inspectors reviewed TVA's procedure SPP-4.2, Material Receipt Inspection, Revision 20, and determined that it adequately implemented the receipt inspection requirements of American National Standards Institute (ANSI) N45.2.2, Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants.

Inspectors reviewed documentation associated with PO 00001827-04188 which included different sized ASME Section III Class II studs and PO 0004248-00840 which included the following ASME Section III Class II items:

- One 1" pipe cap, ASME SA105
- Three 6" 90 degree elbows ASME SA234 Grade WPB, LR, Schedule 80
- One 20' pipe ASME SA 106 Grade B Schedule 80

This review included procurement specifications, technical notes, material requirements details, nuclear supplier QA program requirements data sheets, PDSs, receipt verification/inspection requirements, and certificates of compliance.

The inspectors held discussions with TVA and Bechtel staff and reviewed activities, facilities, records, and procedures for procurement, receiving, and storage of items. The inspectors also reviewed the requirements specified in procurement documents for documentation and acceptance of safety-related items and inspected the facilities used for storage of these items. Documents reviewed are listed in Attachment 1.

b. Observations and Findings

No findings of significance were identified.

The inspectors observed that Bechtel was using the TVA process for procurement activities such as procurement engineering and commercial grade dedication. TVA's ASL is used except when purchasing ASME III products in which case Bechtel's ESL is used. Procurement documents reviewed such as PDSs, POs, and commercial grade dedication plans and packages complied with the applicable TVA procedures, received independent verification and included adequate technical requirements. Safety-related POs reviewed were issued to vendors listed on either the ASL or the ESL and invoked the requirements of 10 CFR Part 21. The inspectors could not find a defined QA

procurement interface. However, QA signed off on the material request forms and procurement used the ASL and the ESL that were compiled by QA for safety-related purchases. Procurement technical documentation and commercial grade dedication reports were reviewed by technical personnel. Receipt inspection reports reviewed determined the acceptance of purchased items.

The inspectors verified that specified design parameters for the POs were in accordance with those listed in applicable TVA specifications. Procurement specifications were found to have adequately identified applicable technical requirements as well as requirements pertaining to 10 CFR 21, Quality Assurance, Environmental Qualification, and acceptance of the items.

The inspectors observed the physical condition of the items associated with POs 0004248-00840 and 00001827-04188 and witnessed no signs of damage or deterioration. The inspectors also verified that adequate identification appeared on these and other items and that ASME items were clearly tagged and physically separated from non-ASME items.

The inspectors reviewed TVA's procedure SPP-4.3, Material Storage and Handling, Revision 6, and determined that it adequately implemented the storage requirements of American National Standards Institute (ANSI) 45.2.2. The inspectors reviewed TVA's periodic inspection records of the storage facilities to verify compliance with requirements for records of storage conditions. The inspectors also independently verified that the facilities used for onsite storage of items met the requirements specified by TVA's procedure. The inspectors observed that storage conditions were adequate, access to storage areas was controlled, items were identified with tags, and special storage requirements (e.g., physical separation of ASME components) were met. The inspectors inspected the receiving warehouse and observed designated areas where nonconforming items were to be segregated and tagged. The inspectors also reviewed EDCR 52621, Roll-up Doors and determined that the appropriate receiving inspection organization was aware of the source verification results for the design change.

c. Conclusions

The inspections documented in this inspection report coupled with previous inspections documented in NRC Inspection Reports 05000391/2008006, 2008007, 2008009, and 2008010 completed the inspection requirements for IPs 35060, 35065, and 35960 from a construction readiness standpoint. QA and management oversight of procurement activities was adequate.

## T.1 Training and Qualification of Plant Personnel

### T.1.1 Craft Training (IPs 35061, 46071 and 50090)

a. Inspection Scope

The inspectors observed activities associated with new employee indoctrination and training. The inspectors monitored craft classroom training sessions including required training for obtaining piping support data in support of piping support walkdowns. This training covered procedural requirements contained in WDP-GEN-1, Walkdown Procedure for General Walkdown Requirements. The inspectors also observed anchor

bolt classroom training and field demonstrations. As part of this training observation, the inspectors also reviewed procedures 25402-000-GPP-0000-N3212, Drilled-In Anchors and Core Drilling Operations, and MAI-5.1E, Expansion Shell Anchors Installation. Documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 46071 Section 02.01.a - one sample
- IP 46071 Section 02.01.b - one sample
- IP 46071 Section 02.01.c - one sample
- IP 50090 Section 02.01.f - one sample
- IP 50090 Section 02.02.a. - one sample

b. Observations and Findings

No findings of significance were identified.

The inspectors noted that during the general walkdown procedure training neither lessons learned nor operating experiences were discussed. This expectation is addressed in Bechtel's Training Procedure, 25402-MGT-0001, Attachment C, which included an instructor evaluation describing evaluation criteria for the discussion of operating experience. PER 162946 was initiated to address this observation.

c. Conclusions

TVA's program for training of newly hired personnel was adequate for the current level of construction activities being performed.

## III. Operational Readiness Activities

### F.1 Fire Protection (IP 64051)

a. Inspection Scope

The inspectors held discussions with TVA's fire protection engineer regarding fire protection requirements applied to Unit 2 construction activities which were established to prevent an adverse affect of a fire on Unit 1 operations. The inspectors reviewed applicable fire protection procedures, observed several fire suppression and detection devices dedicated for Unit 2 areas inside the reactor building, auxiliary building and turbine building. The inspectors conducted a walkdown of the Unit 2 fire protection/prevention controls that had been established by TVA. Specific documents reviewed are listed in Attachment 1.

The following samples were inspected:

- IP 64051 Sections 02.02 - one sample
- IP 64051 Sections 02.03 - one sample
- IP 64051 Sections 02.04 - one sample
- IP 64051 Sections 02.05 - one sample
- IP 64051 Sections 02.06 - one sample

- IP 64051 Sections 02.07 - twelve samples
- IP 64051 Sections 02.08 - one sample

b. Observations and Findings

No findings of significance were identified.

The inspectors verified that the common $CO_2$ tank had adequate level and pressure indication and that the current values of these measurements were acceptable. The inspectors also observed welding being performed in the Unit 2 auxiliary building and verified that adequate fire protection/prevention provisions were in place for this activity.

c. Conclusions

The work in progress had adequate permits and protection in place to minimize any impact on Unit 1. TVA's fire protection measures in place to support Unit 2 construction activities were also adequate.

## IV. Other Activities

### OA.1 Construction Inspection Program Reconstitution Review

a. Inspection Scope

In 1985, construction on Watts Bar Unit 1 and Watts Bar Unit 2 was stopped due to the identification of multiple construction QA issues. TVA completed Unit 1 in 1995 but had conducted very little Unit 2-specific work since 1985. In 2007, TVA decided to finish the Unit 2 plant. As part of confirming that all issues and inspection requirements will be completed for Unit 2, a review of all NRC inspection reports was initiated to determine the status of the required IPs, contained in NRC Manual Chapter 2512, in effect at the time construction was stopped. This effort was called the reconstitution process. The NRC used the results of the reconstitution process to identify areas which require additional inspections.

