



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

December 16, 2011

Mr. Michael D. Skaggs
Senior Vice President
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Tennessee Valley Authority
6A Lookout Place
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Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2011609**

Dear Mr. Skaggs:

On November 19, 2011, 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 December 2, 2011, with Mr. David Stinson 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.

Based on the results of this inspection, the enclosed 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 2.3.2 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).

Should you have questions concerning this letter, please contact us.

Sincerely,

/RA by David Gamberoni Acting For/
Robert C. Haag, Chief
Construction Projects Branch 3
Division of Construction Projects

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

Enclosure: Inspection Report 05000391/2011609 w/Attachment

cc w/encl: (See next page)

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Letter to Michael D. Skaggs from Robert C. Haag dated December 16, 2011.

SUBJECT: WBN NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2011609

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2011609

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: 1260 Nuclear Plant Rd
Spring City TN 37381

Dates: October 2 – November 19, 2011

Inspectors: T. Nazario, Senior Resident Inspector, Construction Projects
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OA.1.2, OA.1.9, and OA.1.10
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Approved by: Robert C. Haag, Chief
Construction Projects Branch 3
Division of Construction Projects

EXECUTIVE SUMMARY

Watts Bar Nuclear Plant, Unit 2

This integrated inspection included aspects of engineering and construction activities performed by TVA associated with the Watts Bar Nuclear (WBN) Plant Unit 2 construction project. This report covered a seven-week period of inspections in the areas of quality assurance, identification and resolution of construction problems, construction activities, and follow-up of other activities. The inspection program for Unit 2 construction activities is described in NRC Inspection Manual Chapter 2517. Information regarding the WBN Unit 2 Construction Project and NRC inspections can be found at <http://www.nrc.gov/info-finder/reactor/wb/watts-bar.html>.

Inspection Results

- A Severity Level (SL) IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for failure to perform layup and preventative maintenance (LUPM) activities on the 2A-A and 2B-B containment spray pumps in accordance with site procedures. (Section C.1.6)
- The inspectors concluded that concerns pertaining to several open items, including Temporary Instructions (TIs) and construction deficiency reports (CDRs), have been appropriately addressed for WBN Unit 2. These items are closed.
- Other areas inspected were adequate with no findings of significance identified. These areas included various Unit 2 Corrective Action Programs (CAPs)/Special Programs (SPs); electrical systems and components; mechanical systems and components; fire protection; nuclear welding; nondestructive examination (NDE), commercial grade dedication activities; and refurbishment.

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REPORT DETAILS

Summary of Plant Status

During the inspection period covered by this report, TVA performed construction completion activities on safety-related systems and continued engineering design activities of the Watts Bar Nuclear (WBN) Plant, Unit 2.

I. QUALITY ASSURANCE (QA) PROGRAM

Q.1 QA Oversight Activities

Q.1.1 Identification and Resolution of Construction Problems (Inspection Procedure (IP) 35007)

a. Inspection Scope

During this inspection period, the inspectors continued to review problem evaluation reports (PERs), as part of the applicant's corrective action program to verify that issues being identified under the corrective action program were being properly identified, addressed, and resolved by the applicant. The inspectors also reviewed quality assurance (QA) surveillance reports to ensure conformance with quality requirements, as discussed in other sections of this report.

b. Observations and Findings

No findings of significance were identified. During both independent NRC reviews and observation of management review committee meetings of PERs, the inspectors noted examples where PERs lacked detail in both the description of the issues and the corrective actions.

Also, during the Piping Support and Anchor Bolt inspections discussed in sections C.1.3 and OA.1.3 of this report, the inspectors noted that an effectiveness review for PER 297689, "Trend PER for QC reject rate," took approximately nine months (since December 2010) to complete. Meanwhile, issues similar to those discussed in the original PER continued to exist during that time period. The missed effectiveness review was self-identified by the applicant in PERs 431856 and PER 452524. The inspectors also observed that the apparent cause, craft not self-checking, in PER 297689 appeared to be inadequate in that after further inspection and interviews with the craft, the inspectors discovered that training and work instruction gaps may have led to the increased reject rates and non-conforming conditions since December of 2010. The applicant took immediate corrective action which included retraining of personnel and enhanced work instructions. Because the missed effectiveness review was self-identified and because the anchor bolt installation activities observed were considered work in progress, the inspectors noted this as an observation which was shared with the applicant and documented in PERs 454859 and 452512.

c. Conclusions

Observations were shared with the applicant regarding the level of detail in PER descriptions, timeliness of corrective actions, and a weakness in a cause evaluation.

With the exception of those PERs noted above, the inspectors found that generally the PERs and QA surveillances reviewed were properly identified, addressed, and resolved.

Q.1.2 Safety Conscious Work Environment (IP 35007)

a. Inspection Scope

The inspectors reviewed existing program requirements and recent safety-related concerns identified by the applicant's and contractor's employee concerns program (ECP). The inspectors verified that significant problems were documented under the corrective action program and were being properly identified, addressed, and resolved by TVA.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors did not identify any issues or concerns regarding the ability of the applicant to provide a safety-conscience work environment.

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

C.1.1 Unit 1 and Unit 2 Construction Activity Interface Controls

a. Inspection Scope

During the inspection period, the inspectors independently assessed applicant controls associated with Unit 2 construction work activities that were relied upon to prevent adverse impacts on Unit 1 operational safety. The inspectors attended routine Unit 1/Unit 2 interface meetings to assess the exchange and sharing of information between the two site organizations. Periodic construction and planning meetings were observed to assess the adequacy of the applicant's efforts to identify those construction activities that could potentially impact the operating unit. This included the review of selected work activities that the applicant had screened as not affecting Unit 1 to verify the adequacy of that screening effort. Additionally, the inspectors independently assessed selected construction activities to verify that potential impacts on the operating unit had been identified and adequately characterized with appropriate management strategies planned for implementation. Furthermore, the inspectors performed independent walkdowns of selected construction work locations to verify controls that protect the operating unit provided an adequate level of protection and had been properly implemented.

Specific work activities observed included:

- Hydrostatic testing of portions of the component cooling water (CCS) system under the following work orders:
 - Work order (WO) 111617727, CCH Sys 70 WBN-2-PIPE-070-C Pressure Test 2-070-Hydro-B004

- WO 111617876, CCH Sys 70 WBN-2-PIPE-070-C Pressure Test 2-070-Hydro-B005
- Safety-related motor control center (MCC) bucket change-out under WO 112704132.

The inspectors also reviewed and inspected activities that the applicant had screened out as not affecting Unit 1. These included, but were not limited to, the following:

- Residual heat removal (RHR) 2A-A pump inlet strainer installation and flange repair under WO 112309656

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Adequate management oversight and controls were in place to identify construction activities which could potentially impact the operating unit, and an adequate level of protection had been implemented.

C.1.2 Electrical Components – Work Observation and Construction Refurbishment Process (IPs 51053 and 37002)

a. Inspection Scope

The inspectors observed vendor (Qualtech) performed work activities associated with the construction refurbishment of safety-related motor control center retrofit replacement breakers under WO 112704132. In particular, the inspectors observed vendor onsite replacement of the defective transformers. Documents reviewed are listed in the attachment.

Specifically, the inspectors also observed the following activities:

- Storage, handling and protection; and
- Installation which included verification that tolerances/clearances were met; appropriate drawings and work procedures were available; and holdpoints were observed.

The following samples were inspected:

- 51053, 02.02.b, c, d, e – 1 sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Field refurbishment of safety-related electrical components was performed per the approved refurbishment program and procedures. Vendor oversight was adequate for the activities observed.

C.1.3 Pipe Support and Restraint Systems (IP 50090, 35020 and TI 2512/023)

a. Inspection Scope

The purpose of IP 50090 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, installation records, nonconformance reports, personnel qualifications, audit reports, interviews with applicant personnel, and observation of work activities. Integrated Inspection Report (IIR) 05000391/2009602 (ML091210420), Attachment 2, documented reconstitution results and a review of all the previous NRC inspection reports to determine the status of partial completion of IP 50090 requirements. This reconstitution review concluded that inspection requirements for this IP were not fully met, because additional inspection efforts for IP Sections 2.03.b, 2.03.c, 2.03.d, 2.03.e, and 2.03.f were required. Specifically, the reconstitution recommended inspecting a number of samples representative to about 50 percent of the total required samples contained in Sections 02.03.b thru 02.03.f. All sections contained within this IP were recently inspected to ensure that the IP requirements were met and recent changes to programs or procedures for new work would not invalidate commitments and previous inspection efforts performed during initial construction stages.

