UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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February 13, 2015

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

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2014615

Dear Mr. Skaggs:

On December 31, 2014, 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 January 22, 2015, with you 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, the conditions of your construction permit, and fulfillment of Unit 2 regulatory framework commitments. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings were identified during this inspection.

In accordance with 10 *Code of Federal Regulations* (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 website 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/

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

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

Enclosure: Inspection Report 05000391/2014615
w/ Attachment

cc w/encl: (See next page)

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Letter to Michael D. Skaggs from Robert C. Haag dated February 13, 2015.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2014615

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-391
Construction Permit No.:	CPPR-92
Report No.:	05000391/2014615
Applicant:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Unit 2
Location:	Spring City, TN 37381
Dates:	November 16, 2014 – December 31, 2014
Inspectors:	T. Nazario, Senior Resident Inspector, Construction Projects Branch (CPB) 3, Division of Construction Projects (DCP), Region II (RII) R. Monk, Senior Resident Inspector, CPB3, DCP, RII E. Patterson, Resident Inspector, CPB3, DCP, RII N. Karlovich, Resident Inspector, CPB3, DCP, RII M. Magyar, Resident Inspector, CPB3, DCP, RII C. Cheung, Construction Project Inspector, CPB2, DCP, RII D. Piccirillo, Senior Construction Project Inspector, CPB2, DCP, RII J. Baptist, Senior Construction Project Inspector, CPB3, DCP, RII, Sections P.1.3 and P.1.5, and P.1.7 J. Seat, Construction Project Inspector, CPB3, DCP, RII, Sections P.1.4 and P.1.6 R. Hamilton, Senior Health Physicist, Plant Support Branch (PSB) 1, Division of Reactor Safety (DRS), RII, Sections CH.1.1 and CH.1.2 R. Kellner, Health Physicist, PSB1, DRS, RII, Sections CH.1.1 and CH.1.2 C. Jones, Senior Construction Inspector, Construction Inspection Branch 1 (CIB1), Division of Construction Inspection (DCI), RII, Section P.1.2 C. Julian, Senior Project Manager, CIB1, DCI, RII, Sections P.1.2, OA.1.3, OA.1.4, and OA.1.5 D. Terry-Ward, Construction Inspector, CIB1, DCI, Section P.1.2 A. Matos-Marin, Construction Inspector, CIB1, DCI, Section P.1.2 L. Castelli, Senior Construction Inspector, CIB1, DCI, Sections OA.1.3, OA.1.4, and OA.1.5 R. Mathis, Construction Inspector, CIB1, DCI, Sections OA.1.3, OA.1.4, and OA.1.5 T.C. Su, Reactor Inspector, Engineering Branch 1, DRS, Sections OA.1.3, OA.1.4, and OA.1.5 J. Lizardi, Construction Inspector, CIB2, DCI, Sections OA.1.6 and OA.1.7

Enclosure

S. Smith, Senior Construction Inspector, CIB2, DCI, Section OA.1.7
J. Christensen, Construction Inspector, CIB3, DCI, Section OA.1.7

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 (QA), identification and resolution of construction problems, engineering and construction activities, preoperational testing, and follow-up of other activities. The inspection program for Unit 2 construction activities is described in Nuclear Regulatory Commission (NRC) Inspection Manual Chapter (IMC) 2517, "Watts Bar Unit 2 Construction Inspection Program." 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

- The inspectors concluded that issues pertaining to several open items, including eight inspection procedures (IPs), two construction deficiency reports (CDRs), one temporary instruction (TI), and two supplemental safety evaluation report (SSER) Appendix HH items have been appropriately addressed for WBN Unit 2. These items are closed.

- Other areas inspected were adequate with no findings identified. These areas included QA; piping; mechanical components; electrical systems and components; environmental qualification special program; preoperational testing activities; and various NRC inspection procedures.

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REPORT DETAILS

Summary of Plant Status

During the inspection period covered by this report, TVA performed construction completion and preoperational testing activities on safety-related systems and continued engineering design activities of the WBN Plant, Unit 2 (U2).

I. QUALITY ASSURANCE PROGRAM

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

a. Inspection Scope

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 specifically reviewed and followed up on the corrective actions of several PERs discussed throughout sections of this report.

b. Observations and Findings

No findings were identified.

c. Conclusions

The issues identified in the PERs reviewed were adequately identified, addressed, and resolved.

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

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

a. Inspection Scope

The inspectors independently assessed applicant controls, associated with Unit 2 construction work activities, to prevent adverse impact 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, at least once per week, 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 select work activities, which the applicant had screened as not affecting Unit 1, to verify the adequacy of that screening effort. Additionally, the inspectors independently assessed select 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 select construction work locations to verify that controls to protect the operating unit provided an adequate level of protection and had been properly implemented. Some inspection samples associated with Unit 1 and Unit 2 interface activities that occurred during the 4th quarter of 2014 were also documented in Section C.1.1 of Integrated Inspection Report (IIR) 05000391/2014614 (Agencywide Documents Access and Management System [ADAMS] Accession Number [No.] ML14363A315).

Specific work activities observed included work associated with:

- Work order (WO) 115447254, System 070, CCS B Train Flow Balance, 2-PTI-070-02B
- WO 115447920, System 061, Ice Condenser System Test, 2-PTI-061-01

Specific work activities that the applicant had screened out as not affecting Unit 1 included, but were not limited to, work activities as noted in this inspection report.

b. Observations and Findings

No findings were identified.

c. Conclusions

Overall, management oversight and controls were in place for observed construction activities that could potentially impact the operating unit.