To address the multiple construction QA issues identified in 1985, the NRC will inspect the implementation of the TVA Corrective Action Programs (CAP) and Special Programs (SP). In addition, the NRC plans to inspect other areas deemed necessary, based on additional reviews of historical allegations, previous open items, generic issues, and construction deficiency reports. Reconstitution of IPs dealing with TVA's procedures and programs was determined to be unnecessary because these were common for both units and the Unit 1 reconstitution effort documented in NUREG-1528 confirmed adequate reviews were completed. Also, one IP (65051, Low-Level Radioactive Waste Storage) was determined to not be applicable and several IPs were known to cover work not yet completed so these were not considered for reconstitution. New work or activities performed in areas covered by the IPs will be inspected, utilizing all applicable IPs, as part of the rework inspection effort. Specific NRC inspection report numbers credited for each IP during reconstitution reviews and results summaries are listed in Attachment 2.

b. Observations and Findings

The reconstitution reviews identified that many of the inspection requirements specified in IMC 2512 IPs were completed during previously performed NRC inspections of Unit 2 SSCs. Little Unit 2-specific work was accomplished after 1985; however, common systems were completed for Unit 1 operation which could be credited for Unit 2 inspections. Limited credit was given to common systems to assure sufficient Unit 2-specific activities were covered.

c. Conclusions

The reconstitution effort was completed and the status of previously performed inspections as compared to requirements in IMC 2512 IPs was defined from these reviews. The required inspections are shown on Attachment 2.

## V. Management Meetings

### X.1 Exit Meeting Summary

On April 9, 2009, the resident inspectors presented the inspection results to Mr. Masoud Bajestani and other members of his staff. Although some proprietary information may have been reviewed during the inspection, no proprietary information was included in this inspection report.

### X.5 Public Meeting Summary

On April 14, 2009, the NRC's Chief of Construction Projects Branch 3, and the Resident Inspectors, held a Category 3 meeting for members of the public and local officials. This Category 3 public meeting provided an informative presentation to engage the public in a discussion of the NRC's annual assessment of the Watts Bar Nuclear Plant Unit 2 construction project for the period from January 1 through December 31, 2008. The members of the public expressed no concerns about the construction activities at the Watts Bar facility. The presentation material used for discussions (Attachment 4) and the list of attendees (Attachment 5) are attached to this report.

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Applicant personnel

G. Arent, Licensing Manager, Unit 2
J. Atwell, Project Director, Bechtel
M. Bajestani, Vice President, Unit 2
M. Bali, Electrical Design Manager, Bechtel
R. Baron, Nuclear Assurance Project Manager, TVA, Unit 2
B. Briody, Maintenance and Modifications Manager, TVA, Unit 2
P. Byron, Licensing Engineer
B. Crouch, Lead Mechanical Engineer, TVA, Unit 2
R. Esnes, Engineering Manager, Washington Group, Inc
T. Franchuk, Quality Manager, Bechtel
E. Freeman, Engineering Manager, TVA, Unit 2
W. Goodman, Procurement Manager, Bechtel
J. Hannah, Corrective Action Coordinator, Bechtel
S. Hilmes, Lead Electrical Engineer, TVA, Unit 2
M. Lackey, ECP Rep, TVA, Unit 2
R. Kuhn, Quality Assurance Manager, Bechtel
D. Malone, Quality Assurance, TVA, Unit 2
J. McCarthy, Licensing Engineer, Unit 2
R. Moll, Preop Startup Manager, TVA, Unit 2
D. Myers, Quality Assurance Manager, TVA, Unit 2
L. Davenport, Contracts/Procurement Manager, TVA, Unit 2
D. Osborne, Lead Civil Engineer, TVA, Unit 2
J. Robertson, Acting Engineering Manager, Bechtel
S. Sawa, Training Manager, Bechtel
J. Schlessel, Construction Manager, TVA, Unit 2
D. Soberski, Quality Control Supervisor, Bechtel
P. Theobold, Radcon Supervisor, TVA, Unit 2
A. Aldridge, Acting Construction Manager, Bechtel
D. Tinley, Quality Assurance, TVA, Unit 2
D. Webb, Operations Manager, TVA, Unit 2
Z. Rad, Licensing Supervisor, TVA Unit 2
D. Brasswell, Bechtel Civil Superintendent
J. Hanna, Bechtel CAP Coordinator

## INSPECTION PROCEDURES USED

| | |
|---|---|
| IP 35060 | Licensee Management of QA Activities |
| IP 35061 | In-depth QA Inspection of Performance |
| IP 35065 | Procurement, Receiving, and Storage |
| IP 35100 | Review of QA Manual |
| IP 35960 | QA Program Evaluation of Engineering Organization |
| IP 37055 | Onsite Design Activities |
| IP 40504 | Part 52, Identification and Resolution of Construction Problems |
| IP 46071 | Concrete Expansion Anchors |
| IP 49063 | Safety-Related Piping Work Observation |
| IP 49065 | Safety-Related Piping Record Review |
| IP 50051 | Reactor Vessels and Internals QA Review |
| IP 50053 | Reactor Vessel and Internals Work Observation |
| IP 50055 | Reactor Vessel and Internals Record Review |
| IP 50090 | Pipe Support and Restraint Systems |
| IP 51051 | Electrical Components and Systems Procedure Review |
| IP 51053 | Electrical Components and Systems Work Observation |
| IP 51055 | Electrical Components and Systems – Record Review |
| IP 51061 | Electrical Cable – Procedure Review |
| IP 51063 | Electrical Cable Work Observation |
| IP 52051 | Instrument Components and Systems Procedure Review |
| IP 52053 | Instrument Components and Systems Work Observation |
| IP 53053 | Containment Penetrations (Mechanical) Work Observation |
| IP 53055 | Containment Penetrations (Mechanical) Record Review |
| IP 55050 | Nuclear Welding General |
| IP 57060 | Nondestructive Examination - PT |
| IP 57090 | Nondestructive Examination - RT |
| IP 64051 | Procedures - Fire Prevention/Protection |

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

5000391/2009602-01 NCV Failure to follow procedure for scaffold inspections (Section E.1.1)

Closed

None

Discussed

None

## LIST OF DOCUMENTS REVIEWED

### I. Quality Assurance Program

Q.1.1 Licensee Management of QA Activities

Procedures/Programs

WDP-PD-2, Walkdown Procedure for Piping and Pipe Supports, Revision 5
Watts Bar Unit 2 Construction Completion Project Bechtel Project Nuclear Quality Assurance Manual, Rev. 3

PERs

161045, Multiple Errors were Found in the DRAs.
161142, FCRs did not Provide a Calculation and/or Logical Argument Supporting the Trend Code.
162146, Questions Regarding Fire Watch Responsibilities.
162159, Fire Impairment Permits Covering Existing Smoke Detectors During Welding Activities.
162169, Fire protection Foreman Mistakenly Entered and Exited the Fire Protection Operating Requirement Times for FPIP C08-0647 and FPIP C08-0025.

WBN2 Quality Surveillance Reports

25402-WBN-SR-09-00308, Drawing revision authorization (DRA) dated January 15, 2009
25402-WBN-SR-09-00310, Field Change Request (FCR) Monthly Summary Report, December 2008
25402-WBN-SR-09-00311, Field Change Request (FCR) Annual Summary Report, 2008

Q.1.2 In-Depth Inspection of QA Performance

POs

00001827-04188, ASME Section III Class II studs
0004248-00840, ASME 1” pipe cap, 6” 90 degree elbows and 20’ pipe

Procedures

25402-000-GPP-0000-N6204, Field Material Control and Traceability, Rev 4
25402-PRO-0007, Field Material Storage Control, Rev 1
25402-000-GPP-0000-N6104, Materials Receiving, Rev 0

Q.1.3 Review of QA Manual

Procedures/Programs

25402-MGT-0001, Project Procedures, Rev. 5
25402-000-GPP-0000-N3210, Concrete Operations, Rev. 0
25402-000-GPP-0000-N3221, Structural Steel Erection, Rev. 0
25402-000-GPP-0000-N3303, Cable Installation, Rev. 1
25402-000-GPP-0000-N3304, Cable Terminations, Rev. 0

25402-000-GPP-0000-N3401, Instrument and Instrument Line Installation, Rev. 0
25402-000-GPP-0000-N3506, Pressure Testing of Piping, Tubing and Components, Rev. 1
25402-3DP-G00G-00001-028, Project Engineering Procedures Manual Master Index, dated February 17, 2009
25402-000-GPP-0000-N6102, Field Material Requisitions and Purchasing, Rev 5
SPP-6.4, Measuring and Test Equipment, Rev 4
25402-000-GPP-0000-N7102, Control of Measuring and Test Equipment, Rev 1