The following table lists the associated inspection reports and the completion status for each IP section (a table listing specific supports inspected, and a list of documents reviewed are included in the Attachment):

IP Section	Inspection Reports	Description of inspection effort since construction resumed in 2008 (05000391/2011609)
Section 2.01, "Review of QA Implementing Procedures"		
Section 02.01	05000391/2009602 05000391/2009603 05000391/2011607	<ul style="list-style-type: none"> - Reviewed a sample of procedures for audits, assessments, and surveillances - Reviewed the existing auditor qualification procedures, audit reports, and organizational charts to ensure that auditors did not have direct responsibility in the areas being audited. - Reviewed a sample of design and procurement documents to ensure that these technical requirements were appropriately implemented. - Reviewed a sample of design and field change procedures applicable to pipe support and restraint systems - Reviewed procedures and verified that provisions had been established to ensure that quality requirements were met. These included installation procedures, datasheets, and corrective action program procedures. In addition, IIR 05000391/2009602, Attachment 3 and IIR 05000391/2011611 documented a review of QA program documents and the corrective action program, respectively. - Reviewed craft and inspection personnel qualification and

		training requirements included in QA procedures. In addition, IIR 05000391/2010603 documented a review of welding and welder qualification procedures.
Section 2.02, "Review of Work Procedures"		
Section 02.02	05000391/2009602 05000391/2009603 05000391/2009604 05000391/2010603 05000391/2011604 05000391/2011607	Reviewed a sample of construction documents that were produced as part of the construction process of installing three pipe supports. Specific design inputs, design changes, drawings, calculations, and implemented procedures pertaining to pipe supports and restraints were among the documents reviewed to ensure they complied with approved drawings and specifications. Field Check-lists and procurement documents were also reviewed to ensure pre-installation and in-process inspections were performed accordingly.
Section 2.03, "Observation of Work and Work Activities"		
Section 02.03.a	05000391/2010603 05000391/2010604 05000391/2010605 05000391/2011605 05000391/2011607	Recent inspection efforts documented at least ten samples of interviews related to fixed pipe supports; however, during these recent inspection efforts no personnel engaged in the installation and testing of dynamic supports were interviewed. Installation of modified or new dynamic supports had not yet been completed. This section will remain open for future inspection.
Section 02.03.b	05000391/2010603 05000391/2010605 05000391/2011603 05000391/2011604 05000391/2011605 05000391/2011607 05000391/2011608	Recent inspection efforts documented additional inspections of at least fifteen pipe support systems and portions of the installation and testing of concrete anchor bolts for fifteen component support elements. These recent inspection efforts were sufficient to satisfy the minimum original sampling requirements from this IP section.
Section 02.03.c	05000391/2011603	Recent inspection efforts documented additional inspections of at least two dynamic supports. These recent inspection efforts were not sufficient to satisfy the minimum original sampling requirements from this IP section. This section will remain open for future inspection, because sufficient samples have not been inspected due to remaining work involving installation of modified or new dynamic supports.
Section 02.03.d	05000391/2010603 05000391/2011603 05000391/2011604 05000391/2011605 05000391/2011607	Recent inspection efforts documented additional inspections of at least eighteen installed spring hanger assemblies, ninety-three installed pipe support systems of different sizes, and twenty-five small-bore or instrumentation line supports. These recent inspection efforts were sufficient to satisfy the minimum original sampling requirements for this IP section.
Section 02.03.e	05000391/2009603 05000391/2009604 05000391/2011603 05000391/2011604 05000391/2011605 05000391/2011607	During this inspection, component and multiple pipe supports previously accepted by quality control (QC) were sampled to verify their compliance with NRC requirements and applicant commitments. The inspectors conducted walkdowns of several installed safety-related pipe supports. Specifically, the inspectors performed a visual inspection to verify adequate support clearances and installation, and the absence of deformation and corrosion. Independent measurements were also performed to determine whether the installed configuration of pipe supports was consistent with final as-built drawings, and weld surfaces met the applicable codes and standards. Recent inspection efforts documented additional inspections on at least

		nine components and one multiple pipe support. Additionally, during this inspection, eight components and five multiple pipe supports were examined. These recent inspection efforts were sufficient to satisfy the minimum original sampling requirements from this IP section.
Section 02.03.f	05000391/2009602 05000391/2009603 05000391/2009604 05000391/2010603 05000391/2011603 05000391/2011604 05000391/2011605 05000391/2011607	Recent inspection efforts documented additional inspections of at least 122 as-built/final design pipe supports and 200 pipe anchor locations. These recent inspection efforts were sufficient to satisfy the minimum original sampling requirements from this IP section.
Section 2.04, "Review of Records"		
Section 02.04.a	05000391/2009603 05000391/2009604	<p>-Reviewed records and documentation associated with the installation of three fixed pipe supports to determine the following:</p> <ul style="list-style-type: none"> • The type and classification of pipe support or restraints complied with appropriate drawings and specifications • The location, spacing and critical clearances met the applicant's specifications and was verified by QA/QC inspection • The required scope of QA/QC was met • The weld identification/location conformed to the respective weld card, drawing, work order or other welding documentation • The welding material used corresponded to the material specified on the work order • Welders were qualified to the welding procedures used and welding procedures were in accordance with code requirements <p>Recent inspection efforts documented additional inspections of at least thirty fixed pipe supports; however, these recent inspection efforts were not sufficient to satisfy the minimum original sampling requirements for dynamic supports. This section will remain open for future inspection, because sufficient samples have not been inspected due to remaining work involving installation of modified or new dynamic supports.</p>
Section 02.04.b	05000391/2011608	<p>Reviewed three problem evaluation reports (PERs) associated with pipe supports and restraints to determine the following:</p> <ul style="list-style-type: none"> • The records adequately document current status of nonconformances and deviations. • The records are legible, complete, and indicate that reports are promptly reviewed by qualified personnel for evaluation and disposition. • The records are routinely being processed through established channels for resolution of the immediate problem as well as for generic implications. • The records are being properly identified, stored, and can

		<p>be retrieved in a reasonable time.</p> <ul style="list-style-type: none"> • Nonconformance reports include the status of corrective action or resolution. • Resolution of nonconformances is appropriate and demonstrates good engineering practice. <p>IIR 05000391/2011611 documented a review of the corrective action program. Inspectors reviewed PERs in all areas, including pipe supports, as part of their routine review of the corrective action program as documented in previous inspection reports. Additional inspection efforts will be performed in this area to evaluate the resolution of recently identified non-conformances including those for dynamic supports.</p>
Section 02.04.c	05000391/2011605	<p>Twenty-one qualification and training records of engineering, craft, and inspection personnel (four engineering, three craft, two inspection, and ten audit personnel) from TVA, Bechtel, and subcontractors performing activities associated with pipe support and restraint installation work were reviewed to determine if these persons were qualified to conduct the work they were performing.</p>
Section 02.04.d		<p>During this inspection, three audit reports, five surveillance reports, one assessment report, and two quality assurance oversight reports relevant to the installation of pipe supports and restraints were reviewed to ensure that audits reported sufficient detail, were performed in the required functional areas, and were performed in accordance with the schedule and stated requirements.</p> <p>From the audit reports, three PERs were reviewed and compared to the audit report findings that referenced them to determine if the audit findings were reported in sufficient detail to permit a meaningful assessment by those responsible for corrective action, final disposition, and trending. Corrective actions were completed for the PERs, and they were reviewed to determine that proper follow-up actions were taken.</p>

The following samples were inspected during this inspection period:

- IP 50090 Section 02.01 – 1 sample
- IP 50090 Section 02.02 – 4 samples
- IP 50090 Section 02.03.e – 13 samples
- IP 50090 Section 02.04.a – 3 samples
- IP 50090 Section 02.04.b – 3 samples
- IP 50090 Section 02.04.c – 21 samples
- IP 50090 Section 02.04.d – 11 samples
- IP 35020 Section 02.01 – 1 sample

b. Observations and Findings

No findings of significance were identified.

The following table summarizes the completion status for each IP section:

IP Section	Completion Status
Section 02.01	Closed
Section 02.02	Closed
Section 02.03.a	Open This section will remain open for further inspection. The inspectors were not able to interview applicant personnel engaged in the installation of hydraulic units, because installation of modified or new dynamic supports had not yet been completed.
Section 02.03.b	Closed
Section 02.03.c	Open This section will remain open for further inspection. The minimum required samples were not met, because installation of modified or new dynamic supports had not yet been completed.
Section 02.03.d	Closed
Section 02.03.e	Closed
Section 02.03.f	Closed
Section 02.04.a	Open This section will remain open for further inspection. The minimum required samples were not met, because installation of modified or new dynamic supports had not yet been completed.
Section 02.04.b	Open This section will remain open for further inspection. Additional inspection efforts will be performed on this area to evaluate the resolution of recent identified non-conformances, including those associated with dynamic pipe supports.
Section 02.04.c	Closed
Section 02.04.d	Closed

c. Conclusions

The procedures and records reviewed during this inspection period, associated with pipe support and restraint systems were found to conform to the applicable regulatory requirements. The requirements of this IP were not fully met for several IP sections; however the majority of the sections from this IP were considered to be complete. This determination was made based on initial construction inspections and recent inspection efforts for new work; therefore, for those sections that are not complete additional inspections will be performed and these sections will remain open until the sampling requirements are met. In addition, if major changes to the applicant's instructions and procedures are identified through observation of future work activities associated with pipe support and restraint systems; the inspectors will inspect those as necessary to satisfy the requirements in this procedure.

C.1.4 Piping – Work Observation (IPs 49063 and 37002)

a. Inspection Scope

The inspectors observed work activities associated with the construction refurbishment and acceptance of safety-related piping systems and passive components within the component cooling water (CCS) system and residual heat removal (RHR) system. The inspectors reviewed work instructions and procedures to verify that they identified

requirements and provisions for ensuring that the material condition of accessible portions of piping systems was evaluated and documented prior to final assembly of associated components. The inspectors also reviewed actions associated with Information Notice 85-96, "Temporary strainers left installed in pump suction piping" and observed the existence of a physical tab that protruded from the flanged fitting to identify its presence. The inspectors also reviewed personnel qualifications to verify that they were qualified for the roles they performed, that procedures detailed necessary actions and were followed by the craft. The inspectors also reviewed corrective action documents to verify that work activities promptly identified any failures, malfunctions, deficiencies, deviations, defective materials and equipment, and non-conformances in safety or quality-related structures, systems, or components (SSCs), and that material identification and control measures were in place and appropriately implemented. Documents reviewed are listed in the attachment.