C.1.2 (Closed) Reactor Coolant Pressure Boundary Piping – Work Observation (Inspection Procedure 49053)

a. Inspection Scope

Background: As described in NRC's Inspection Manual Chapter (IMC) 2517, TVA addressed WBN Unit 1 construction quality issues as part of the implementation of its Nuclear Performance Plan (NPP). The results of the NRC inspection program were published in NUREG-1528, "Reconstitution of the IMC 2512 Construction Inspection Program for Watts Bar Unit 1." In 1985, construction on Watts Bar Unit 1 and Watts Bar Unit 2 was stopped due to the identification of multiple construction QA issues. TVA completed Unit 1 in 1995 but had conducted very little Unit 2-specific work since 1985. In 2007, TVA decided to finish the Unit 2. As part of confirming that all issues and inspection requirements would be completed for Unit 2, a review of all NRC inspection reports was initiated to determine the status of the required inspection procedures (IPs), contained in NRC IMC 2512, in effect at the time construction was stopped. This effort was called the reconstitution process. The NRC used the results of the reconstitution process to identify areas which would require additional inspections. Integrated inspection report (IIR) 5000391/2009602 (Agencywide Documents Access and Management System (ADAMS) Accession Number (No.) ML091210420), Attachment 2, documented the reconstitution results for IP 49053 and determined that the requirements of the IP were met for Unit 2; in addition, new reactor pressure boundary piping work or activities performed in areas covered by IP 49053 would be inspected. The majority of the reactor coolant pressure boundary piping work activities were completed and inspected prior to Unit 2 construction reactivation in 2007. The

inspection scope for new work included a sample of weld repairs, cleanliness, sensing line, and instrument line work activities.

Additionally, an earlier status of IP 49053 was documented in Section C.1.6 of IIR 05000391/2013607 (ADAMS Accession No. ML13273A512). This status documented two attributes that remained open, specifically Sections 02.04 and 02.05.

Inspection Activities: This section contains a summary of the work performed by the inspectors to review installation activities to verify that those installation activities were accomplished in accordance with regulations. The purpose of this IP was to verify, by observation of various installation activities and records review, that requirements were met for reactor coolant pressure boundary piping. This IP included handling, protection, installation, cutting, grinding, bending, supporting, cleaning and flushing, quality-related inspections, inspector qualification, heat treatment, control of nonconforming items, as-built confirmation, and record keeping, as applicable. The following table lists the inspections that were performed under this IP.

IP Section	Inspection Report
02.01 Piping Activity Observation	Section C.1.7 of IIR 05000391/2010604 ADAMS Accession No. ML103060240 Section C.1.8 of IIR 05000391/2010605 ADAMS Accession No. ML110410680 Section C.1.4 of IIR 05000391/2012602 ADAMS Accession No. ML12087A324 Section C.1.3 of IIR 05000391/2012607 ADAMS Accession No. ML12276A028
02.02 Semiannual Piping Activity Observation	Section C.1.5 of IIR 05000391/2010602 ADAMS Accession No. ML101230144 Section C.1.7 of IIR 05000391/2010604 Section C.1.8 of IIR 05000391/2010605 Section C.1.4 of IIR 05000391/2013604 ADAMS Accession No. ML13179A079 Section C.1.2 of IIR 05000391/2013607 ADAMS Accession No. ML13273A512
02.03 Piping Activities meet Procedure Requirements	Section C.1.8 of IIR 05000391/2010603 ADAMS Accession No. ML102170465 Section C.1.7 of IIR 05000391/2010604 Section C.1.8 of IIR 05000391/2010605 Section C.1.3 of IIR 05000391/2012607 Section C.1.4 of IIR 05000391/2013604

Section 2.04 and Section 02.05 of this IP was used to determine if the major components within the reactor coolant pressure boundary were completed as specified and to compare the as-built/final design drawings with the actual reactor coolant pressure boundary piping installation. The reconstitution determined the as-built inspection samples were met; however, additional inspections were performed of as-built portions of the reactor coolant system (RCS) under IP 37051, As-Built, and documented in Section C.1.6 of IIR 05000391/2014608 (ADAMS Accession No. ML14322A182).

Section 02.06 of this IP allowed for additional inspections based on the results of the old Systematic Assessment of Licensee Performance (SALP) program. The SALP program

is no longer in use. There is now a different process used for determining the need for additional inspections. This section was determined to be closed as no need for additional inspections has been identified for this area. If additional inspections are determined to be needed, then this section and procedure will be reopened.

Section 02.07 of this IP allowed for additional inspections based on the results of the old SALP program. The SALP program is no longer in use. There is now a different process used for determining the need for additional inspections. This section was determined to be closed, as no need for additional inspections were identified for this area. If additional inspections are determined to be needed, then this section and procedure will be reopened.

b. Observations and Findings

No findings were identified.

Below is a summary of each section of IP 49053:

- Section 02.01 – Complete
- Section 02.02 - Complete
- Section 02.03 – Complete
- Section 02.04 - Complete
- Section 02.05 - Complete
- Section 02.06 - Complete
- Section 02.07 - Complete

c. Conclusion

The inspectors determined that the work observations, procedures, and records associated with the reactor coolant pressure boundary piping met the applicable requirements. IP 49053 is considered closed.

C.1.3 (Closed) Mechanical Components – Work Observation (Inspection Procedure 50073)

a. Inspection Scope

Background: As described in IMC 2517, TVA addressed WBN Unit 1 construction quality issues as part of the implementation of its NPP. The results of the NRC inspection program were published in NUREG-1528, "Reconstitution of the IMC 2512 Construction Inspection Program for Watts Bar Unit 1." In 1985, construction on Watts Bar Unit 1 and Watts Bar Unit 2 was stopped due to the identification of multiple construction QA issues. TVA completed Unit 1 in 1995 but had conducted very little Unit 2-specific work since 1985. In 2007, TVA decided to finish the Unit 2. As part of confirming that all issues and inspection requirements will be completed for Unit 2, a review of all NRC inspection reports was initiated to determine the status of the required IPs, contained in NRC IMC 2512, in effect at the time construction was stopped. This effort was called the reconstitution process. The NRC used the results of the reconstitution process to identify areas which require additional inspections. IIR 5000391/2009602 (ADAMS Accession No. ML091210420), Attachment 2, documented the reconstitution results for IP 50073 and determined that the requirements of the IP

were met for Unit 2 except the following attributes: (1) storage, handling, and protection for four safety-related components and two motor-operated valves, (2) as-built inspections for 12 components. In addition, a sample of new mechanical component work or activities performed in areas covered by IP 50073 would be inspected. The majority of the reactor coolant pressure boundary and safety-related mechanical component work activities were completed and inspected prior to Unit 2 construction reactivation in 2007. The inspection scope for new work included a sample of storage, handling, protection, refurbishment, reinstallation, and as-built activities.