Q.1.4 Identification and Resolution of Construction Problems

Procedures/Programs

25402-MGT-0007, Self Assessment Program, Rev. 0
25402-MGT-000, Corrective Action Program, Rev. 2

Oversight/Self-Assessment Documents

Problem Evaluation Report (PER) 138182, Potential Engineering Training Weaknesses
PER 139939, Potential weaknesses and Inconsistencies in Engineering Training
PER 157026, Material Receipt Inspection Procedure Violation
PER 158285, QC Records Improperly Completed
Audit No. 25402-WBN-AR-08-0005, Quality Control Activities, dated November 3-18, 2008
NA-WB-08-021; Nuclear Assurance Oversight Report for the Period of November to December, 2008
Project Quality Activity Summary Report November 2008
Project Quality Activity Summary Report December 2008
Project Quality Activity Summary Report January 2008

Bechtel Oversight/Self-Assessment Documents

NA-WB-09-001, Bechtel QA Walkdown of Bulletin 79-14 Pipe Supports, January 2009

Q.1.5 Safety Conscious Work Environment

25402-MGT-000, Corrective Action Program, Rev. 2

**II. Management Oversight and Controls**

C.1.1 Walkdowns

Procedures and Standards

WDP-PD-2, Walkdown Procedure for Piping and Pipe Supports, Rev. 5

C.1.2 Protection of Installed Equipment during Construction Activities

Procedures and Standards

25402-000-GPP-0000-N2102, Housekeeping, Rev 2

PERs

162389, Containment Reactor Vessel Enclosure Sign
163541, Untimely Response to NRC issues

C.1.3 Electrical Penetrations

Procedures and Standards

MAI-2.2, Mechanical Penetration Seals, Rev. 5
MAI-3.6, Cable Tray and Sleeve Seals, Rev. 7
25402-000-GPP-0000-N3224, Penetration Closure and Seals, Rev 0

PERs

152573, ASME Section III (Personnel Air Lock)
163249, Penetration A12424

C.1.4 Safety-Related Piping Work Observation

Procedures and Standards

25402-000-GPP-0000-N3503, Piping Installation, Rev. 2

Calculations

EDCR 52612, Replace 6” Schedule 40 TVA Class B pipe near penetration 47A

C.1.5 Radiograph Film Interpretation of Safety-Related Welds

Procedures and Standards

25402-000-4MP-T040-S0126, Radiographic Examination, RT – ASME/ANSI Piping

C.1.6 Liquid Penetrant Examination of Safety-Related Welds

Procedures and Standards

25402-000-4MP-T040-S0125, Liquid Penetrant Examination, PT (SR) - ASME

PERs

152573, Unintended Partial Removal of Base Material from Two Attachment Welds

**E.1 Engineering Activities**

E.1.1 Engineering Design Activities and Control

Procedures

25402-3DP-G04G-00503, Master Equipment List, Rev. 1

25402-3DP-G04G-00027, Design Verification, Rev. 1
25402-3DP-G04G-00037, Design Calculations, Rev. 3
25402-3DP-G04G-00046, Engineering Drawings, Rev. 3
25402-3DP-G04G-00049, Engineering Specifications, Rev. 0
25402-3DP-G04G-00050, ASME III Design Specifications, Rev. 0
MMTP-102, Erection of Scaffold/Temporary Work Platforms and Ladders, Rev. 1
SPP-9.3, Plant Modifications and Engineering Change Control, Rev. 17
Post maintenance test instruction (PMTI)-52283-01, Modified ABSCE Boundary Test, Rev. 01

Specifications and Design Criteria Documents

WBNP-DS-501433-0201, Check and Isolation Valves for the Essential Raw Cooling Water System, Rev. 4
WBNP-DS-501433-0704, ¾ inch Globe Valves for the Safety Injection System Rev. 2
DCD WB-DC-40-31.9, Criteria for Design of Piping Supports and Supplemental Steel in Category I Structures, Rev. 21
DCD WB-DC-40-31.7, Analysis of Category I and I(L) Piping Systems, Rev. 23

Calculations

EDQ00299920080001, Unit 2 V5 Cable Ampacity, Rev. 0
WMG1115D, ICS Operational Modes Problem N3-61-A03R & A08R, Rev. 4
N36109R, Summary of Piping Analysis Problem No. N3-61-09R, Rev. 0
247A46211135, Qualification of Pipe Support Nos. 2-47A462-11-135, Rev 0
247A06061027, Qualification of Pipe Support No 2-47A060-61-27, Rev 0
DCN 52283, ABSCE Modification

Drawings

2-47W600-105, Electrical Instruments and Controls, Rev. 1
47W450 Series, Piping Bill of Material, Rev.1
47W406 Series, CVCS, Rev. 1
47A2053-8, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8A, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8B, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8C, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8D, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8E, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8F, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0
47A2053-8G, Mechanical Category I Support Process Pipe 2” and Less, Rev. 0

PERs

164596, Procedure 25402-000-GPP-0000-N1206 does not provide adequate direction for personnel on work orders involving equipment with unverified MEL data
160995, Procedure issued with a reference that is not issued
164295, Completeness of Submittal for refurbishment Program Document

E.1.2 Procurement Activities

Procedures

TVA Nuclear Quality Assurance Plan, TVA-NQA-PLN89-A, Rev. 18
Bechtel Watts Bar Unit 2 Project Nuclear Quality Assurance Manual, Rev. 3
Bechtel Housekeeping Procedure 25402-000-GPP-0000-N-2102, Rev. 1
ANSI N45.2.2-1978, Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Plants
SPP-4.2, Material Receipt and Inspection, Rev. 20
SPP-4.3, Material Storage and Handling, Rev. 6

25402-3DP-G06G-00001, Material Requisitions, Rev. 1
25402-3DP-G06G-00010, Specifying and Evaluating Supplier Quality Management System or Quality Assurance Program Requirements, Rev. 2
25402-3DP-G06G-00502, Commercial Grade Dedication, Rev. 0
NEDP-5, Design Document Reviews, Rev. 2
NEDP-8, Technical Evaluation for Procurement of Materials and Services, Rev. 13

POs

00035218, Hilti Anchor bolts, Revision 0
00029447, Henry Pratt Co. ASME Sec III, Class 3 Butterfly valve, Revision 0
00058828, NLI Meter, Revision 001
00071752, Drillco Anchor Bolts, Revision 0
00073725, Energy & Process Corp., ASME Sec III, Class 2 studs and nuts, Revision 0
25402-011-FC4-C000-00001, Subcontract to Facility Risk Consultants, inc. to perform seismic work
00001827-04188, ASME Section III Class II studs
0004248-00840, ASME 1” pipe cap, 6” 90 degree elbows and 20’ pipe

Procurement Data Sheets / Evaluations and Test Reports

CAQ965R, Drillco Anchor Bolts, Revision 3
CNX789F, ASME Sec III, Class 2 studs, Revision 1
CPA434H, ASME Sec III, Class 2 nuts, Revision 0
CDP380A, ASME Sec III, Class 2 bolts and nuts
CDP381W, ASME Sec III, Class 2 studs and nuts
CNY354E, Ferraz Shawmut fuses
CNN670Q, Flowserve Corp, ASME Sec III, Class 3 auxiliary feedwater pump
WBCP063, Leslie Controls, Non-ASME valve and actuator parts dedication
CEW199V, Heinemann Electric Co., dedication of molded case circuit breakers
CEW199V-TR, Heinemann Electric Co., test report for molded case circuit breakers
G5925-2-213, Technical Evaluation for molded case circuit breakers.