The following areas were inspected:

- Hydrostatic testing of Unit 2 portions of the CCS system
- Flange repair on the RHR pump suction inlet strainer

The following samples were inspected:

- IP 49063 Section 02.02 - 2 samples

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Hydrostatic testing was performed per the associated WO and test package instructions and adequate controls were in place to support an adequate repair of the flange seating face while protecting the pipe surface and internals. With respect to pump inlet strainers, the applicant has adequately implemented controls to ensure that temporary construction devices do not affect operational activities.

C.1.5 Electrical Cable – Work Observation (IPs 51063 and 37002)

a. Inspection Scope

The inspectors assessed whether activities relative to safety-related electric cable systems were controlled and accomplished in accordance with NRC requirements, safety analysis report commitments, and applicant procedures. This was accomplished by inspecting supervision, independent evaluation of work performance, work in progress, and completed work. The inspectors reviewed a portion of cable pull activities associated with WO10-951137-003; specifically, a replacement of pull-by cable, 2V4433A, to determine whether:

- Latest approved revisions were utilized
- Specifications were complete
- Cable tensions were within limits
- Conduit/raceway was acceptable for use

- Cable protection was adequate
- Segregation was maintained
- Cable identification was preserved
- Bending radius was maintained within limits
- Boundary conditions were specified and appropriate
- QC inspectors were present and performing their assigned tasks
- Installation and inspection activities were being documented during the activity

The following sample was inspected:

- IP 51063 2.02.c – 1 sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that adequate measures were in place to ensure the applicant was prepared for the cable pull/push and that procedures were adequate and followed during the pull/push operations, with appropriate QC oversight.

C.1.6 Mechanical Components – Work Observation (IP 50073)

a. Inspection Scope

The inspectors observed work in progress and reviewed documentation to determine whether activities affecting safety-related mechanical components were accomplished in accordance with NRC requirements and applicant commitments.

Specifically, the inspectors verified that work instructions and procedures identified requirements and provisions for ensuring adequate receipt inspection and proper location, placement, orientation, alignment, mounting, flow direction, tolerances, and expansion clearance for safety-related mechanical components. The inspectors verified that these instructions were followed during component receipt and installation and that appropriate QC hold points were observed. Additionally, the inspectors reviewed WOs and associated documentation to determine whether special requirements for long-term storage had been met. The following components were inspected:

- 2A-A containment spray pump
- 2B-B containment spray pump
- 2B-B containment spray pump motor
- 2B-B containment spray heat exchanger
- Unit 2 AFW pump turbine

The following samples were inspected:

- IP 50073 Section 02.02.a – 1 sample
- IP 50073 Section 02.02.c – 3 samples
- IP 50073 Section 02.03.d – 5 samples

b. Observations and Findings

The inspectors identified the following non-cited violation (NCV):

Introduction: A Severity Level (SL) IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for failure to perform layup and preventative maintenance (LUPM) activities on the 2A-A and 2B-B containment spray pumps in accordance with site procedures.

Description: On January 19, 2010, the applicant began on-site refurbishment of the 2A-A and 2B-B containment spray pumps. This work included disassembly and inspection of the pumps and subsequent cleaning or replacement of various piece parts according to their material condition. These refurbishment activities concluded on September 27, 2010, when both pumps were installed in their final locations.

During a review of the two WO packages for the refurbishment, the inspectors noted that the following LUPM activities were delineated by the vendor technical document (VTD) but were not listed as steps in either WO:

- Fill the pump bearing housing with rust inhibiting lubricating turbine oil
- Store the mechanical seal package separately after one year of pump layup
- Coat shaft sleeve and exposed portions of shaft with rust preventative
- Rotate pump shaft every three months to recoat bearings with lubricant

The inspectors also noted that the Bechtel procedure 25402-000-GFP-000-N1304, System/Component Layup, Rev. 1, states that vendor-recommended LUPM activities shall be performed unless justified by an engineering evaluation. On October 5, 2011, the inspectors questioned the applicant as to whether the activities had been performed or whether such an evaluation had been completed.

On October 6, 2011, the applicant initiated PER 444516 to evaluate the conditions identified by the inspectors. The applicant concluded that neither the vendor-recommended LUPM activities nor an engineering evaluation had been performed for the Unit 2 containment spray pumps although the pumps had been installed and idle since September 27, 2010.

This finding was determined to be more than minor because it represented an improper work practice (failure to perform LUPM) that can impact safety by adversely affecting the material condition of the safety-related Unit 2 containment spray pumps. The finding is of low safety significance because the work practice was not indicative of a breakdown in the applicant's QA program for construction; and was not the result of multiple and recurring significant deficiencies associated with a construction activity.

This finding is related to the work control component of the Human Performance cross-cutting area, as defined in Inspection Manual Chapter (IMC) 0310, because the applicant failed to incorporate actions to address the need for work groups to communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance H.3(b). Specifically, the applicant's work control processes failed to address the need for construction personnel to promptly inform personnel responsible for LUPM when items subject to degradation (e.g., gaskets, bearings) are installed in a component. The lack of this

prompt notification led to a condition where the containment spray pumps did not receive vendor-recommended maintenance for over one year.

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

Section 6.19 of Bechtel Procedure 25402-000-GPP-0000-N1304, System / Component Layup, Rev.1, states that vendor-recommended LUPM activities shall be performed for items in long term storage unless justified by an engineering evaluation.

Contrary to the above, activities affecting quality were not performed in accordance with applicable instructions and procedures. Specifically, vendor-recommended LUPM activities for both Unit 2 containment spray pumps were not performed and an engineering evaluation to justify the lack of LUPM was not completed.

This finding was determined to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the examples supporting the violation were entered into the applicant's corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000391/2011609-01, Failure to Perform Layup and Preventative Maintenance on Safety-Related Components.

c. Conclusions

The inspected activities associated with LUPM activities were not performed in accordance with applicant procedures and NRC regulations as discussed above in NCV 05000391/2011609-01; however, other activities observed were performed in accordance with applicable procedures and regulations.

C.1.7 Coatings (IP 37002)

a. Inspection Scope

The inspectors observed work activities associated with the construction inspection and refurbishment of service level (CSL)-1 coating in upper containment inside the reactor building. The inspectors verified proper qualification, storage, handling, and control of safety-related coating materials/systems. The inspectors assessed whether personnel were adequately qualified for the roles they performed. The inspectors assessed whether existing CSL-1 coatings were inspected and repaired or maintained in accordance with applicable procedures and specifications. The inspectors also observed the preparation and application of coatings in CSL-1 areas associated with WO 112257658 to verify that they were adequately documented per the applicable procedures. Documents reviewed are listed in the attachment.

The following sample was inspected:

- IP 37002 Section 02.02.d – one sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Inspected refurbishment activities associated with coatings in CSL-1 areas in containment were adequate.

C.1.8 (Closed) Concrete Expansion Anchors (IP 46071 and TI 2512/023)

a. Inspection Scope

The purpose of this IP was to confirm concrete expansion anchors were properly installed and that the applicant's response was consistent with commitments made in response to Bulletin (BL) 79-02, Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts. The inspectors observed control of specific materials, control of specific processes and activities, and reviewed as-built installations. IIR 05000391/2009602 (ML091210420), Attachment 2, contained a review of all the previous NRC inspection reports to determine the status of completion of IP 46071 requirements.

This review (or "reconstitution") concluded that inspection requirements for this IP had not been fully met, because additional inspection activities for IP Sections 02.02 and 02.03 were required. Specifically, the reconstitution recommended inspection of 172 samples for Section 02.02 and 100 samples for Section 02.03.

Section 2.01, "Review of QA program," required a review to determine the adequacy of established QA procedures, plans, and instructions involving concrete expansion anchors as well as the applicant's response to BL 79-02. Previous inspections results in this area were documented in inspection reports 05000391/2009602, 05000391/2009603, and 05000391/2011603

The inspectors reviewed NRC letter to TVA dated February 11, 2009 (ML090210107) which described the staff's review of TVA's description of the Hanger Analysis and Update Program (HAAUP). This letter acknowledged that the HAAUP would be implemented in a manner similar to Unit 1 and would incorporate corrective actions identified during the Unit 1 implementation of the HAAUP and response to BL 79-02.

The inspectors reviewed TVA's closure report for Bulletin 79-02 for Watts Bar Unit 1, which is described in a letter to the NRC dated August 21, 1985. This report was applicable to Unit 2 because it addresses anchor bolts that were acquired from common lots during the time construction was ongoing for both units.

The inspectors also reviewed NUREG-0847, Supplement 8, dated January 1992, and confirmed that NRC staff had approved the methodology discussed above and that the same methodology used on Unit 1 to address BL 79-02 was being followed for Unit 2. Finally, the inspectors reviewed Bechtel procedure 25402-000-GPP-0000-N3212, Drilled-In Anchors and Core Drilling Operations, to ensure no significant changes were made since the initial review that would invalidate previous inspection results.

Section 2.02, "Observation of Work," required, in general, direct observation of work performance, work in progress, and completed work, to determine whether concrete expansion anchor activities were accomplished in accordance with applicant commitments. The requirements of this IP section were partially completed and

documented in IIR 0500039/2009602, which required a minimum sample of 172 anchor bolts.

Section 02.02.a of this IP addressed control of specific materials while Section 02.02.b addressed the control of specific processes or activities. To satisfy the requirements of the IP, the inspectors typically looked at both control of materials and control of processes during an inspection of a work activity; therefore, the intent of 02.02 was met when inspecting one or both of these attributes. In summary, eventhough the following recent inspection reports may only specify 02.02.a or 02.02.b or 02.02, the observation of ongoing work was accomplished and the intent of 02.02 was met for the overall control of materials and processes:

- 05000391/2010-603
- 05000391/2010-604
- 05000391/2010-605
- 05000391/2011-602
- 05000391/2011-603
- 05000391/2011-605
- 05000391/2011-607
- 05000391/2011-608

These recent inspection efforts documented inspections of at least 200 concrete anchor bolt installations which were sufficient to satisfy the minimum sampling requirements from this IP section.