Inspection Activities: This section contains a summary of the work performed by the inspectors to review installation activities to verify that those installation activities were accomplished in accordance with regulations. The purpose of this IP was to verify, by observation and independent evaluation of work performed and completed to determine that activities related to safety-related components (other than the reactor pressure vessel and piping) were accomplished in accordance with NRC requirements, commitments, and the applicant's procedures. The following table lists the inspections that were performed under this IP.

Portions of this IP have been previously addressed through inspection samples credited in the following inspection reports:

- 05000391/2009602, Attachment 2 (ADAMS Accession No. ML091210420)
- 05000391/2009604, Section C.1.7 (ADAMS Accession No. ML093030479)
- 05000391/2009605, Section C.1.3 (ADAMS Accession No. ML100290703)
- 05000391/2010602, Section C.1.6 (ADAMS Accession No. ML101230144)
- 05000391/2010604, Section C.1.10 (ADAMS Accession No. ML103060240)
- 05000391/2010605, Sections C.1.2 & C.1.11 (ADAMS Accession No. ML110410680)
- 05000391/2011603, Section C.1.11 (ADAMS Accession No. ML111370702)
- 05000391/2011605, Section C.1.4 (ADAMS Accession No. ML112201418)
- 05000391/2011607, Section OA.1.6 (ADAMS Accession No. ML112730197)
- 05000391/2011609, Section C.1.6 (ADAMS Accession No. ML11350A229)
- 05000391/2012602, Section C.1.3 (ADAMS Accession No. ML12087A324)
- 05000391/2012603, Section C.1.2 (ADAMS Accession No. ML12123A156)
- 05000391/2012604, Section C.1.4 (ADAMS Accession No. ML12167A212)
- 05000391/2014602, Section E.1.1 (ADAMS Accession No. ML14086A063)
- 05000391/2014603, Section E.1.1 (ADAMS Accession No. ML14129A381)
- 05000391/2014607, Section C.1.2 (ADAMS Accession No. ML14274A076)
- 05000391/2014608, Section OA.1.4 (ADAMS Accession No. ML 14322A182)

Section 2.01 of this IP required the review of findings associated with IP 50071 and that they were considered as part of the inspection efforts for IP 50073. The reconstitution effort determined the requirements for IP 50071 were met and no additional inspections were required.

Section 02.02 of this IP required observation of work performance associated with 14 mechanical components within the reactor coolant pressure boundary and 10 mechanical components outside the reactor coolant pressure boundary to determine if the selected components met applicable requirements. The reconstitution effort determined that a sample size of four safety-related components and two motor-

operated valves would satisfy this section and only subsection 02.02b was required to be performed.

- Section 02.02a, Receipt Inspection: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. However, additional receipt inspections were observed for new work activities as documented in IIRs 05000391/2010604, 05000391/2010605, and 05000391/2011609.

- Section 02.02b, Storage, Handling, and Protection: The reconstitution effort determined that this subsection of the IP required the storage, handling, and protection inspection of four reactor coolant pressure boundary components and two motor operated valves minimum. Inspection for reactor coolant pressure boundary components was documented in IIR 05000391/2010604 and IIR 05000391/2012602. Inspection for motor operated valve actuators was documented in IIR 05000391/2011605. This IP subsection is considered closed with the specified number of samples obtained.

- Section 02.02c, Installation: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. Additional inspections of this subsection were performed for new work activities and documented in IIRs 05000391/2009605, 05000391/2010604, 05000391/2011603, 05000391/2011607, 05000391/2012603, 05000391/2012604, 05000391/2014607, and 05000391/2014608.

- Section 02.02d, Protection and Maintenance after Installation: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. Additional inspections of this subsection were performed for new work activities and documented in IIR 05000391/2010602.

Section 02.03 of this IP required the selection of six persons associated with mechanical component installation or inspection and to confirm or discuss their qualifications, management support, ability to perform assigned duties, etc. The reconstitution effort determined this subsection of the IP closed and it was documented in IIR 05000391/2009602. Additional inspections of this subsection were performed for new work activities and documented in IR 05000391/2009604, 05000391/2010604, 05000391/2010605, 05000391/2011603, and 05000391/2011605.

Section 02.04 of this IP required the review of as-built/final design system drawings and to compare with the actual installation and to determine if the applicant had properly controlled and documented changes or discrepancies. The reconstitution effort determined that the sample size for this section would be 12 safety-related mechanical components. A total of 20 safety-related mechanical components were inspected in IIRs 05000391/2014602, 05000391/2014603, and 05000391/2014608. This IP section is considered closed with the specified number of samples obtained.

Section 02.05 of this IP allowed for additional inspections based on the results of the old SALP program. The SALP program is no longer in use. There is now a different process used for determining the need for additional inspections. This section was determined to be closed as no need for additional inspections were identified for this area.

b. Observations and Findings

No findings were identified.

Below is a summary of each section of IP 50073:

- Section 02.01 – Complete
- Section 02.02 – Complete
- Section 02.03 – Complete
- Section 02.04 – Complete
- Section 02.05 – Complete

c. Conclusion

The inspectors determined that the receipt inspections, storage requirements, installation and layup maintenance observations, personnel qualifications, and as-built documentation associated with the safety-related mechanical components met the applicable requirements. The bulk of the new work activities were associated with safety-related mechanical components outside of the reactor coolant pressure boundary. The representative samples selected for the safety-related mechanical components within and outside of the reactor coolant pressure boundary met the intent of IP 50073. IP 50073 is considered closed.