PERs

166005, Control of transitioning between Bechtel and TVA procedures for Commercial Grade Dedication, Design Verification, and Counterfeit Parts.
163958, Quality Related Material was procured from an unapproved vendor
163870, Issue of ASME III PO to supplier's address not listed in ESL

**T.1 Training and Qualification of Plant Personnel**

T.1.1 Craft Training

WDP-GEN-1, Walkdown Procedure for General Walkdown Requirements, Rev. 11
25402-000-GPP-0000-N3212, Drilled-In Anchors and Core Drilling Operations, Rev. 0
MAI-5.1E, Expansion Shell Anchors Installation, Rev. 9
25402-MGT-0001, Training, Rev. 4

**III. Operational Readiness Activities**

F.1 Fire Protection

Procedures

SPP-10.9, Control of Fire Protection Impairments, Rev. 2
SPP-10.11, Control of Ignition Sources (Hot Work), Rev. 3
SPP-10.10, Control of Transient Combustibles, Rev. 4

## RECONSTITUTION RESULTS

1. 45053, Geotechnical/Foundation Activities work Observation

   The purpose of this IP was to observe work on the ultimate heat sink and material supporting seismic category 1 structures (other than containment and activities covered via IP 46053). This IP includes subgrade preparation, fill materials and compaction control, embankments, dewatering system, piers and pilings, concrete foundations, testing laboratory, instrumentation and monitoring system, and personnel interviews.

   Portions of the following reports were credited for this inspection activity:

   Docket 50- 391: 73-03, 75-06, 76-08, 76-10, 76-11, 77-04, 77-12, 81-25, 82-13, 83-09, 83-19, 83-29, 83-30, 83-35, 83-37, 83-43, 84-13, 84-14, 84-31, 84-40, 84-44, and 95-53

   Results Summary: No additional inspections were deemed to be required. Documentation of some activities was missing, however a 1995 expert NRC team confirmed that no degradation had occurred and, in addition, no significant degradation has occurred to date. Also, structures covered by this IP are common and reconstitution of Unit 1 was considered acceptable previously.

2. 45055, Geotechnical/Foundation Activities Record Review

   The purpose of this IP was to review documentation of activities described in IP 45053 and some additional activities such as corrective action documents, training, and audits. This IP includes receipt inspection and material certification, installation inspection, nonconformance/deviation records, training/qualification records, and QA audits.

   Portions of the following reports were credited for this inspection activity:

   Docket 50-391: 74-02, 75-06, 76-11, 77-04, 77-12, 81-20, 81-25, 82-13, 83-09, 83-30, 84-13, 84-40, 84-44, 93-86, and 95-46

   Results Summary: Requirements of the IP were met. Limited inspections were noted in some areas, however a 1995 expert NRC team confirmed that no degradation had occurred and, in addition, no significant degradation has occurred to date. Also, structures covered by this IP are common and reconstitution of Unit 1 was considered acceptable previously.

3. 46053, Structural Concrete Work Observation

   The purpose of this IP was to confirm concrete placements were properly performed and the on site test laboratory met requirements. This IP includes rebar and embedment placement, rebar splices, liner plate erection and fabrication, concrete batching and delivery, placement, in-process testing, curing, interviews, acceptance, personnel qualification, evaluation of test results, observation of testing, calibration, and special considerations such as hot and cold weather, concrete pumping, and large placements.

   Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-03, 74-01, 74-02, 74-04, 74-05, 74-06, 75-03, 75-04, 75-06, 76-02, 76-05, 76-06, 76-07, 76-08, 76-10, 76-11, 77-02, 77-04, 77-06, 77-07, 77-09, 77-12, 77-16, 78-01, 78-23, 79-03, 79-15, 83-09, 83-16, 83-30, 84-13, 87-03, and 87-04

Results Summary: Requirements of the IP were met. Samples exceeded those required except for observations of the laboratory. This section was considered satisfactory based on records reviews documented under IP 46055. By July of 1983, 98% of concrete had been placed at Watts Bar. In addition, the Concrete Quality Special Program addresses this area and will be inspected.

4. 46055, Structural Concrete Record Review

The purpose of this IP was to review documentation for concrete placements and additional associated records. This IP includes receipt inspection and material certification, installation inspections, nonconformance/deviation records, training/qualification records, and QA audits.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-03, 74-01, 74-02, 74-04, 74-05, 75-03, 75-04, 75-06, 76-02, 76-11, 77-04, 77-07, 77-12, 77-15, 78-05, 83-09, 83-19, 84-31, 87-11, 90-26, and 93-86

Docket 50-390: 90-24

Results Summary: Requirements of the IP were met.

5. 46061, Structural Masonry Construction

The purpose of this IP was to confirm commitments were met for surveillances, inspections, and actions required by IE Bulletin 80-11. This IP includes control of specific materials, control of specific processes, review of as-built portions, review of records, and review of nonconformance reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 83-07, 85-08, 90-26, 91-03, 92-21, 93-01, 93-48, 93-69, and 95-46

Docket 50-390: 89-02, 89-200

Also credited was Calculation Audit dated 1/31/1992 (TAC R00514)

Results Summary: Requirements of the IP were met for common walls. Unit 2 specific walls require inspection to confirm commitments were met.

6. 46071, Concrete Expansion Anchors

The purpose of this IP was to confirm concrete expansion anchors were properly installed and commitments were met for IE Bulletin 79-02. This IP includes control of specific materials, control of specific processes and activities, and review of as-built portions.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 79-18, 79-32, 80-08, 81-06, 81-09, 81-22, 82-08, 82-12, 82-38, 83-01, 83-02, 83-37, 84-05, 84-29, 85-42, 89-200, 90-15, 90-20, 90-24, 92-21, 93-01, 93-78, 94-22, 94-82, 95-06, and 95-72

Results Summary: Inspection requirements were not fully met. It was not clear in a number of reports how much credit was appropriate and sometimes which Unit, therefore, samples were conservatively credited for Unit 2, i.e. most were assigned to Unit 1. Minimal inspection was noted for Section 02.02 (Observation of Work) and only approximately 100 bolts could be credited for Section 02.03 (Review of As-Built Portions). This IP Section 02.02 should be performed for Unit 2 for 172 bolts minimum and Section 02.03 should be performed for 100 bolts minimum. This inspection can be conducted in conjunction with Bulletin 79-02 corrective action via walkdowns, field testing, and record reviews. Pull tests should be credited for torque confirmation.

7. 48053, Structural Steel and Supports Work Observation

The purpose of this IP was to verify, by observation of work activities, that structural steel and support activities were accomplished in accordance requirements. This IP includes receipt inspection and storage of materials; use of specified materials and components; installation and erection during various stages of work; inspection; testing; nondestructive examination; adequacy of records development; and verification that craft and inspection personnel were knowledgeable of the work activities they performed.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 74-07, 75-04, 75-06, 76-02, 76-06, 76-07, 76-08, 77-05, 77-07, 77-15, 78-01, 78-04, 78-05, 78-09, 78-11, 78-14, 78-18, 78-21, 79-02, 79-07, 82-04, 83-04, 86-13, 87-03, 89-200, 93-34, 93-53, 94-09, 94-13, and 95-53.

Results Summary: Requirements of the IP were met. Receiving inspection of structural materials outside containment was credited using IP 48055 inspections. Although some documentation was minimal, full credit was not given for these items and many extra samples were completed.

8. 48055, Structural Steel and Supports Record Review

The purpose of this IP was to confirm documentation met requirements for approximately half of the activities described in IP 48053 and some additional activities such as corrective action documents, training, and audits. This IP includes receipt inspection and material certification, installation inspections, nonconformance/deviation records, training/qualification records, and QA audits.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-06, 76-02, 76-06, 76-07, 76-08, 77-03, 77-07, 77-15, 78-04, 78-05, 78-11, 78-14, 78-18, 79-03, 79-19, 79-22, 82-04, 82-14, 83-04, 90-04, 92-02, 92-21, 92-29, and 94-09

Results Summary: Requirements of the IP were met.