Section 02.03, "Review of As-Built Portions," required, in general, independent as-built verification and visual examination of at least 200 installed or quality-control-accepted concrete anchors of various bolt diameters. This requirement was to ensure that construction was consistent with NRC requirements and applicant commitments. Recent inspection efforts documented additional inspections of at least 200 concrete anchors in the following inspection reports:

- 05000391/2009-603
- 05000391/2009-604
- 05000391/2011-603
- 05000391/2011-604
- 05000391/2011-605
- 05000391/2011-607

These recent inspection efforts were sufficient to satisfy the minimum original sampling requirements from this IP section.

b. Observations and Findings

No findings of significance were identified.

Below is a summary of each section of IP 46071:

Section 02.01– Closed
 Section 02.02 – Closed
 Section 02.03 – Closed

c. Conclusions

The procedures and records reviewed during this inspection period associated with concrete expansion anchors were found to conform to the applicable regulatory requirements. Based on initial construction inspections and recent inspection efforts, IP 46071 is considered closed; however, implementation, final review, and closure of actions for BL 79-02 will be reviewed once the applicant finalizes the HAAUP CAP closure report for Unit 2. In addition, if major changes to the applicant's instructions and procedures are identified through observation of future work activities associated with concrete expansion anchors, the inspectors will inspect those as necessary to satisfy the requirements in this procedure

T.1 Training and Qualification of Plant Personnel

T.1.1 Engineering Organization Training (TI 2512/022)

a. Inspection Scope

The inspectors observed a classroom training session for engineering personnel that covered the walkdown, design, and drawing creation guidelines to be utilized in the installation of Thermo-Lag electrical raceway fire barriers (ERFBs). The training session was intended to be an introduction on the use of TVA contractor's Field Manual. Training was also provided for the application of TVA General Engineering Specification G-98, Installation, Modification and Maintenance of Electrical Raceway Fire Barrier Systems, Rev. 5, dated December 17, 1997. The training emphasized the requirements of Appendix 7.1, Special Requirements and Application of Thermo-Lag 330-1 One-Hour Rated Electrical Raceway Fire Barrier Systems. At the end of the training session the instructor administered a written exam which all attendees completed and passed.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

TVA's program for training of contractor personnel associated with fire barrier systems was adequate.

III. OPERATIONAL READINESS ACTIVITIES

F.1 Fire Protection

F.1.1 Fire Protection (IP 64051)

a. Inspection Scope

The inspectors observed hot work, control of flammable material, and control of ignition sources in both the Unit 2 and shared U1/U2 areas. The inspectors verified that TVA inspected the fire suppression devices per site procedural requirements at the prescribed intervals. The inspectors verified the availability of auxiliary equipment necessary to meet procedural guidance. Additionally, the inspectors interviewed the fire watches who were responsible for overseeing hot work activities occurring in the

auxiliary building, valve vault room, and Unit 2 containment. The inspectors also interviewed continuous and roving fire watch personnel. The inspectors reviewed hot work procedures to verify their adequacy related to fire suppression during construction activities taking into account the impact on the operating unit and attended the hot work training course (TRN-32) that is required for fire watch personnel. Documents reviewed are listed in the attachment.

The inspectors observed the following hot work activities involving welding and/or grinding:

- WO 110805640, CCI EDCR 253622, Sys 062 2-RTV-062-0365A
- WO 111141416, CCM EDCR 52475C, Sys 062, WB2-2-HGR-062-AB
- WO 112212599, CCM EDCR 56966B, Sys 062, WBN-2-HGR-062-AB

The following samples were inspected:

- IP 64051 Sections 02.01 – 1 sample
- IP 64051 Sections 02.04 – 1 sample
- IP 64051 Sections 02.06 – 1 sample
- IP 64051 Sections 02.07 - 10 samples
- IP 64051 Sections 02.08 - 3 samples

b. Observations and Findings

No findings of significance were identified; however, the inspectors observed, through training attendance and field observations, a discrepancy in fire watch duty expectations. Specifically, the training course TRN-32 instructed personnel that, if they are on fire watch, they should have no other job; however, procedure NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work), does not prevent hot work personnel from performing other tasks as long as they are capable of providing continuous fire watch. PER 461395 was initiated to address this observation along with additional observations that the inspectors identified during hot work activities. Immediate corrective actions included a stand-down to reinforce the requirements and expectations for hot work activities.

c. Conclusion

The inspectors concluded that, overall, the level of fire protection provided was adequate for the current level of construction activities being performed. TVA implemented adequate fire protection measures and controls to support Unit 2 construction activities and minimize impact on Unit 1 operation activities.

IV. OTHER ACTIVITIES

OA.1.1 (Discussed) Construction Deficiency Report (CDR) 391/85-26: Failure of Coatings on Containment Vessel Interior (IP 37002)

a. Inspection Scope

Background: In July 1985, the applicant notified the NRC of failing inorganic zinc primer coatings on the interior of the steel containment vessel. The deficient coatings were present from elevation 819' to 830', on the entire circumference of the vessel. The applicant submitted a closure report to the NRC on August 21, 1985 stating the apparent

cause of the failure was improper application of a second coat of zinc primer. The applicant also stated that the deficient coatings were removed and replaced, and all individuals who applied protective coatings were recertified in order to prevent recurrence. This deficiency was originally identified in historical Nonconformance Report (NCR) WBN 6144.

Inspection Activities: The inspectors performed the following:

- Reviewed PER 172633 which was issued to track required Unit 2 actions for historical NCR WBN 6144.
- Reviewed PER 227383 which was issued to address numerous historic coatings issues inside containment, including those associated with NCR WBN 6144
- Reviewed WO110921696, Visual Examination of the U2 Primary Containment Interior, which was issued to identify deficiencies associated with PER 227383
- Reviewed the final report for Failure of Coating on Containment Vessel Interior-WBRD-50-391/85-26, dated August 21, 1985, to verify that corrective action documents adequately captured the original construction deficiency.
- Reviewed General Engineering Specification G-55, Technical and Programmatic Requirements for the Protective Coating Program for TVA Nuclear Plants; TVA Watts Bar Nuclear Unit 2 Construction Completion Project Procedure 25402-000-GPP-000-N3222, Field Painting and Coating; and Watts Bar Nuclear Unit 0 Modification/Addition Instruction MAI-5.3, Protective Coatings; to verify they contained adequate protective coatings applicator certification requirements.
- Reviewed calculation ALION-CAL-TVA-2739-03 Revision 4, Watts Bar Reactor Building GSI-191 Debris Generation Calculation, to verify that assumptions and conditions stated in the calculation enveloped the condition of the protective coatings.

b. Observations and Findings

No findings of significance were identified. Sufficient documentation was not available at the time of the inspection to verify the extent and adequacy of the repairs performed.

c. Conclusion

The inspectors determined that further inspection will be required to verify resolution of the original construction deficiency.

OA.1.2 (Discussed) Emergency Preparedness Confirmatory Item #41 (IP 71114.01)

a. Inspection Scope

Background: The confirmatory item discussed below is identified in NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplemental Safety Evaluation Report No. 22, Section 13.3.2.9, "Emergency Communications."

TVA committed to (1) update plant data displays as necessary to include Unit 2, and (2) to update dose assessment models to provide capabilities for assessing releases from both WBN units. The NRC staff will confirm the adequacy of these items prior to the issuance of the Unit 2 OL.

The scope of the present review is based on the Section 13.3, "Emergency Preparedness," of the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition," NUREG-0800. The SRP provides:

In general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate.

This protocol applies to this inspection in that the Watts Bar Radiological Emergency Plan (WBN REP) was written as a site-wide plan and that TVA proposed, and the Commission accepted, a regulatory framework in which TVA would align the Unit 1 and Unit 2 licensing and design basis to ensure design and operational fidelity between the two units. The adequacy of the WBN REP has been confirmed by the routine NRC inspection oversight, and TVA's performance in biennial exercises conducted since the licensing of Unit 1 in 1996.

This Confirmatory item was generated in response to an applicant response to a staff request for additional information regarding the capability of the WBN emergency response facilities (ERFs) to simultaneously handle an emergency event affecting both WBN Unit 1 and Unit 2 (e.g., events initiated by loss of power, earthquake, tornado, flooding, or hostile actions).

Inspection Activities: The inspector evaluated the status of the plant data display updates to include Unit 2.

b. Observations and Findings

No findings of significance were identified. The instrumentation displays in the MCR are specific to each unit and independent of each other. The data displays in the WBN ERFs are driven by the Plant Engineering Data System (PEDS), which serves as an interface to the plant data on the plant's Integrated Computer System (ICS). The data is displayed on personal computers (PCs) through user-selectable menu options. As such, any PC can access data from Unit 1, Unit 2, or the simulator. The Technical Support Center (TSC) has several PCs that have access to the data, by menu and icon selection, necessary for the individual workstations and functional areas (i.e., emergency response officer (ERO) positions). In addition, there are wall mounted large LCD screens that clone the display on the individual attached PCs. A similar configuration exists in the Onsite Support Center (OSC) with fewer displays and PCs. ICS and PEDS displays are also available within the MCR.