C.1.4 (Closed) Safety-Related Components – Record Review (Inspection Procedure 50075)

a. Inspection Scope

Background: As described in IMC 2517, TVA addressed WBN Unit 1 construction quality issues as part of the implementation of its NPP. The results of the NRC inspection program were published in NUREG-1528, "Reconstitution of the IMC 2512 Construction Inspection Program for Watts Bar Unit 1." In 1985, construction on Watts Bar Unit 1 and Watts Bar Unit 2 was stopped due to the identification of multiple construction QA issues. TVA completed Unit 1 in 1995 but had conducted very little Unit 2-specific work since 1985. In 2007, TVA decided to finish the Unit 2. As part of confirming that all issues and inspection requirements will be completed for Unit 2, a review of all NRC inspection reports was initiated to determine the status of the required IPs, contained in NRC IMC 2512, in effect at the time construction was stopped. This effort was called the reconstitution process. The NRC used the results of the reconstitution process to identify areas which require additional inspections. IIR 5000391/2009602 (ADAMS Accession No. ML091210420), Attachment 2, documented the reconstitution results for IP 50075 and determined that the requirements of the IP were met for Unit 2 except for the completion of Section 02.03.c, specifically, for four reactor coolant pressure boundary components and two motor-operated valves.

In addition, new safety-related mechanical component records for work or activities performed in areas covered by IP 50075 would be inspected. The majority of the safety-related mechanical component work activities were completed and inspected prior to Unit 2 construction reactivation in 2007. The inspection scope for new work included a sample of QA audit, storage, handling, refurbishment, installation, and personnel qualification records.

Inspection Activities: This section contains a summary of the work performed by the inspectors to review records of installation activities to verify that those records were in accordance with regulations. The purpose of this IP was to review a sample of safety-related component records during construction to verify the applicant prepared, reviewed, and maintained records and that the records reflected work accomplishment consistent with NRC requirements and commitments made by the applicant.

Portions of this IP have been previously addressed through inspection samples credited in the following inspection reports, including some, where IPs 50073 and 50075 reactor vessel and internals work observations and records reviews were performed.

- 05000391/2009602, Attachment 2 (ADAMS Accession No. ML091210420)
- 05000391/2010603, Section OA.1.1 (ADAMS Accession No. ML102170465)
- 05000391/2010605, Section C.1.4 (ADAMS Accession No. ML110410680)
- 05000391/2011605, Section C.1.4 (ADAMS Accession No. ML112201418)
- 05000391/2012604, Section C.1.9 (ADAMS Accession No. ML12167A212)
- 05000391/2013608, Section C.1.5 (ADAMS Accession No. ML13316A776)
- 05000391/2014602, Section E.1.1 (ADAMS Accession No. ML14086A063)

Section 02.01 of this IP required the review of licensee/contractor requirements covering the span of records for safety-related components and to determine the initiation point for each major group of records and those responsible for ensuring that the recorded information met the approved quality assurance requirements for records. In addition, findings associated with IP 50071 were considered as part of the inspection efforts for IP 50075. The reconstitution effort determined this requirement was completed and was documented in IIR 05000391/2009602, Attachment 2.

Section 02.02 of this IP required the review of two recent QA audits associated with safety-related components and to determine if the audits' scope and results were clearly defined, audits were conducted by trained personnel, the frequency of audits conformed to requirements, appropriate follow-up actions to resolve weaknesses were adequately dispositioned, and audits were timely. The reconstitution effort determined this requirement was completed and documented in IIR 05000391/2009602, Attachment 2. Additionally, inspectors reviewed audits in IIR 05000391/2010603 and IIR 05000391/2010605.

Section 02.03 of this IP required the review of quality-related records associated with safety-related components and to determine whether the records conform to established procedures and reflect work accomplishment consistent with requirements.

- Section 02.03a, Receipt Inspection and Material Certification: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. Additionally, inspectors reviewed receipt inspection and material certification records associated with butterfly valves as documented in 05000391/2010605.

- Section 02.03b, Nonconformance/Deviation reports: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. Additionally, inspectors reviewed records associated with problem evaluation reports in IIR 05000391/2013608.

- Section 02.03c, Storage Inspection: The reconstitution effort determined that this subsection of the IP required the storage inspection of four reactor coolant pressure boundary components and two motor-operated valves. Inspection of storage records for four reactor coolant pressure boundary components was documented in IIR 05000391/2012604. Inspection of storage activities and associated records for three motor-operated valve actuators was documented in IIR 05000391/2011605. This IP subsection is considered closed with the specified number of samples obtained.

- Section 02.03d, Installation Inspections: The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602. Additionally, inspectors reviewed records associated with system 67 and system 70 as documented in IIR 05000391/2014602.

Section 02.04 of this IP required the review of personnel qualification records and to determine if qualified licensee/contractor, craft, and inspection personnel were being employed on safety-related component installation work. The reconstitution effort determined this subsection of the IP closed and was documented in IIR 05000391/2009602; however, during the inspection period the inspectors reviewed five employee training records associated with WOs 115755610 (turbine driven exhaust Fan) and 113336379 (containment spray heat exchanger 2A). The inspectors reviewed the training records to verify the following:

- determine whether a system of personnel qualification records meeting the stated requirements existed and was being maintained
- determine if the records were sufficient to reasonably support qualification in terms of certification, experience, proficiency, training, testing, etc., as applicable
- reviewed the actions taken by responsible licensee/contractor organizations to independently authenticate the validity of critical qualification statements (this effort had also been accomplished during prior reviews of training qualification performed under other inspection procedures such as IPs 50090, 49063, 51063, etc.)

Section 02.05 of this IP allowed for additional inspections based on the results of the old SALP program. The SALP program is no longer in use. There is now a different process used for determining the need for additional inspections. This section was determined to be closed, as no need for additional inspections were identified for this area.

b. Observations and Findings

No findings were identified.

Below is a summary of each section of IP 50075:

- Section 02.01 – Complete
- Section 02.02 – Complete
- Section 02.03 – Complete
- Section 02.04 – Complete
- Section 02.05 – Complete

c. Conclusion

The inspectors determined that the audits, installation, receipt inspections records, nonconformance/deviation reports, storage inspections, and personnel qualification records associated with the safety-related mechanical components met the applicable requirements. IP 50075 is considered closed.