9. 49053, Reactor Coolant Pressure Boundary Piping Work Observation

The purpose of this IP was to verify, by observation of various installation activities and record review, that requirements were met for Class 1 piping. This IP includes handling, protection, installation, cutting, grinding, bending, supporting, cleaning and flushing, quality related inspections, inspector qualification, heat treatment, control of nonconforming items, as-built confirmation, and record keeping, as applicable.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 76-07, 77-03, 77-15, 78-02, 78-14, 78-26, 78-27, 79-02, 79-03, 79-05, 79-07, 79-19, 79-41, 80-01, 85-37, 85-41, and 86-09

Results Summary: Requirements of the IP were met.

10. 49055, Reactor Coolant Pressure Boundary Piping Record Review

The purpose of this IP was to confirm documentation met requirements for Class 1 piping. This IP includes receipt inspection and material certification, installation inspections, nonconformance reports, craft and inspector qualification, and audit reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 76-07, 76-10, 77-03, 78-02, 78-14, 78-25, 78-27, 81-15, and 86-09

Results Summary: Requirements of the IP were met.

11. 49063, Piping Work Observation

The purpose of this IP was to verify, by observation of various installation activities and record review, that requirements were met for piping, other than reactor coolant pressure boundary piping. This IP includes handling, protection, installation, cutting, grinding, bending, supporting, cleaning and flushing, quality related inspections, inspector qualification, heat treatment, hydrostatic testing, control of nonconforming items, as-built confirmation, and record keeping, as applicable.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-10, 76-02, 78-02, 78-07, 78-21, 78-25, 78-26, 79-02, 79-05, 79-19, 79-22, 79-25, 79-31, 79-36, 79-38, 80-05, 80-09, 80-11, 80-15, 80-17, 80-22, 80-25, 81-15, 81-19, 82-21, 82-24, 82-27, 82-35, 83-35, 84-23, 84-31, 84-53, and 87-19

Results Summary: Requirements of the IP were met.

12. 49065, Safety-Related Piping Records Review

The purpose of this IP was to confirm documentation met requirements for piping, other than reactor coolant pressure boundary piping. This IP includes nonconformance reports, craft and inspector qualification, and audit reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 78-21, 78-25, 79-05, 79-19, 79-29, 79-39, 80-05, 80-09, 80-15, 81-19, 82-24, and 82-35

Results Summary: Requirements of the IP were met.

13. 50053, Reactor Vessel and Internals work Observation

The purpose of this IP was to confirm adequate installation and storage of the reactor vessel and reactor vessel internals. This IP includes storage protection, protection of installed components, and installation techniques.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-03, 76-05, 76-11, 77-17, 78-06, 78-07, 78-20, 79-01, 79-05, 79-11, 79-19, and 86-20

Results Summary: Requirements of the IP were met. However, long dormancy and newly established storage/protection conditions require additional inspection. Perform Sections 02.03.b, Installed Vessel Protection and 02.03.d, Installed Vessel Internals Protection.

14. 50055, Reactor Vessel and Internals Record Review

The purpose of this IP was to confirm records associated with the reactor vessel and reactor vessel internals met requirements. This IP includes receipt inspection and material certification, storage and installation inspections, nonconformance/deviation records, personnel qualification records, and QA audits.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-03, 76-05, 76-11, 77-14, 78-06, and 79-11

Results Summary: Requirements of the IP were met. However, long dormancy and newly established storage/protection conditions require additional inspection. Perform Section 02.02.b, Storage and Installation Inspections except for the vessel installation. Also perform Section 02.02.c, Nonconformance/Deviation Records if available.

15. 50073, Mechanical Components Work Observation

The purpose of this IP was to confirm requirements were met for various components including 14 reactor coolant pressure boundary components, 10 other safety-related components to include two motor operated valves. This IP includes receipt inspection, storage, handling, protection, installation, protection and maintenance after installation, personnel interviews, and as-built confirmation.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-04, 75-11, 76-05, 76-06, 76-07, 76-08, 76-09, 76-10, 76-11, 77-07, 77-16, 77-17, 78-06, 78-07, 78-12, 78-20, 78-27, 79-25, 87-19, and 87-20

Docket 50-390: 89-200

Results Summary: Inspection requirements were not fully met. Perform Section 02.02.b, Storage, Handling, and Protection for four safety-related components and two motor operated valves minimum. Also perform Section 02.04, As-Built Inspections for 12 components minimum.

16. 50075, Safety-Related Components Records Review

The purpose of this IP was to confirm records, associated with safety-related components, met requirements. This IP includes audits, installation, inspection, receipt inspection, nonconformance/deviation reports, storage inspection, and personnel qualification.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 75-04, 76-05, 76-06, 76-07, 76-08, 76-11, 77-07, 77-16, 78-06, 78-12, 78-09, 78-20, 78-27, 79-03, 79-15, 82-24, 83-42, 87-19

Results Summary: Inspection requirements were not fully met. Perform Section 02.03.c, Storage Inspection for four reactor coolant pressure boundary components and two motor operated valves minimum.

17. 50090, Pipe Support and Restraint Systems Review

The purpose of this IP was to confirm adequate installation of pipe supports and restraints through procedure reviews, observation of work, and record reviews. This IP includes review of QA and work procedures, personnel interviews, observation of work activities, review of installation records, nonconformance reports, personnel qualifications, and audit reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 78-07, 79-22, 79-24, 79-32, 80-01, 80-05, 81-04, 82-08, 82-27, 82-22, 83-07, 83-20, 83-35, 83-37, 84-01, 84-12, 84-48, 84-53, 85-04, 85-16, 85-20, 85-46, 85-48, 85-53, 86-14, 87-03, and 87-13

Results Summary: Inspection requirements were not fully met. Perform Sections 02.03.b, c, d, e, and f for 54 samples minimum covering each type of support listed. This IP should be performed with follow-up for NRC Bulletin 79-14.

18. 50100, HVAC Systems Review

The purpose of this IP was to confirm adequate installation of HVAC systems through procedure reviews, observation of work, and record reviews. This IP includes review of QA and work procedures, personnel interviews, observation of work activities, as-installed equipment review, review of installation records, nonconformance reports, and audit reports.

Portions of he following reports were credited for this inspection activity:

Docket 50-391: 81-05, 81-24, 82-03, 82-28, 83-07, 83-24, 83-37, 85-42, 87-07, 87-17, 91-14, 91-26, 92-13, 93-42, 93-78, 93-87, 94-08, 94-09, 94-89, and 95-38

Results Summary: Requirements of the IP were met.

19. 51053, Electrical Components and Systems Work Observation

The purpose of this IP was to confirm adequate installation of raceway systems; emergency diesel generators; DC systems; distribution, control, and protective apparatus; and other electrical components. This IP includes receiving inspection, storage, handling, in-process installation, completed work, as-built verification, and construction testing.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 77-08, 77-13, 77-16, 78-08, 78-13, 78-22, 78-25, 78-26, 78-27, 79-03, 79-05, 79-11, 79-12, 79-15, 79-16, 79-19, 79-20, 79-22, 79-23, 79-28, 79-33, 79-36, 82-35, 83-44, 84-23, 84-39, 84-56, 85-30, 85-53, 86-02, 86-13, 87-10, 87-14, 87-19, 89-07, 89-22, 89-200, 92-40, and 94-25.

Results Summary: Inspection requirements were not fully met. While minimum sample sizes were met, some semi-annual inspections were not met. Further inspections are warranted. Perform Section 02.01.b, Raceway Systems (2.02.a and 2.02.b portions); Section 2.01.e, Distribution, Control, and protective Apparatus (2.02.e, f, and g portions); and Section 2.02.f, Other Electrical Components (2.02.f portion).