The licensee EP staff demonstrated the PEDS data displays for Unit 2 in the TSC. All of the data screens available for Unit 1 were available for Unit 2 and were online and active. Critical Safety Function Status Tree display screens were also active. Not all planned parameters were active since many plant systems have not been turned over from construction to operations; however, as various plant systems are turned over from construction to operations, the parameters will become active. Some in-service parameters correctly showed inaccurate data as the associated plant system was not in service (e.g., RVLIS data was inaccurate because the reactor vessel is still dry). In the Unit 2 MCR, the unit supervisor demonstrated that he was using the data displays to

monitor current plant system status (e.g., he was monitoring main condenser hotwell level trends in order to control levels due to system test water collecting in the hotwell).

Licensee personnel informed the inspectors that TVA is in the process of obtaining the commercially obtainable MIDAS™ (Meteorological Information and Dose Assessment System) specifically configured for all of the TVA nuclear units. This system will replace the current system that was previously found to be acceptable to the NRC.

In addition to the communications capabilities observed at the WBN site, the inspectors observed the October 19, 2011, WBN Unit 1 exercise from the Central Emergency Control Center (CECC). This facility currently serves all TVA Nuclear sites and was previously found to be acceptable by the NRC. The CECC has seven display screens projected onto a large projection screen in the central CECC area. As with the configuration in the TSC and OSC, these screens are driven by individual PCs. These display screens are selectable as menu options on the associated PC and included PEDS, radiological assessment team and plant assessment team status summaries, a protective action plot, and selected WebEOC™ pages. The majority of the PCs in the CECC had dual monitors allowing multiple displays. Although no Unit 2 screens were displayed during the exercise, the capability would have been available given the PEDS configuration.

c. Conclusions

Although all the planned parameters are not currently able to be displayed, the structure of the individual Unit 2 display screens, the number of active parameters displayed on the screens, and the fact that the Unit 2 MCR is currently using these displays, provides reasonable assurance that the data displays will be capable of adequately supporting an emergency response for Unit 2. However, this confirmatory item will remain open since Part 2 of this item, updated dose assessment models, is not yet available for review.

OA.1.3 (Closed) Browns Ferry Lessons Learned (IP 35007)

a. Inspection Scope

In 2002, TVA endeavored to restart its Browns Ferry Unit 1 under a five-year contract award to Bechtel. In 2007, the project culminated with the restart of Unit 1, a project endeavor and restart which presented several challenges related to construction and constructability. Some of these challenges resulted in lessons learned which were carried over to the Watts Bar project oversight.

The inspectors reviewed the set of issues which the applicant identified as having occurred at Browns Ferry and for which Watts Bar was likewise potentially vulnerable. The inspectors assessed actions taken to address these issues for adequacy and overall effectiveness to date. The inspectors reviewed the underlying root and apparent cause analyses to determine whether they were of appropriate scope and detail. The inspectors sampled across the spectrum of required responses, whether programmatic, cultural, or technical to evaluate actions planned and taken. Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified. The applicant's choice to limit the scope of consideration to those issues which were categorized as level A or level B PERs (or only those requiring apparent or root causes) perhaps limited their perspective of issues of regulatory significance, as many findings identified as being of very low safety significance are routinely classified as level C PERs.

For example, had the applicant considered regulatory findings associated with Browns Ferry 1, lessons learned from NCV 05000259/2006-09-04 (T Drain on Limitorque Operator Has Been Plugged with Paint) may have led to enhanced painter training materials and could have prevented a similar issue at WB2 where a RHR 2B-B pump room cooler temperate switch was painted, resulting in its failure to calibrate properly.

c. Conclusions

Applicant actions, to the extent that they were initiated, appeared sufficient to address underlying programmatic, cultural, and technical challenges which occurred in conjunction with the licensee's recovery of Browns Ferry Unit 1.

OA.1.4 (Closed) NCV 0500391/2011604-01, Failure to Correct a Nonconformance

a. Inspection Scope

The inspectors reviewed the corrective actions associated with NCV 05000391/2010604-01, Failure to Correct a Nonconformance, and documented in PER 364388. This issue involved the inappropriate closure of PER 229082, Anchor Bolt Spacing Violation, where the applicant did not address and correct the anchor bolt spacing violation identified in PER 229082. The inspectors performed the following actions:

- Reviewed immediate actions and discussed them, along with PER closure, with corrective action program coordinator and other applicable personnel
- Reviewed the engineering evaluation and reanalysis used to accept the spacing
- Reviewed impacted documents such as drawings and design change documents to verify that applicable changes were incorporated

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that, based on the review of documentation and interviews with personnel, there is reasonable assurance that the issues associated with this NCV were adequately addressed to close this item. Based on the inspection of these items, NCV 0500391/2011604-01, Failure to Correct a Nonconformance, is closed.

OA.1.5 (Closed) NCV 05000391/2010603-05: Inadequate Corrective Actions for Non-Conforming Safety-Related Concrete**a. Inspection Scope**

The inspectors reviewed the corrective actions associated with NCV 05000391/2010603-05, Inadequate Corrective Actions for Non-Conforming Safety-Related Concrete as documented by PER 237820. This issue involved the inappropriate closure of PER 238011, Concrete Mixing and Placement Violation, where the applicant did not appropriately evaluate the installed non-conforming concrete batch as part of the corrective actions stated in PER 230811. The inspectors performed the following actions:

- Discussed details of immediate actions taken with corrective action program coordinator
- Observed concrete rework and placement associated with WO 09-954333-011 as documented in IIR 05000391/2010604, Section C.1.5, Structural Concrete – Work Observation
- Reviewed the engineering evaluation of the concrete placement
- Reviewed associated documentation including QC datasheets documenting engineering's disposition to rework the area to verify that applicable requirements were met where the non-conforming concrete was placed

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that, based on observation of rework activities, review of documentation, and interviews with personnel, there is reasonable assurance that the issues associated with this NCV have been adequately addressed. Therefore, NCV 05000391/2010603-05, Inadequate Corrective Actions for Non-Conforming Safety-Related Concrete, is closed.

OA.1.6 (Closed) NCV 2010603-04: Undersized Pipe Support Welds**a. Inspection Scope**

The inspectors reviewed corrective actions associated with PERs 219205 and 308404. These PERs addressed NCV 05000391/2010603-04, Undersized Pipe Support Welds, which involved an undersized weld on a safety-related pipe support. The inspectors reviewed the PER corrective actions to determine that the applicant adequately identified the apparent cause of the undersized weld and implemented corrective actions, including a revised training program, independent assessment of QC performance, and re-inspection of 1,173 welds that had been previously accepted by QC inspectors. The inspectors also reviewed a sample of the re-inspected welds to verify that the applicant had appropriately characterized them. Documents reviewed are listed in the attachment.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that the issues associated with NCV 05000391/2010603-04 were effectively tracked in the applicant's corrective action program and that the corrective actions implemented were adequate. Based on the inspection of these items, this NCV is closed.

OA.1.7 (Closed) Unresolved Item (URI) 391/87-13-02: Supports Installed on Non-Load-Bearing Wall

a. Inspection Scope

Background: In NRC Inspection Report Nos. 50-390/87-13 and 50-391/87-13, dated February 24, 1988, the NRC identified concerns with reinforcing steel spacing in relation to the loads being applied to the non-load bearing walls at the location of Charging Pump Room 2C for Unit 2. Hanger support connections were installed on these walls. The concern was considered unresolved pending the applicant's analysis, evaluation and corrective actions and was identified as URI 50-391/87-13-02. The applicants' analysis and evaluation identified a worst case section of the non-load bearing walls by performing walk downs of these walls and reviewing design documents. The applicant performed an engineering evaluation of the worst case section to analyze the non-load bearing walls to determine if the walls were adequate for the loads being applied. Documents reviewed are listed in the attachment.

Inspection Activities: The inspectors walked down a sample of the worst case section from the walkdown package used in the calculation. The inspectors performed the following review of the applicant's analysis, evaluation to verify that corrective actions were implemented:

- Reviewed the applicant's open item closure report PER 178014 which was used to track this open item.
- Inspected the walkdown package for the Concrete Feature Number 41N368-4/45,SW,AB to verify it was consistent with the information obtained in the field

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

Based on these actions the inspectors determined that the applicant had resolved the original construction deficiency. This item is closed.

OA.1.8 (Closed) Safety-Related Piping - QA Review (IP 49061)

a. Inspection Scope

The purpose of this IP was to determine whether technical requirements associated with safety-related piping (outside the reactor coolant system pressure boundary) have been

adequately addressed and established in the construction specification, drawings, and work procedures and whether these controls were adequate. IIR 05000391/2009602 (ML091210420), Attachment 3, documented some of these QA program reviews during a readiness inspection. In addition, inspectors performed applicable remaining portions of this IP to ensure that the applicant had adequate procedures in place.

The inspectors interviewed staff and reviewed related procedures to ensure that QA/QC requirements established by the NRC and SAR commitments for safety-related piping have been addressed. This inspection covered procedure review for the following aspects required for safety-related piping: purchase documents, material receipt, storage, handling, installation, field changes, and cleanliness. The applicant's plans and schedules for audits were reviewed. Procedure requirements for appropriate training with respect to the assigned duties were also inspected.

Portions of this IP have been previously addressed through inspection samples credited in the following inspection reports including some where IP 49063, Safety-Related Piping Work Observation, was performed:

- 05000391/2009602
- 05000391/2009603
- 05000391/2009604
- 05000391/2009605
- 05000391/2010604
- 05000391/2010602
- 05000391/2010605
- 05000391/2011602
- 05000391/2011604

The intent of this inspection effort was to perform a comprehensive review of applicant procedures in addition to those previously performed such that this IP can be closed.