C.1.5 (Closed) Electric Cable - Work Observation (Inspection Procedure 51063)

a. Inspection Scope

Background: As described in IMC 2517, TVA addressed WBN Unit 1 construction quality issues as part of the implementation of its NPP. The results of the NRC inspection program were published in NUREG-1528, "Reconstitution of the IMC 2512 Construction Inspection Program for Watts Bar Unit 1." In 1985, construction on Watts Bar Unit 1 and Watts Bar Unit 2 was stopped due to the identification of multiple construction QA issues. TVA completed Unit 1 in 1995 but had conducted very little Unit 2-specific work since 1985. In 2007, TVA decided to finish the Unit 2 plant. As part of confirming that all issues and inspection requirements will be completed for Unit 2, a review of all NRC inspection reports was initiated to determine the status of the required IPs, contained in NRC IMC 2512, in effect at the time construction was stopped. This effort was called the reconstitution process. The NRC used the results of the reconstitution process to identify areas which require additional inspections. IIR 05000391/2009602, Attachment 2, (ADAMS No. ML091210420) documented the reconstitution results for IP 51063 and determined that the requirements of the IP were not fully met for Unit 2 and that further inspections were warranted. IIR 05000391/2009602, Attachment 2, specifically documented that inspections of in-process installation for four power cable terminations involving stress cone (02.02.c) should be performed and inspections of Section 02.02, Raceway Loading for One Division B Power Cable Tray, should be performed.

Inspection Activities: This section contains a summary of the work performed by the inspectors to review installation activities to verify that those installation activities were accomplished in accordance with regulations. The purpose of this IP was to verify that activities relative to safety-related electrical cable systems were controlled and accomplished in accordance with NRC requirements, safety analysis report (SAR) commitments, and licensee procedures. The inspectors directly observed and performed independent evaluations of work performance, including both work in progress and completed work. This IP included receiving inspections, storage, in-process installation, completed work, as-built verification, cable testing, and raceway loading. This IP applied to cables and their associated terminations. For this IP, Section 02.01 outlines the required sample selection for each of the 02.02 subsections.

The following table lists the inspections that were performed under this IP.

IP Section	Inspection Reports	ADAMS Accession Number
02.02.a Receiving Inspection	• 05000391/2009603, Section C.1.6 • 05000391/2010602, Section C.1.3	• ADAMS No. ML092120326 • ADAMS No. ML110800483

02.02.c In-Process Installation	• 05000391/2009604, Section C.1.9 • 05000391/2010602, Section C.1.1 • 05000391/2010604, Section C.1.12 • 05000391/2010605, Section C.1.15 • 05000391/2011603, Section C.1.12 • 05000391/2011605, Section C.1.6 • 05000391/2011607, Section C.1.5 • 05000391/2011608, Section C.1.3 • 05000391/2011610, Section C.1.2 • 05000391/2013607, Section C.1.7 • 05000391/2013608, Section C.1.7 • 05000391/2014603, Section C.1.5	• ADAMS No. ML093030479 • ADAMS No. ML110800483 • ADAMS No. ML103060240 • ADAMS No. ML110410680 • ADAMS No. ML111370702 • ADAMS No. ML112201418 • ADAMS No. ML112730197 • ADAMS No. ML11311A082 • ADAMS No. ML12034A202 • ADAMS No. ML13273A512 • ADAMS No. ML13316A776 • ADAMS No. ML14129A381
02.02.d Completed Work	• 05000391/2009604, Section C.1.9 • 05000391/2010605, Section OA.1.14 • 05000391/2013608, Section C.1.7 • 05000391/2014603, Section C.1.5 and OA.1.10 • 05000391/2014604 Section OA.1.23 and OA.1.25	• ADAMS No. ML093030479 • ADAMS No. ML110410680 • ADAMS No. ML13316A776 • ADAMS No. ML14129A381 • ADAMS No. ML14177A214
02.02.e As-Built Verification	• 05000391/2009605, Section C.1.5. • 05000391/2010605, Section C.1.16	• ADAMS No. ML100290703. • ADAMS No. ML100290703
02.02.f Cable Testing	• 05000391/2011607, Section OA.1.2 • 05000391/2012608, Section C.1.5	• ADAMS No. ML112730197 • ADAMS No. ML12319A368
02.03 Raceway Loading	• 05000391/2014603, Section C.1.7 • 05000391/2014604 Section C.1.3 • 05000391/2014614	• ADAMS No. ML14129A381 • ADAMS No. ML14177A214 • ADAMS No. ML14363A315

	Section C.1.3 • This report, Section C.1.5	

b. Observations and Findings

No findings were identified.

Below is a summary of each section of IP 51063:

- Section 02.01 – Complete
- Section 02.02 – Complete
- Section 02.03 – Complete
- Section 02.04 – Complete. This item is for additional inspections if determined needed by the SALP program. The SALP program is no longer in use. There is now a different process used for determining the need for additional inspections. This section was determined to be closed as no need for additional inspections has been identified for this area.

c. Conclusions

The inspectors determined that the work observations, procedures, and as-built equipment associated with electrical cable systems met the applicable requirements. Based on the historical NRC inspections and the recent inspection efforts, a sufficient number of samples have been observed to consider IP 51063 closed.

C.1.6 Verification of As-Builts (Inspection Procedure 37051)

a. Inspection Scope

The inspectors performed field walkdowns of selected portions of the A and B train auxiliary feedwater pump power cables to determine if final design drawings, pull cards, and specifications reflected:

- as-built conditions for cables relative to routing, identification, protection/isolation, and separation from redundant cable; and
- as-built identification for each conductor at termination points

The inspectors performed field walkdowns of selected portions of the A and B train auxiliary feedwater pump electrical conduit and tray runs to determine whether there is reasonable assurance that the raceways final design drawings and specifications reflected:

- Location and routing
- supports
- separation and isolation,
- physical and thermal cable loading, and
- conduit and tray identification

The following samples were inspected:

- IP 37051, Section 02.01.b.3 - four samples

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

The inspectors determined that the as-built configurations of the sampled electric cable routing along with electrical conduits and tray runs reflected the applicable construction drawings, procedures, specification, SAR, and NRC requirements.