20. 51055, Electrical Components and Systems Records Review

The purpose of this IP was to confirm records requirements were met for electrical components. This IP includes receiving inspection, storage, installation, construction testing, personnel qualification, nonconformance and deviation reports, change control, and audits.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 77-08, 77-13, 77-16, 78-08, 78-13, 78-22, 78-25, 78-27, 79-05, 79-12, 79-17, 79-25, 79-33, 82-02, 82-24, 84-84, 86-21, 87-17, and 89-200

Results Summary: Inspection requirements were met except for one section. Perform Section 02.05, Change Control Records.

21. 51063, Electrical Cable Work Observation

The purpose of this IP was to confirm activities related to installation met requirements for various types of electrical cable and associated material. This IP includes receiving inspection, storage, in-process installation, completed work inspection, as-built verification, cable testing, and raceway loading.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 78-22, 78-27, 79-03, 79-05, 79-07, 79-12, 79-15, 79-16, 79-19, 79-20, 79-22, 79-28, 79-33, 79-35, 80-06, 81-05, 82-20, 82-31, 82-33, 84-61, 85-20, 85-32, 85-50, 86-11, and 86-24

Results Summary: Inspection requirements were not fully met. Perform Section 02.01.d, In-Process Installation sample (02.02.c) for four power cable terminations involving stress cone. Perform Section 02.02, Raceway Loading for one Division B power cable tray.

22. 51065, Electrical Cable Record Review

The purpose of this IP was to confirm records for cable, terminations, and associated items met requirements. This IP includes receiving inspection, storage, installation, cable testing, raceway loading, personnel qualification, nonconformance and deviation reports, change control records, and audit reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 78-22, 79-07, 79-12, 79-16, 79-20, 79-23, 79-35, 79-40, 80-06, 82-31, 86-05, 86-08, 86-24, 87-14, 91-12, and 93-01

Results Summary: Inspection requirements were not fully met. Perform Sections 02.02.d, Cable Testing Records for 13 cables minimum; 02.03, Raceway Loading for 10 cable trays and eight conduits minimum; 02.04, Personnel Qualification Records; and 02.06, Change Control Records.

23. 52053, Instrument Components and Systems Work Observation

The purpose of this IP was to confirm adequate installation of instrumentation and associated components for reactor trip system, engineered safety features actuation system, safety-related display information, and instrument air system. This IP includes receiving inspection, storage, in-process installation, completed work, as-built verification, and construction testing.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 79-17, 80-03, 80-18, 81-10, 82-12, and 85-32

Results Summary: Inspection requirements were not met. Only minimal samples were noted for only two sections of the IP. This IP should be performed in its entirety. It is noted that the applicant plans to rework or replace most instrumentation.

24. 52055, Instrument Components and Systems Record Review

The purpose of this IP was to confirm records for instrumentation and associated components for the reactor trip system, engineered safety features actuation system, and two other instrument systems important to safety met requirements. This IP includes receiving inspection, storage, installation, construction testing, calibration, personnel qualification, nonconformance and deviation reports, change control records, and audit reports.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 79-17, 79-29, 80-03, 85-32, and 87-19

Results Summary: Inspection requirements were not met. Only minimal samples were noted. This IP should be performed in its entirety. It is noted that the applicant plans to rework or replace most instrumentation.

25. 53053, Containment Penetrations (Mechanical) Work Observation

The purpose of this IP was to confirm adequate installation of mechanical penetrations. This IP includes material certification, method of assemble, protection, installation activities, nondestructive examination, and inspection as well as a semi-annual requirement to observe installation and confirm adequacy of documents used for installation.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 79-11, 81-19, and 85-36

Results Summary: Inspection requirements were not met. Only minimal samples were noted. Perform inspection requirements for three piping penetrations minimum.

26. 53055, Containment Penetrations (Mechanical) Record Review

The purpose of this IP was to confirm records for mechanical penetrations met requirements. This IP includes receipt inspection, material certification, installation and testing inspections, nonconformance/deviation records, personnel qualification, and audits.

No reports were credited for this inspection activity.

Results Summary: Inspection requirements were not met. No samples were noted. Perform all Sections of this IP.

27. 55050, Nuclear Welding General Inspection

The purpose of this IP was to confirm ASME welding was accomplished in accordance with Code and other requirements. This IP includes base material/filler material compatibility, welding procedures, welder qualification, in-process welding, preheat and post weld heat treatment, weld examination, and nondestructive examination procedures.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 76-06, 76-11, 77-07, 78-02, 78-04, 78-11, 78-14, 78-20, 78-21, 78-25, 78-38, 79-02, 79-03, 79-05, 79-07, 79-09, 79-15, 79-19, 79-38, 80-01, 80-10, 80-13, 81-12, 81-15, 81-19, 82-17, 84-53, 84-56, 85-36, 85-41, 85-42, 85-45, 85-51, 85-52, 85-53, 87-19, and 88-05

Results Summary: Requirements of this IP were met.

28. 55100, Structural Welding General Inspection

The purpose of this IP was to confirm non-ASME welding was accomplished in accordance with Code and other requirements. This IP includes base material/filler material compatibility, welding procedures, welder qualification, in-process welding, preheat and post weld heat treatment, weld examination, nondestructive examination procedures, and inspector certification.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 78-04, 79-02, 79-14, 82-17, 84-53, 85-52, 86-20, 87-19, and 90-04

Results Summary: Requirements of this IP were not met for observations of production welding. Perform Section 02.04 for a minimum of 28 welds.

29. 57050, Nondestructive Examination Visual (VT) Examination Procedure

The purpose of this IP was to confirm visual inspections were accomplished in accordance with requirements. This IP includes procedure review, work observation, and record reviews.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 74-02, 76-06, 76-08, 77-07, 78-02, 78-11, 79-11, 81-12, 81-15, 82-17, 83-04, 84-53, 84-56, 85-20, 85-41, 88-05, 90-15, 90-16, and 95-70.

Results Summary: Requirements of this IP were met.

30. 57060, Nondestructive Examination Liquid Penetrant (PT) Examination Procedure

The purpose of this IP was to confirm liquid penetrant inspections were accomplished in accordance with requirements. This IP includes procedure review, work observation, and record reviews.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-02, 76-06, 76-08, 78-04, 79-13, 79-21, 79-38, 80-02, 80-10, 80-13, 84-35, 84-53, 85-20, 85-36, 90-15, 90-16, and 95-70.

Results Summary: Requirements of this IP were met, however, minimal field observations were credited. This IP should be implemented for new work with a goal of additional field observations samples.

31. 57070, Nondestructive Examination Magnetic Particle (MT) Examination Procedure

The purpose of this IP was to confirm magnetic particle inspections were accomplished in accordance with requirements. This IP includes procedure review, work observation, and record reviews.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-01, 74-02, 77-03, 77-07, 78-09, and 90-16

Results Summary: It is not clear whether this procedure was met, however, this was a new procedure when most work had been completed on Watts Bar (these requirements were previously covered with welding IPs). No field observations were noted but no minimum sample was specified. Little value would be obtained with record reviews. This procedure should be implemented if new work is available.

32. 57080, Nondestructive Examination Ultrasonic Testing (UT) Examination Procedure

The purpose of this IP was to confirm ultrasonic testing inspections were accomplished in accordance with requirements. This IP includes procedure review, work observation, and record reviews.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-01, 77-03, 77-15, 78-20, 79-13, 80-10, 84-35, 90-15, 90-18, and 95-70

Results Summary: Minimal documentation was noted for some attributes, however, UT was not the typical method for construction weld volumetric exams and this IP was issued after most welding was completed on Watts Bar. This IP should be implemented with IP 73053 if UT is performed for Preservice baseline inspections.