Section 2.01 of this IP requires the completion of IP 35100, which was completed and documented in IIR 05000391/2009602, Attachment 3.

Section 2.02 of this IP is used to determine if appropriate and adequate procedures are included or referenced in the QA manual to ensure that specific activities pertaining to safety related piping are controlled and performed according to NRC requirements and SAR commitments relating to safety-related piping.

The following table documents the procedures reviewed relating to the criteria for each subsection in Section 2.02.

Section	Safety Related Piping Attribute	Associated Procedures
2.02.a	Purchase Documents	NPG-SPP-04.1 NEDP-8 25402-PRO-0002 25402-000-GPP-0000-N3705 25402-000-GPP-0000-N6102 25402-3DP-G06G-00001
2.02.b	Receiving Inspection	NPG-SPP-04.2 25402-000-GPP-0000-N6104

2.02.c	Storage and Issue	NPG-SPP-04.3 NPG-SPP-04.4 25402-PRO-0007 25402-000-GPP-0000-N6204
2.02.d	Handling	NPG-SPP-04.3
2.02.e	Installation	N3M-868 25402-000-GPP-0000-N3503 25402-000-GPP-0000-N3504 25402-000-GPP-0000-N3506 25402-000-GPP-0000-N3701 25402-000-GPP-0000-N3702
2.02.f	Design Changes	25402-3DP-G04-00062 25402-000-GPP-0000-N3105
2.02.g	Cleanliness	25402-000-GPP-0000-N3505

Section 02.03 requires the review of the applicant's plans and schedules to audit compliance with and effectiveness of the QA/QC requirements associated with safety-related piping, including: design, procurement, receipt/storage, installation, and testing. The inspectors reviewed audit plans to determine whether the elements needed to satisfy this requirement were scheduled.

Section 02.04 requires determination of whether the applicant management has an established program for ensuring that all personnel involved in the activities mentioned in this IP are suitably proficient, skilled or otherwise qualified by experience or training to perform their assigned duties. The inspectors verified that the applicant's training program exists to ensure compliance with the necessary requirements. Furthermore, the individual procedures which meet the requirements of Section 02.02 have explicit requirements for training or qualification necessary for individuals to carry out the respective tasks.

Section 02.05 requires, if deemed appropriate, completion of sections 02.01 and 02.02 for an expanded sample of onsite organizations having QA/QC responsibilities relative to safety-related piping. At this time the additional sampling of sections 02.01 and 02.02 are not required as the procedures and organizations sampled thus far are adequate. However, should major changes occur to the procedures or responsible organizations then further inspection may be required.

Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified.

Below is a summary of each section of IP 49061:

Section 02.01– Closed
 Section 02.02 – Closed
 Section 02.03 – Closed
 Section 02.04 – Closed
 Section 02.05 – Closed

c. Conclusions

The inspectors determined that procedures and audit material reviewed associated with safety related piping were adequate and established within quality assurance requirements. Based on initial construction inspections and recent inspection efforts, a sufficient number of samples have been reviewed in order to consider IP 49061 closed. However, if major changes to the applicant's instructions or procedures are identified through observation of future work activities associated with safety-related piping, the inspectors will inspect those as necessary to satisfy the requirements in this procedure.

OA.1.9 (Closed) Emergency Preparedness Confirmatory Item #39 (IP 71114.01)

a. Inspection Scope

Background: The confirmatory item discussed below is identified in NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplemental Safety Evaluation Report No. 22, Section 13.3.2.6, "Emergency Communications."

The NRC staff will confirm the adequacy of communications capability to support dual unit operations prior to issuance of the Unit 2 OL

The scope of the present review is based on the Section 13.3, "Emergency Preparedness," of the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition," NUREG-0800. The SRP provides:

In general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate.

This protocol applies to this inspection in that the Watts Bar Radiological Emergency Plan (WBN REP) was written as a site-wide plan and that TVA proposed, and the Commission accepted, a regulatory framework in which TVA would align the Unit 1 and Unit 2 licensing and design basis to ensure design and operational fidelity between the two units. The adequacy of the WBN REP has been confirmed by the routine NRC inspection oversight, and TVA's performance in biennial exercises conducted since the licensing of Unit 1 in 1996.

Inspection Activities: The review of the WBN REP for Unit 2, and this inspection, focused on differences between the two units, and any dual-unit issues that would be created by the licensing of Unit 2. The inspectors toured the main control room (MCR), the TSC, and the OSC with licensee/applicant personnel with a focus on adequacy of communications capability provided for Unit 1 to support a Unit 2 response following startup.

b. Observations and Findings

No findings of significance were identified. For the MCR, Watts Bar has a combined control room with each unit's controls located at opposite ends of the MCR and a

common shift manager station located between these two ends. The emergency response communication equipment is located at the shift manager's station. As such, an emergency response for Unit 2 would use the same communication equipment as is currently used by Unit 1, and that were previously found to be acceptable by the NRC. The TSC and OSC were observed to have the communications capabilities currently used by Unit 1 and that were previously found to be acceptable by the NRC. An emergency response for Unit 2 would use the same facilities and communication equipment as is currently used by Unit 1.

In addition to the communications capabilities observed at the WBN site, the inspectors observed the October 19, 2011, WBN Unit 1 exercise from the CECC. This facility currently serves all TVA Nuclear sites and was previously found to be acceptable by the NRC. In observing the exercise in the CECC the inspectors did not observe any situation that would suggest the current communications capabilities of the CECC could not adequately support an emergency response involving Unit 2.

c. Conclusions

In accordance with the protocol for this inspection, and based on the preceding discussion, the inspectors finds, with reasonable assurance, that the communications capability to support an emergency response at Unit 2 will be adequate. Accordingly, Confirmatory Item #39 can be closed. The communication capability associated with Item #39 will remain subject to routine NRC inspection oversight.

OA.1.10 (Closed) Emergency Preparedness Confirmatory Item #42 (IP 71114.01)

a. Inspection Scope

Background: The confirmatory item discussed below is identified in NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplemental Safety Evaluation Report No. 22, Section 13.3.2.9, "Emergency Communications."

The NRC staff will confirm the adequacy of the accident assessment capabilities to support dual unit operations prior to the issuance of the Unit 2 OL

The scope of the present review is based on the Section 13.3, "Emergency Preparedness," of the "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition," NUREG-0800. The SRP provides:

In general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate.

This protocol applies to this inspection in that the WBN REP was written as a site-wide plan and that TVA proposed, and the Commission accepted, a regulatory framework in which TVA would align the Unit 1 and Unit 2 licensing and design basis to ensure design and operational fidelity between the two units. The adequacy of the WBN REP has been

confirmed by the routine NRC inspection oversight, and TVA's performance in biennial exercises conducted since the licensing of Unit 1 in 1996.

This Confirmatory item was generated in response to an applicant response to a staff request for additional information regarding the capability of the WBN ERFs to simultaneously handle an emergency event affecting both WBN Unit 1 and Unit 2 (e.g., events initiated by loss of power, earthquake, tornado, flooding, or hostile actions). This item differs from Confirmatory Item #41 in that the ability for simultaneous response is of interest rather than whether the Unit 2 data are available.

Inspection Activities: The inspectors evaluated the status of the plant data display updates to include Unit 2.

b. Observations and Findings

No findings of significance were identified. The instrumentation displays in the MCR are specific to each unit and independent of each other. The data displays in the WBN ERFs are driven by the Plant Engineering Data System (PEDS), which serves as an interface to the plant data on the plant's Integrated Computer System (ICS). The data was displayed on personal computers (PCs) through user-selectable menu options. As such, any PC can access data from Unit 1, Unit 2, or the simulator. The TSC has several PCs that have access to the data, by menu and icon selection, necessary for the individual workstations and functional areas (i.e., ERO positions). In addition, there are wall mounted large LCD screens that clone the display on the individual attached PCs. A similar configuration exists in the OSC with fewer displays and PCs. ICS and PEDS displays are also available within the MCR. The licensee EP staff demonstrated the PEDS data displays for Unit 2 in the TSC. All of the data screens available for Unit 1 were available for Unit 2 and were online and active.

The CECC has seven display screens projected onto a large projection screen in the central CECC area. As with the configuration in the TSC and OSC, these screens are driven by individual PCs. These display screens are selectable as menu options on the associated PC and included PEDS, radiological assessment team and plant assessment team status summaries, a protective action plot, and selected WebEOC™ pages. The majority of the PCs in the CECC had dual monitors allowing multiple displays. Although no Unit 2 screens were displayed during the recent exercise on October 19, 2011, which the inspectors observed, the capability would have been available given the PEDS configuration.

c. Conclusions

Although all planned parameters are not currently able to be displayed, the structure of the individual display screens, the number of display screens available, and the ability of the end user to select which data from which unit are to be displayed, provide reasonable assurance that the data displays will be capable of adequately supporting an emergency response for both Unit 1 and Unit 2 simultaneously. Accordingly, Confirmatory Item #42 can be closed.

OA.1.11 (Closed) CDR 391/83-47: Lugs Welded to Spiral Welded Pipe (IP 50100)

This item was reviewed and closed in IIR 2011608, section OA.1.29; however, the reference number for the CDR was incorrect. This is to document the correct CDR number and proper closure of this item.