P.1 Preoperational Activities

P.1.1 Preoperational Test Program Implementation Verification (Inspection Procedure 71302)

a. Inspection Scope

(Weekly Inspection Activities): The inspectors verified that the applicant's management control system was effectively discharging its responsibilities over the preoperational testing program by direct observation of activities, tours of the facility, interviews and discussions with the applicant's personnel, and reviewing facility records. Preoperational testing activities during the inspection period included the following systems or portions thereof:

- System 070, Component Cooling System
- System 063, Safety Injection System

As systems became available for preoperational testing, inspectors toured the accessible areas of the facility to make an independent assessment of equipment conditions, plant conditions, security, and adherence to regulatory requirements. Inspectors also verified the following, as available and on a sampling basis, during the tours:

- general plant/equipment conditions;
- plant areas for fire hazards - examined fire alarms, extinguishing equipment, actuating controls, firefighting equipment, and emergency equipment for operability and also verified that ignition sources and flammable material were being controlled in accordance with licensee's procedures (further discussed in Section F.1.1);
- activities in progress (e.g., maintenance, preoperational testing, etc.) were being conducted in accordance with licensee's procedures;
- listened for the public address system announcements to determine that blind spots do not exist; (i.e., cannot be heard clearly enough to be understood); and
- construction work force authorized to perform activities on systems or equipment.

In addition, the inspectors observed the motor-operated valve stroke time logic test for valves 2-FCV-063-152, 2-FCV-063-6, and 2-FCV-063-153. The inspections were completed to verify that the testing was conducted in accordance with the approved procedures 2-PTI-063-05-A, Safety Injection System Pump/Valve Logic Test Train A, Revision (Rev.) 2, and 2-PTI-063-05-B, Safety Injection System Pump/Valve Logic Test Train A, Rev. 2.

b. Observations and Findings

No findings were identified.

c. Conclusion

The applicant's implementation of the preoperational test program was in accordance with procedures for those activities observed during the inspection period.

P.1.2 (Closed - 70305) Preoperational Test Procedure Review (Inspection Procedures 70300 and 70305)

a. Inspection Scope

Background: The purpose of IMC 2513, Light Water Reactor Inspection Program - Preoperational Testing and Operational Preparedness Phase, issue date January 1, 1984, is to verify through direct observation, personnel interviews, and review of facility records that:

- systems and components important to the safety of the plant are fully tested to demonstrate that they satisfy their design requirements; and
- management controls and procedures, including QA programs, necessary for operation of the facility have been documented and implemented.

IMC 2513 defines the minimum inspection program for a finding of readiness for license issuance (IP 94302, Status of Watts Bar Unit 2 Readiness for an Operating License). IMC 2513 requires the procedural review of the mandatory tests defined in IMC 2513 and five of the primal tests defined in IMC 2513. The following inspection was performed in relation to satisfying the required procedural review for the reactor protection system (RPS).

Inspection Activities: During this inspection period the inspectors continued their review of pre-operational test instructions (PTIs) 2-PTI-099-01, RPS and ESFAS Response Times, 2-PTI-099-03, RPS Operational Test, 2-PTI-099-04, Safeguard System Operational Test, 2-PTI-099-05, Overpower Delta–T and Overtemperature Delta–T Turbine Runback, 2-PTI-099-06, Reactor Protection Setpoint Verification, and 2-PTI-099-08, Safeguards System Test Panel, to verify that the procedures were technically adequate, consistent with regulatory requirements and licensee commitments.

The inspectors evaluated the adequacy of configuration controls established for circuitry and components under test, the use of measurement and test equipment, use of test acceptance criteria, and methodologies defined to obtain positive verifications of all circuit functions. The review verified the procedures focused on important system performance functions such as:

- response time of protection channels;
- correct operation of protection systems;
- alarm functions;
- electrical independence and redundancy;
- logic functions;
- automatic and manual system operation;
- permissive, prohibit, and bypass functions;
- ESF signal functions; and
- system boundaries were reviewed to verify adequate overlap exists between tests to ensure the entire system will be tested.

The inspectors also evaluated whether preoperational test procedures implemented the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- each page had appropriate identification information;
- the last page was clearly identifiable by markings;
- there was a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements were included;
- signoff requirements including concurrent and independent verification steps were included where appropriate;
- equipment alignment instructions were clear and concise;
- equipment identifiers were accurate;
- actions to be taken within the steps were clearly identified;
- tables, data sheets, and work sheets were clearly usable;
- calculation sheets were technically accurate;
- there were clear instructions for system restoration;
- there were overall, clear concise steps for testing with action critical (acceptance criteria) steps identified;
- there were clear quantitative acceptance criteria with acceptability and contingencies;
- the overall sequence of the procedure was consistent with the obtaining the intended result; and,
- precautions or explanations were placed immediately ahead of the steps to which they applied.

Previous inspection efforts were documented in IIRs 05000391/2014603 (ADAMS Accession No. ML14129A381), 05000391/2014604 (ADAMS Accession No. ML14177A214) and 05000391/2014607 (ADAMS Accession No. ML14274A076). Those inspection reports documented a series of comments and questions between the NRC and the applicant on the PTI series 99 procedures. During this inspection period the inspectors reviewed the applicant's supplemental responses for adequacy.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure results were reviewed, evaluated, and accepted in a manner consistent with the guidance of procedure SMP-8.0, Watts Bar Nuclear Plant Unit 2 Administration of Preoperational Test Instructions, Rev. 9. This completes the procedure review for preoperational test procedures 2-PTI-099-01, 2-PTI-099-03, 2- PTI-099-04, 2-PTI-099-05, 2-PTI-099-06, and 2-PTI-099-08. The preoperational testing procedure review for System 99, IP 70305, is closed.

P.1.3 (Closed) Preoperational Test Procedure Review (Inspection Procedures 70300 and 70311)

a. Inspection Scope

Background: The background for this preoperational test procedure review is the same as that in the background section of P.1.2.