33. 57090, Nondestructive Examination Radiographic (RT) Examination Procedure

The purpose of this IP was to confirm radiographic testing was accomplished in accordance with requirements. This IP includes procedure review, work observation, and record reviews.

Portions of the following reports were credited for this inspection activity:

Docket 50-391: 73-01, 74-02, 76-06, 78-02, 78-11, 80-07, 80-13, 81-04, 81-15, 81-19, 84-35, 86-09, 87-19, 89-04, 90-15, and 90-16

Results Summary: Inspection requirements were met for this IP. Minimal documentation was noted for some attributes, however, this was a new procedure when most work had been completed on Watts Bar (these requirements were previously covered with welding IPs). This procedure should be implemented if new work is available.

34. 63050, Containment Structural Integrity Test

The purpose of this IP was to confirm that the structural integrity test was performed in accordance with requirements. This IP includes procedure review, test witnessing, and review of test records.

No reports were credited for this inspection activity.

Results Summary: Requirements of this IP were not met. Perform this IP in its entirety.

IP Status Summary Table
Readiness Inspection Only

| IP Section | Inspection Report (s) | Status |
|---|---|---|
| 35060, Licensee Management of QA Activities | | |
| 02.01 Inspection Planning | | N/A |
| **02.02 Quality Assurance Program**<br>02.02 a. QA Program Changes | 2008006<br>2009602 | Complete |
| 02.02 b. Licensee reviews of QA program effectiveness | 2008006<br>2008009<br>2008010 | Complete |
| 02.02 c. Corporate QA – Site QA interface | 2008006<br>2008009<br>2008010 | Complete |
| **02.03 Design**<br>02.03 a. Design - Licensee Acting as Own A/E | | N/A |
| 02.03 b. Design - External A/E (Designer) | 2008006<br>2008009<br>2008010<br>2009602 | Complete |
| **02.04 Procurement**<br>02.04 a. QA Responsibilities | 2008006<br>2009602 | Complete |
| 02.04 b. Procurement Action Review | 2008006<br>2008009<br>2009602 | Complete |
| 02.04 c. Supplier Control | | N/A |
| 02.04 d. Corporate/Site Procurement Interface | 2008006<br>2009602 | Complete |
| **02.05 Audits**<br>02.05 a. Audit Program | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.05 b. Audit Reviews | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 35061, In-Depth QA Inspection of Performance | | |
| 02.01 a. Field Drawings and Work Procedures | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 b. Field Inspection | 2008006<br>2008007 | Complete |

| IP Section | Inspection Report (s) | Status |
|---|---|---|
| | 2008009<br>2008010 | |
| 02.01 c. Field Engineer / Engineering Reports | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 d. Quality Control | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 e. Nonconforming Reports | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 f. Materials and Equipment | 2008006<br>2008010<br>2009602 | Complete |
| 02.01 g. Audits | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.02 Procedures and implementation of Part 21 | 2008006<br>2008009 | Complete |
| 35065 Procurement, Receiving, and Storage | | |
| **02.01 Site Procurement**<br>02.01 a. Licensee Activities | 2008006<br>2008010 | Complete |
| 02.01 b. Site Procurement Activities and Records | 2008006<br>2008009<br>2008010 | Complete |
| **02.02 Receiving Inspection**<br>02.02 a. Review system for conducting receipt | 2008006<br>2008010 | Complete |
| 02.02 b. Review receipt inspection records for QA oversight | 2008006<br>2008010 | Complete |
| 02.02 c. Review receipt inspection records for compliance w/ acceptance requirements | 2008006<br>2008010 | Complete |
| 02.02 d. Review requirements specified in procurement document… | 2008006<br>2008010 | Complete |
| 02.02 e. Adequacy of procurement documents | 2008006<br>2008010 | Complete |
| 02.02 f. Adequacy of Certificate of Conformance documentations | 2008006<br>2008010 | Complete |
| 02.02 g. Source verification requirements | 2008006<br>2009602 | Complete |

| IP Section | Inspection Report (s) | Status |
|---|---|---|
| 02.02 h. Independent Verification | 2008006<br>2008007<br>2008009<br>2008010<br>2009602 | Complete |
| 02.02 i. Verify non-conforming items tagged and segregated | 2008006<br>2009602 | Complete |
| **02.03 Storage**<br>02.03 a. Review work and QA/QC procedures | 2008006<br>2008010 | Complete |
| 02.03 b. Inspect facilities | 2008006<br>2008010 | Complete |
| 02.03 c. Adequacy of Storage conditions | 2008006<br>2008010 | Complete |
| 02.03 d. Review equipment storage records | 2008006<br>2008010 | Complete |
| **02.04 Inplace Storage**<br>02.04 a. Review work and QA/QC procedures | 2008006 | Complete |
| 02.04 b. Equipment protection from construction activities | 2008006 | Complete |
| 02.04 c. Requirements such as dessicants, heaters, rotation | 2008006 | Complete |
| 02.04 d. Periodic inspections implemented and verify records | 2008006 | Complete |
| 02.04 e. Any specified special storage requirements are met | 2008006 | Complete |
| **02.05 Inplant Storage**<br>02.05 a. Verify storage requirements met | 2008006<br>2008009 | Complete |
| 02.05 b. Verify acceptability of storage conditions | 2008006<br>2008009 | Complete |
| 35100, Review of QA Manual | | |
| 02.01 Organizational Structure and QA Personnel | 2008006 | Complete |
| 02.02 Audits | 2008006 | Complete |
| 02.03 Quality Requirements | 2008006<br>2009602 | Complete |
| 02.04 Work and Quality Inspection Procedures | 2008006 | Complete |
| 02.05 Control of Material | 2008006 | Complete |
| 02.06 Control of Processes | 2008006 | Complete |

| IP Section | Inspection Report (s) | Status |
|---|---|---|
| 02.07 Corrective Action | 2008006 | Complete |
| 02.08 Document Control | 2008006 | Complete |
| 02.09 Test Control and Control of Test Equipment | 2008006<br>2009602 | Complete |
| 02.10 Quality Records | 2008006 | Complete |
| 02.11 Onsite Design Controls | 2008006<br>2008009<br>2008010<br>2009602 | Complete |
| 35960, QA Program Evaluation of Engineering Organization | | |
| 02.01 QA Program | 2008006<br>2008007<br>2008009<br>2008010<br>2009602 | Complete |
| 02.02 Organization | 2008006 | Complete |
| 02.03 Engineering Control | 2008006<br>2008009<br>2008010<br>2009602 | Complete |
| 02.04 Procurement Control | 2008006<br>2008009<br>2008010<br>2009602 | Complete |
| 02.05 Quality Assurance Records | 2008006 | Complete |
| 02.06 Audits | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 37055, Onsite Design Activities | | |
| 02.01 Functional Responsibilities for Onsite Design | | N/A |
| 02.02 Design Procedure Review | 2009602 | Complete |
| 02.03 Design Process Review<br>02.03 a. New Design/Field Fabrication | 2009602 | Complete |
| 02.03 b. Design Changes | 2008009<br>2008010<br>2009602 | Complete |
| 02.03 c. Control of Drawings | 2008009<br>2008010 | Complete |
| 02.04 a. Surveillance | 2008009<br>2008010 | Complete |

| IP Section | Inspection Report (s) | Status |
|---|---|---|
| 02.04 b. Audits | 2008009<br>2008010 | Complete |
| 02.05 Design Control by Contractors | | N/A |
| 02.06 Installation of Onsite Design | 2008009<br>2008010 | Partially Complete (Need to inspect two more design activities) |
| 40504 Part 52, Identification and Resolution of Construction Problems | | |
| **02.01 Programmatic Review of Construction Phase PI&R Processes**<br>02.01 a. Review QA Manual and Procedures pertaining to PI&R process | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 b. Review applicable plans, manuals, procedures… | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 c. Verify appropriate thresholds | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 d. Review means for using site-specific risk information with other factors to determine significance | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 e. Self-assessments of PI&R process | 2008006<br>2008007<br>2008009<br>2008010<br>2009602 | Complete |
| 02.01 f. Use of OE | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| 02.01 g. Ensure extended QA program coverage as described in DCD | N/A | N/A |
| 02.01 h. Review any alternative program to CAP (such as ECP) | 2008006<br>2008007<br>2008009<br>2008010 | Complete |
| **02.02 Programmatic Review of Other Construction Phase Safety Culture Components and SCWE aspects**<br>02.02 a. Assess licensee's policies, programs and procedures. | 2008006<br>2008007<br>2008009<br>2008010 | Complete |