V. MANAGEMENT MEETINGS**X.1 Exit Meeting Summary**

On December 2, 2011, the resident inspectors presented the inspection results to Mr. Gordon Arent 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.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

D. Stinson, Site Vice President, TVA, Unit 2
 G. Scott, TVA Licensing
 C. Stephenson, TVA Licensing
 D. Beckley, Electrical Design, TVA Unit 2
 D. Charlton, Licensing, TVA, Unit 2
 W. Crouch, TVA Licensing

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction
IP 37002	Construction Refurbishment Process – Watts Bar Unit 2
IP 46071	Concrete Expansion Anchors
IP 49061	Safety-Related Piping – QA Review
IP 49063	Piping - Work Observation
IP 50073	Mechanical Components – Work Observation
IP 50090	Pipe Support and Restrain Systems
IP 51053	Electrical Components and Systems - Work Observation
IP 51063	Electric Cable – Work Observation
IP 64051	Procedures – Fire Prevention/Protection
TI 2512/022	Inspection of Watts Bar Nuclear Plant Fire Protection Corrective Action Program Plan
TI 2512/023	Inspection of Watts Bar Nuclear Plant Hanger Update Corrective Action Program Plan

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000391/2011609-01	NCV	Failure to Perform Layup and Preventative Maintenance on Safety-Related Components (Section C.1.6)
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Discussed

391/85-26	CDR	Failure of Coatings on Containment Vessel Interior (Section OA.1.1)
Open Item 41	SSER 22 (App HH)	Review Plant Data Displays and Updated Dose Assessment Models (Section OA.1.2)

Closed

46071	IP	Concrete Expansion Anchors (Section C.1.8)
05000391/2011604-01	NCV	Failure to Correct a Nonconformance (Section OA.1.4)

05000391/2010603-05	NCV	Inadequate Corrective Actions for Non-Conforming Safety-Related Concrete (Section OA.1.5)
05000391/2010603-04	NCV	Undersized Pipe Support Welds (Section OA.1.6)
391/87-13-02	URI	Supports Installed on Non-Load-Bearing Wall (Section OA.1.7)
49061	IP	Safety-Related Piping – QA Review (Section OA.1.8)
Open Item 39	SSER 22 (App HH)	Communications Capability to Support Dual Unit Operations (Section OA.1.9)
Open Item 42	SSER 22 (App HH)	Review Accident Assessment Capabilities to Support Dual Unit Operations (Section OA.1.10)
391/83-47	CDR	Lugs Welded to Spiral Welded Pipe (Section OA.1.11)

LIST OF DOCUMENTS REVIEWED

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1.2 Electrical Components – Work Observation and Construction Refurbishment Process (IPs 51053 and 37002)

Miscellaneous

Part 21 Notification 2011-39-00, Potential Defects in Qualtech NP Safety Related Motor Control Center Buckets (ML11214A209), 07/15/2011

PER 382988, Adverse Trend – Failure of MCC Bucket “Power-On-Light” Transformers, 06/06/2011

WO 112704132, PER 382988 Sys 030 232 WBN-2-MCC-232-B Replacement of Light Transformer

C.1.3 Pipe Support and Restraint Systems (IP 50090, 35020 and TI 2512/023)

Bechtel Procedures

25402-MGT-0002, Training, Rev. 10

25402-QAS-0002, Quality Assurance Surveillance, Rev. 3

25402-000-GPP-0000-N1206, Work Order Processing, Rev. 13

25402-000-GPP-0000-N3105, Field Change request, Rev. 13

25402-3DP-G04G-00081, Engineering Document Construction Release, Rev. 10

25402-QAS-0003, Project Quality Assurance Audits and Audit Personnel Qualifications, Rev. 5

TVA Procedures

NGDC PP-14, “Audits and Assessments,” Rev. 4

NGDC PP-21, “Training and Qualification of Quality Assurance Personnel,” Rev. 3

QAPD-2, “Internal Audits,” Rev. 4

QAPD-7, “Quality Assurance Training and Qualification Program Description,” Rev. 2

PERs and SRs

PER 250875, “Hardware Discrepancies Associated with INSTV EDCR 52566,” 9/14/10

PER 253792, “INSTV EDCR 52566 Pipe Support/Isometric DRA Issues,” 9/20/10

PER 357920, “System 67 WO 112053646 Issues,” 4/20/11

Audit Reports

25402-WBN-AR-10-0004, “Design Control: August 12, 2010 through September 9, 2010,” Rev. 0

25402-WBN-AR-11-0001, “Training: February 7, 2011 through March 11, 2011,” Rev. 0

25402-WBN-AR-11-0002, “Corrective Action and Nonconformances: March 21, 2011 through April 22, 2011,” Rev. 0

25402-WBN-SR-10-1381, “Anchor Bolt Installation Training Observation,” 11/11/10

25402-WBN-SR-11-1690, “System 070 Quality Related Pipe Supports,” 4/19/11

25402-WBN-SR-11-1749, “Wedge Bolt Installation Activities,” 5/23/11

25402-WBN-SR-11-1812, “Modification to System 063 Pipe Support,” 6/24/11

25402-WBN-SR-11-1835, “Completed System 074 Safety Related Pipe Support,” 7/14/11

NGDC-WB-11-004, “Effectiveness of QA Program Elements Applicable to the I&E Bulletin 79-14 Walkdowns,” 4/15/11

WO Packages

WO 10-951295-003 Modify/Install Supports
 WO 09-954408-005 Modify/Install Supports
 WO 10-951376-001 Modify/Install Supports

Engineering Document Construction Release (EDCR)

52507 Modification of pipe supports of Essential Raw Cooling Water (ERCW)
 52506A Modification of pipe supports of (ERCW)
 52504 Modification of pipe supports of (ERCW)

Field Change Requests

FCR 58165
 FCR 57735
 FCR 56974
 FCR 57282
 FCR 58242
 FCR 56956A
 FCR 56090A
 FCR 57488A
 FCR 57626A
 FCR 57455A
 FCR 57483A

Calculations

Pipe Support Calculation Number 47A45025400, Rev. 001

Supports Identification Number

47A450-25-252, (Modified pipe support)
 47A450-25-145, (Modified pipe support)
 47A450-25-400, (Newly installed pipe support)

Miscellaneous

Memo from D. Kozich to Records, "Completed Project Quality Assurance Master Audit
 Schedule – 2010," 2/3/11
 WFMIC-010, Inactive Weld Issue Material Issue Code
 CMTR 551791
 TVA Oversight Results, "New and Modified Supports," 5/12/11
 TVA Oversight Results, "Implementation of 79-14," 3/12/11

List of Pipe Support Inspected:

Pipe Support Identification Number	Drawing Revision Authorization	Support Type
2-74-001	52535-045, Rev. 0, 52535-046, Rev. 1, 52535-047, Rev. 0	Component Support
2-70-171	52528-041, Rev. 0, 52528-042, Rev. 0, 52528-043, Rev. 0	Component Support
2-74-024	52535-003, Rev. 0, 52535-	Component Support

	002, Rev. 0	
74-2RHR-R170	52540-058, Rev. 1	Component Support
74-2RHR-R171	52540-060, Rev. 0	Component Support
74-2RHR-R172	52540-057, Rev. 1	Component Support
47A450-31-41, and 47A450-25-38	52504-017, Rev. 0, 52504-019, Rev. 0	Multiple Pipe Supports
47A450-25-225, and 47A450-25-407	52505-005, Rev. 1, 52505-006, Rev. 2, 52505-005, Rev. 1	Multiple Pipe Supports
74-2RHRR063-1	52538-160, Rev. 0, 52538-161, Rev. 0	Component Support
70-2CCR009-1	52531-006, Rev. 0	Component Support
47A450-25-238, and 47A450-25-413	52507-110, Rev. 0, 52507-111, Rev. 0, 52507-112, Rev. 0, 52507-069, Rev. 1	Multiple Pipe Supports
47A450-25-347, and 47A450-25-348	52508-022, Rev. 0, 52508-023, Rev. 0, 52508-024, Rev. 0, 52509-017, Rev. 0, SK-47A450-25-347A	Multiple Pipe Supports
47A450-25-411, and 47A450-25-412	52507-091, Rev. 0, 52507-095, Rev. 0, 52507-096, Rev. 0	Multiple Pipe Supports

C.1.4 Piping – Work Observation (IPs 49063 and 37002)

WO Packages

WO 111617727, CCH Sys 070 WBN-2-PIPE-070-C Pressure Test 2-070-HYDRO-B004
 WO 111617876, CCH Sys 070 WBN-2-PIPE-070-C Pressure Test 2-070-HYDRO-B005
 WO 111619039, CCH Sys 070 WBN-2-PIPE-070-C Pressure Test 2-070-HYDRO-B011
 WO 112309656, Temporary Spool Piece Strainer, RHR Pump 2A-A

Miscellaneous

IN 85-96, Temporary Strainers Left Installed in Pump Suction Piping
 2-47W810-1, Flow Diagram U2 Residual Heat Removal System, Rev. 5
 2-CP-074-01, System 074 Residual Heat Removal Cleaness Plan, Draft

C.1.6 Mechanical Components – Work Observation (IP 51073)

Procedures and Specifications

System/Component Layout, 25402-000-GFP-000-N1304, Rev 1
 25402-011-V1A-MG00-04575-002 Containment Spray Heat Exchanger Bundle and Shell
 Storage and Special Handling Procedure

Vendor Documents

Instruction Manual for Containment Spray Pumps and Drivers, Contract 54114-1, VTM W120-0050, VTD-W120-0060
 Babcock and Wilcox Canada Ltd., Drawings 71-600-186 Pump Assembly and F-SP 21861 John Crane Seal Assembly

Work Orders

08-953047-000, Disassembly, inspection, and reassembly of the 2A-A Containment Spray Pump

08-953058-000, Disassembly, inspection, and reassembly of the 2B-B Containment Spray Pump
 08-955318-002, Installation of Terry Turbine

Performance Evaluation Reports

444516, Layup PM's have not been initiated nor performed on the Unit 2 Containment Spray Pumps as required by 2504-000-GPP-0000-N1304