Inspection Activities: The inspectors reviewed pre-operational test procedure 2-PTI-067-01, Essential Raw Cooling Water (ERCW) Valve Functional Test, Rev. 0000, to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- each page had appropriate identification information;
- the last page was clearly identifiable by markings;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- equipment alignment instructions are clear and concise;
- equipment identifiers are accurate;
- actions to be taken within the steps are specifically identified;
- instrumentation units consistent for data collection;
- graphs, charts, tables, data sheets, and work sheets are clearly usable;
- calculation sheets were technically accurate;
- clear coordination instructions for test activities involving multiple test personnel;
- clear instructions for system restoration;
- guidance for follow-up actions and points of contact;
- overall, clear concise steps for testing with action critical (acceptance criteria) steps identified;
- clear quantitative acceptance criteria with acceptability and contingencies; and
- the overall sequence of the procedure was consistent with obtaining the intended result.

The inspectors also reviewed the procedure to verify that precautions or explanations were placed immediately ahead of the steps to which they applied. The inspectors performed a detailed review with the responsible test engineer to verify that the acceptance criteria met design requirements. Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was written in a manner consistent with NRC requirements and the guidance of applicant procedure SMP-8.0, Watts Bar Nuclear Plant Unit 2 Administration of Preoperational Test Instructions, Rev. 11. This concludes all the planned procedure reviews for System 67 (Essential Raw Cooling Water) preoperational testing. The preoperational testing procedure review for System 67 is closed.

P.1.4 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70339)

a. Inspection Scope

Background: The background for this preoperational test procedure review is the same as that in the background section of P.1.2.

Inspection Activities: The inspectors reviewed preoperational test procedure 2-PTI-070-02B, Component Cooling System Unit 2 Train B Flow Balance, to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- each page had appropriate identification information;
- the last page was clearly identifiable by markings;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- clearly identified and appropriate quality control (QC) hold points;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- equipment alignment instructions are clear and concise;
- equipment identifiers are accurate;
- actions to be taken within the steps are specifically identified;
- instrumentation units consistent for data collection;
- graphs, charts, tables, data sheets, and work sheets are clearly usable;
- calculation sheets technically accurate;
- clear coordination instructions for test activities involving multiple test personnel;
- clear instructions for system restoration;
- guidance for follow-up actions and points of contact;

- overall, clear concise steps for testing with action critical (acceptance criteria) steps identified;
- clear quantitative acceptance criteria with acceptability and contingencies; and
- overall sequence of the procedure consistent with the obtaining the intended result.

The inspectors also reviewed the procedure to verify that precautions or explanations were placed immediately ahead of the steps to which they applied. The inspectors performed a detailed review with the responsible test engineer to verify that the acceptance criteria met design requirements.

The review was also performed to verify that the following important system performance functions were adequately reflected:

- ability of the system to cool the reactor down to cold shutdown condition
- ability to maintain long-term cooling
- demonstrate all modes of operation and different system configurations
- proper system component operation, including specified flow rates through heat exchangers.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was written in a manner consistent with the guidance of procedure SMP-8.0, Watts Bar Nuclear Plant Unit 2 Administration of Preoperational Test Instructions, Rev. 9. This completes the procedure review of preoperational test procedure 2-PTI-070-02B, Component Cooling System Unit 2 Train B Flow Balance.

P.1.5 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope:

Background: The purpose of IMC 2513, Light Water Reactor Inspection Program - Preoperational Testing and Operational Preparedness Phase, issue date January 1, 1984, is to verify through direct observation, personnel interviews, and review of facility records that:

- systems and components important to the safety of the plant are fully tested to demonstrate that they satisfy their design requirements; and
- management controls and procedures, including QA programs, necessary for operation of the facility have been documented and implemented.

IMC 2513 defines the minimum inspection program for a finding of readiness for license issuance (IP 94302, Status of Watts Bar Unit 2 Readiness for an Operating License). IMC 2513 requires the preoperational test witnessing of the mandatory tests defined in

IMC 2513 and five of the primal tests defined in IMC 2513. The following inspection was performed in relation to satisfying the required preoperational test witnessing.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instructions 2-PTI-063-05A, Safety Injection System (SIS) Pump/Valve Logic Test - Train A, Rev. 2 and 2-PTI-063-05B, Safety Injection System (SIS) Pump/Valve Logic Test – Train B, Rev. 2 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following component logic tests were selected for inspection of this item:

- 2-FCV-63-93 (A)
- 2-FCV-63-152 (A)
- 2-FCV-63-6 (B)
- 2-FCV-63-153 (B)
- 2-FCV-63-63 (B)
- 2-FCV-63-112 (B)
- 2-FCV-63-166 (B)

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

The inspectors observed the tests to verify that the overall test acceptance was met. The inspectors conducted a review with the responsible test engineer to assure that the preliminary test evaluations were consistent with the inspector's observations. During the tests, the inspectors observed important data gathering activities to ensure the data was properly gathered and recorded. A post-test cursory review of the test data was performed to verify legibility, traceability, and permanence of the data sheet entries.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedures were performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2, Conduct of Test," Rev. 5.

P.1.6 Preoperational Test Witnessing (Inspection Procedures 70312 and 70439B)

a. Inspection Scope

Background: The background for this preoperational test witness is the same as that in the background section of P.1.5.

Inspection Activities: The inspectors witnessed the performance of preoperational test procedure 2-PTI-070-02B, Component Cooling System Unit 2 Train B Flow Balance, to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The inspectors verified the following attributed associated with this test:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites performed;
- plant systems in service to support the test;
- test equipment installed and within calibration;
- test was performed in accordance with the approved procedure;
- Test interruptions and continuations were handled in accordance with approved procedures;
- testing events and discrepancies were properly documented;
- test was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings.

The inspectors observed the test to verify that the overall test acceptance was met. The inspectors conducted a review with the responsible test engineer to assure that the preliminary test evaluation was consistent with the inspector's observations. During the test, inspectors observed important data gathering activities to ensure the data was properly gathered and recorded. A post-test cursory review of the test data was performed to verify legibility, traceability, and permanence of the data sheet entries.

The inspectors performed a review of one design change package associated with System 070 since the system was turned over to the applicant's start-up group to verify that reviews, processing, and implementation were performed in accordance with established procedures.

The inspectors conducted interviews and reviewed training records for two personnel involved in the above test to verify they had received appropriate training for performing the test.