U.S.NRC
United States Nuclear Regulatory Commission
*Protecting People and the Environment*

# Watts Bar 2 Construction Project 2008 Annual Assessment

April 14, 2009

1

## Purpose of Meeting

- Discuss the NRC's 2008 annual assessment of the Watts Bar 2 construction project.
- Provide an overview of the construction inspection program for Watts Bar 2.
- Respond to questions and comments from the public.

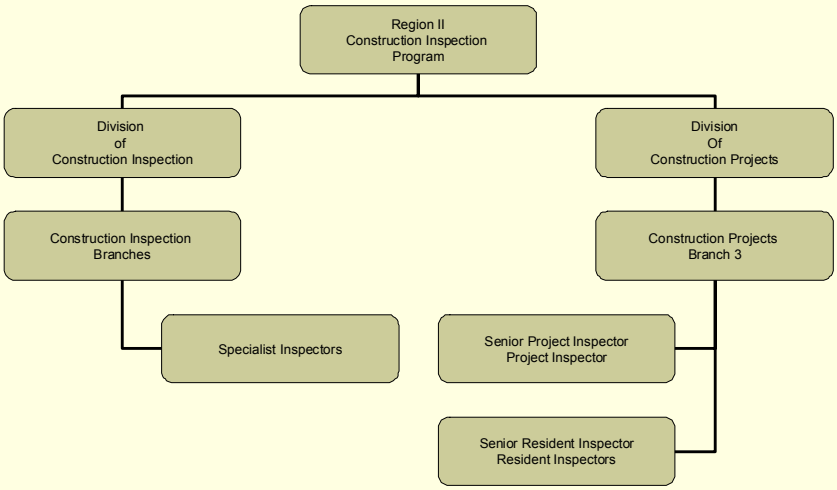
2

# Background

- 1985; TVA suspended construction of Watts Bar Unit 2.
- 1990-1995; TVA concentrated on construction of Unit 1 and addressed quality issues on Unit 1.
- July 2000; TVA informs NRC that Unit 2 is in a deferred status in accordance with Commission Policy Statement
- August 3, 2007; TVA informed NRC of its plan to resume construction of Watts Bar Unit 2.
- July 7, 2008, the NRC issued an Order extending the Watts Bar Unit 2 construction permit completion date to March 31, 2013.

3

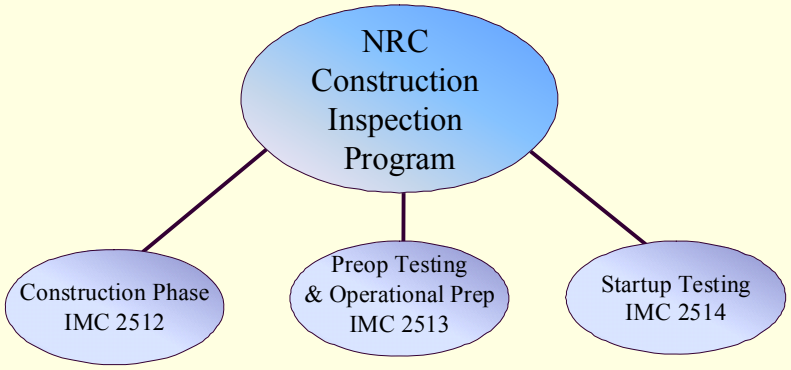
# Construction Inspection Organization




4

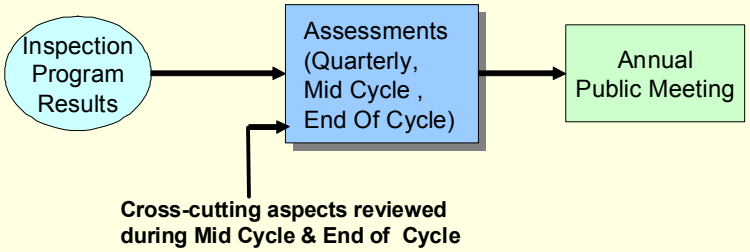
# Construction Inspection Program

- IMC 2517, Watts Bar Unit 2 Construction Inspection Program, supplements traditional inspection program




5

# Assessment Process




6

## Scope of Inspections in 2008

- Completed four quarterly inspections; in addition to three resident inspector, 11 regional inspectors conducted inspections for one or more weeks in 2008.
- Completed Readiness Inspection in March 2008; 10-man weeks of inspection; focused on TVA's ability to conduct safety-related work.
- Key areas of 2008 inspections; quality assurance program; TVA's oversight of contractors; procedure and program development; and actual construction activities.
- Also inspected training and qualification of key personnel and procurement activities.

7

## Inspection Program Results

- Overall the inspections concluded that TVA's program and procedures were adequate to support ongoing construction activities.
- With the exception of two severity level IV violations construction activities were performed in accordance with NRC regulations and requirements.
- The corrective program was generally effective in identifying, classifying, and resolving problems.

8

## Upcoming Inspection Activities

- Continue to inspect construction activities specified in IMC 2512.
- Inspect "Other Areas"
  - Corrective Action Programs (CAPs)
  - Special Programs (SPs)
  - Generic Communication items
  - Open Items
- Perform Problem Identification and Resolution inspection.

9

# QUESTIONS?

10

# WATTS BAR END OF CYCLE
# PUBLIC MEETING

Sweetwater, TN

April 14, 2009

Attendees

| Name (Print) | Title and Organization |
|---|---|
| Kay Whittenburg | Communications – TVA |
| Betty Hamby | McMinn County. EMA, Director |
| Rosemary Gilson | Public |
| Mike Brandon | License Manager – TVA – WBN U1 |
| Masoud Bajestani | TVA |
| Greg Boerschig | TVA |
| Linda Monk | Public |
| Ed Marcum | Knoxville New Sentinel |
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## LIST OF ACRONYMS

| | |
|---|---|
| ABSCE | Auxiliary Building Secondary Containment Enclosure |
| ANSI | American National Standards Institute |
| ASL | Approved Suppliers List |
| ASME | American Society of Mechanical Engineers |
| CFR | Code of Federal Regulations |
| DCN | Design Change Notice |
| EDCR | Engineering Document Construction Release |
| ESL | Evaluated Suppliers List |
| GTAW | Gas Tungsten Arc Welding |
| IP | Inspection Procedure (NRC) |
| MEL | Master Equipment List |
| MRC | Management Review Committee |
| NCV | Non-Cited Violation |
| NDE | Non-Destructive Examination |
| NRC | Nuclear Regulatory Commission |
| PDS | Procurement Data Sheet |
| PER | Problem Evaluation Report |
| PO | Purchase Order |
| QA | Quality Assurance |
| QC | Quality Control |
| RPV | Reactor Pressure Vessel |
| RT | Radiographic Testing |
| SAR | Safety Analysis Report |
| SSC | Structures, Systems, and Components |
| SSPS | Solid State Protection System |
| TVA | Tennessee Valley Authority |
| WBN | Watts Bar Nuclear Plant |
| WO | Work Order |