Service Requests

469516, Containment Spray Pump Vendor Manual Storage Recommendation

C.1.7 Coatings (IP 37002)

Miscellaneous

MAI-5.3 Rev. 18 – Protective Coatings

G-55 Rev. 18 – Technical and Programmatic Requirements for the Protective Coating Program for TVA Nuclear Plants

25402-000-GPP-0000-N6204 Rev 13 – Field Material Control and Traceability

T.1.1 Engineering Organization Training (IP 35960)

Miscellaneous

TVA General Engineering Specification G-98, Installation, Modification and Maintenance of Electrical Raceway Fire Barrier Systems, Revision 5, dated 12/17/97

Transco Products Inc. Field Manual WBN-001, Rev. 0

Drawings

0-47W243-1, Thermo-Lag 330-1 Single Layer Design for Conduits 4" and Larger

0-47W243-2, Thermo-Lag 330-1 Two Layer Design for Conduits 3" and Smaller

0-47W243-3, Thermo-Lag 330-1 Junction Boxes

0-47W243-4, Thermo-Lag 330-1 18" Cable Trays

0-47W243-5, Thermo-Lag 330-1 Miscellaneous Details

0-47W243-18, Thermo-Lag 330-1 Miscellaneous Details

III. OPERATIONAL READINESS ACTIVITIES

F.1 Fire Protection (IP 64051)

Miscellaneous

SPP-10.9, Control of Fire Protection Impairments, Rev. 5

SPP-10.10, Control of Transient Combustibles, Rev. 6

NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work), Rev. 0

25402-000-GPP-0000-N1207, Work Order Permits, Rev. 2

TI-12.08, Control of Unit Interfaces, Rev. 8

TI-404, Unit 2 Separation During Construction, Rev. 5

IV. OTHER ACTIVITIES

OA.1.1 Construction Deficiency Report (CDR) 391/85-26: Failure of Coatings on Containment Vessel Interior (IP 37002)

Problem Evaluation Reports

PER 172633, Tracking of Historic NCR 6144

PER 227383, Historic Coatings Issues

Work Orders

WO110921696, Visual Examination of the U2 Primary Containment Interior

Calculations

ALION-CAL-TVA-2739-03 Revision 4, Watts Bar Reactor Building GSI-191 Debris Generation Calculation

Specifications and Procedures

General Engineering Specification G-55, Technical and Programmatic Requirements for the Protective Coating Program for TVA Nuclear Plants

TVA Watts Bar Nuclear Unit 2 Construction Completion Project Procedure 25402-000-GPP-000-N3222, Field Painting and Coating

Watts Bar Nuclear Unit 0 Modification/Addition Instruction MAI-5.3, Protective Coatings

Miscellaneous

Final Report for Failure of Coating on Containment Vessel Interior- WBRD-50-391/85-26, dated August 21, 1985

OA.1.3 Browns Ferry Lessons Learned (IP 35007)

PERs

145142, Changes in Time-Current Clearing Curves, 5/14/2008

153545, WBN2 Generic Review of BFN Restart RCAs, 9/30/2008

154005, BFN Procedure Found in U2 Work Order, 10/6/2008

156414, Generic Review of BFN PER 149850 – Code Class 2 Piping Leak Results in Unit 1 Shutdown, 11/5/2008

161351, Generic Review of BFN PER 158574 – RCIC Turbine Oil High OOS Particulate, 1/20/2009

164285, Generic Review of BFN PER 153183 – Reactor Recirc Pump Seal Pressure Drop Due to Likely Leak, 2/24/2009

168454, Generic Review of BFN PER 157777 – BFN Restart MOV Problems, 4/13/2009

173289, Generic Review of BFN PER 164401 – Lack of Procedural Controls Results in Failure to Account for Thermal Growth Affecting Reactor Recirc Pump, 6/8/2009

200704, Address Issues Identified in BFN PER 129791, Actions 016, 026, 027, and 046, 8/31/2009

207030, Address Issues Identified in BFN PER 137614, Actions 040 and 041, 11/4/2009

349638, BFN NOER-11-015, Rigging Equipment Failure, 4/4/2011

451184, Paint On and Affecting 2-TS-30-176 in 2B-B RHR Pump Room, 10/20/2011

OA.1.4 NCV 05000391/2011604-01, Failure to Correct a Nonconformance

Miscellaneous

PER 229082, Anchor bolt spacing violation

WO 09-952202-011, Fabricate and Install Pipe Support 2-47A465-247

EDCR# 53123, Pipe Support Modifications on (System 068) Reactor Coolant System

T95100730001, Calculation for Pipe Support No. 2-47A465-247

OA.1.5 NCV 05000391/2010603-05: Inadequate Corrective Actions for Non-Conforming Safety-Related Concrete

PERs

230811, Concrete Mixing and Placement Violations
 237820, PER 230811 has been inappropriately closed

WO

09-954333-011, Repair of conduit sleeve WBN-0-SLV-304-A16132 A/B

OA.1.6 Electrical Issues CAP – Sub-issue: Cable Separation and Electrical Isolation (IP 51063)

PERs

219205, Undersized Weld
 308404, ASME related welds in need of construction action

OA.1.7 URI 391/87-13-02: Supports Installed on Non-Load-Bearing Wall

Miscellaneous

WCG-1-585 Worst Case Concrete Feature Selection, Rev. 3
 WCG-1-741 Worst Case Concrete Feature Selection of Shield Walls, Rev1
 WCG-1-951 Evaluation of Worst Case Concrete Shield Walls, Rev. 3
 Technical Instruction TI-206 Documentation and Evaluation for Attachments to Civil Features, Rev. 2
 WGC-1-1472 Document Acceptance of All Unit 2 Category 1 Concrete Building Features (Excluding Reactor Building)
 EAI-8.07 Documentation and Evaluation for Attachments to Civil Features
 Building Code Requirements for Reinforced Concrete ACI 318-77
 Commentary on Building Code Requirements for Reinforced Concrete ACI 318-77

OA.1.8 Safety-Related Piping - QA Review (IP 49061)

Procedures

NPG-SPP-04.1 "Procurement of Material, Labor and Services" (2.02.a)
 NPG-SPP-04.2 "Material Receipt and Inspection" (2.02.b)
 NPG-SPP-04.3 "Material Storage and Handling," Rev. 1 (2.02.c, 2.02.d)
 NPG-SPP-04.4 "Material Issue, Control and Return" (2.02.c)
 NEDP-8 "Technical Evaluation for Procurement of Materials and Services" (2.02.a)
 25402-PRO-0002, "Purchase Order Formation" (2.02.a), Rev 4
 25402-PRO-0007, "Field Material Storage Control" (2.02.c), Rev 3
 25402-000-GPP-0000-N1302, "Watts Bar Unit 2 Completion project Refurbishment Evaluation"
 25402-000-GPP-0000-N3503, "Piping Installation" (2.02.e)
 25402-000-GPP-0000-N3504, "Pipe and Instrument Tubing Supports" (2.02.e)
 25402-000-GPP-0000-N3505, "Piping System Cleanliness" (2.02.g)
 25402-000-GPP-0000-N3506, "Pressure Testing of Piping, Tubing and Components" (2.02.e)
 25402-000-GPP-0000-N3701, "Welding Program" (2.02.e)
 25402-000-GPP-0000-N3702, "Arc Strike removal/Base Metal Repair of Piping" (2.02.e)
 25402-000-GPP-0000-N3705, "Welding & NDE Documentation and Records Management" (2.02.a)
 25402-000-GPP-0000-N6102, "Field Material Requisition and Purchasing" (2.02.a)
 25402-3DP-G06G-00001, "Materials Requisitions" (2.02.a)
 25402-000-GPP-0000-N6104, "Material Receiving" (2.02.b)
 25402-000-GPP-0000-N6204, "Field Material Control and Traceability" (2.02.c)
 25402-3DP-G04-00062, "Field Change Requests" (2.02.f)
 25402-000-GPP-N3105, "Field Change Requests" (2.02.f)

Audit Documents

2010 PMAS r2 8-3-10 (2.02.03)

2011 PMAS r2 5-24-11 (2.02.03)

25402-WBN-AR-11-0003 (2.02.03)

25402-WBN-AR-11-0005 (2.02.03)

LIST OF ACRONYMS

BL	Bulletin
CAP	Corrective Action Program
CCS	component cooling water
CDR	Construction Deficiency Report
CFR	Code of Federal Regulations
CSL	coating service level
ECP	Employee Concerns Program
GL	Generic Letter
HAAUP	Hanger Analysis and Update Program
ICS	integrated computer system
IIR	Integrated Inspection Report
IMC	Inspection Manual Chapter
IP	Inspection Procedure (NRC)
LUPM	layup and preventive maintenance
MCC	motor control center
MCR	main control room
NCR	non-conformance report
NCV	non-cited violation
NDE	Nondestructive Examination
NRC	Nuclear Regulatory Commission
OSC	Operations Support Center
PC	personal computer
PEDS	Plant Engineering Data System
PER	Problem Evaluation Report
PMF	probable maximum flood
QA	quality assurance
QC	quality control
REP	radiological emergency plan
REV.	revision
RHR	residual heat removal
SAR	Safety Analysis Report
SL	severity level
SP	Special Program
SRP	Standard Review Plan
SSER	Supplemental Safety Evaluation Report
TBB	thermal barrier booster
TI	Temporary Instruction
TSC	Technical Support Center
TVA	Tennessee Valley Authority
URI	Unresolved Item
VTD	vendor technical document
WBN	Watts Bar Nuclear Plant
WO	work order