Additionally, the inspectors ensured that the following important system performance functions were adequately tested:

- Manual system operation in various modes of operation including different pump/loop combinations
- Operation of system alarms and interlocks
- System hydraulic performance and flow balancing.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified. Appropriate test deficiency notices and chronological test log entries were initiated. PER 961415 was initiated to track test flow criteria.

c. Conclusions

The inspectors determined that the applicant's test was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5. This completes the test witnessing of preoperational test procedure 2-PTI-070-02B; however, additional test witnessing may occur if additional testing or retests associated with 2-PTI-070-02B are performed. The final disposition of test data, including any failure to meet acceptance criteria, will be evaluated under IP 70400, Preoperational Test Results Evaluation.

P.1.7 Preoperational Test Witnessing (Inspection Procedures 70302, 70312, and 70433)

a. Inspection Scope

Background: The background for this preoperational test witness is the same as that in the background section of P.1.5.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-062-01, Charging and Letdown Logic Test, Rev. 1, to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following component's logic tests were selected for inspection of this item:

- Section 6.1, 2-FCV-62-54
- Section 6.2, 2-FCV-62-55
- Section 6.4, 2-FCV-62-59
- Section 6.5, 2-FCV-62-9
- Section 6.6, 2-FCV-62-22
- Section 6.7, 2-FCV-62-35
- Section 6.8, 2-FCV-62-48
- Section 6.10, 2-FCV-62-61
- Section 6.11, 2-FCV-62-63
- Section 6.14, 2-FCV-62-86
- Section 6.33, 2-FCV-62-125

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

The inspectors observed the tests to verify that the overall test acceptance was met. The inspectors conducted a review with the responsible test engineer to assure that the preliminary test evaluations were consistent with the inspector's observations. During the tests, the inspectors observed important data gathering activities to ensure the data was properly gathered and recorded. A post-test cursory review of the test data was performed to verify legibility, traceability, and permanence of the data sheet entries.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5.

III. OPERATIONAL READINESS ACTIVITIES

CH.1 Chemistry Activities

CH.1.1 (Closed) LWR Water Chemistry Control and Chemical Analysis Audits (Inspection Procedure 79501)

a. Inspection Scope

The inspectors reviewed the organization for the support of the operational chemistry program at Watts Bar from the aspect of readiness to perform dual unit operations. The review included management policies, implementation procedures, delegations of authorities and responsibilities, staffing, equipment and organization.

The inspectors reviewed the existing implementation of the water chemistry control program. This review included the results of audits and appraisals and responses to

identified needs for corrective actions. Unit 1 data and records were used as a surrogate for Unit 2 as the chemistry program for both units is very similar and there is minimal chemical history available for Unit 2 at this point. The inspectors reviewed and discussed recorded water quality data for Unit 1. This included the established investigative and corrective actions taken when the chemical variables exceed the established levels or limits and timeliness of those actions.

The inspectors discussed primary system sampling under accident conditions without a dedicated post-accident sampling system to include precautions to prevent overexposing individuals due to high radiation from the sampling system after an accident.

The inspectors walked down and reviewed the proposed sampling and online monitoring facilities for Unit 2 and the existing sampling and online monitoring facilities on Unit 1. The inspectors reviewed the laboratory facilities to verify the layout, size, bench space, hood space, and lighting were adequate for the intended use.

The inspectors reviewed the implementation of the water chemistry control program. This review included policies and procedures, records, laboratory and on-line monitoring, and quality assurance program for chemical measurements.

The inspectors reviewed QA data, control charts, inter-laboratory and intra-laboratory cross checks and analytical results for both radiological and non-radiological analyses to verify the acceptability of the data.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified. The inspectors found that the transition plan for placing Unit 2 into operation with regard to the steam generators, as well as the controls and initiatives for source term control on the primary side were adequate. The inspectors noted that the experience level of the chemistry technicians met the minimum required levels.

The inspectors reviewed numerous audits of the chemistry program spanning the period from 2012 through 2014. The inspectors noted that the self-assessments were generally self-critical and appropriate.

c. Conclusions

The inspectors determined that the chemistry department was properly organized and equipped to assume dual unit operations. The procedures and policies were found to adequately define the chemistry program and adequate plans existed for transition to dual unit operations. No further inspection is needed under this IP; therefore, IP 79501 is closed.

CH.1.2 (Closed) Quality Assurance and Confirmatory Measurements for In Plant Radiochemical Analysis (Preoperational and Supplemental) (Inspection Procedure 84525)

a. Inspection Scope

The inspectors reviewed TVA's facilities and equipment that was necessary to support in-plant radiochemical analysis. The inspectors reviewed TVA's ability to collect and process primary coolant samples to verify that those activities involving samples of up to 300 micro-curies per gram would not exceed the limits in General Design Criteria 19.

The inspectors reviewed procedures for collecting post-accident samples to verify that TVA's ability to analyze post-accident samples was adequate.

Since the plant has an operating unit that participates in a recognized blind spike and split sample program the inspectors did not arrange for separate blind spike and split samples from US DOE/RESL to be provided, but rather reviewed the licensee interlaboratory comparison results.

The inspectors also reviewed the licensee's radiochemistry QA program to verify it included adequate control charts and trend plotting.

Documents reviewed are listed in the attachment.

b. Observations and Results

No findings were identified. The laboratory was directly adjacent to the auxiliary building and had provisions for shielded sample storage. The laboratory radiochemistry QA program was applicable to both Units 1 and 2, and was routinely reviewed during radiation protection baseline inspection of Effluents and the Radiological Environmental Monitoring Program. This baseline inspection is performed every 18 months, with the last documented inspection in August 2014 in IIR 05000390/2014003 (ADAMS Accession Number ML14213A424)

c. Conclusions

The licensee facilities were determined to be adequate to perform radiochemical analysis under routine and emergency conditions. No further inspection is needed under this IP; therefore, IP 84525 is closed.

IV. OTHER ACTIVITES

OA.1.1 (Discussed) Inspection to Determine Compliance with Anticipated Transient Without Scram Rule, 10 Code of Federal Regulations 50.62 (Temporary Instruction 2500/20)

a. Inspection Scope

Background: On June 1, 1984, the Commission approved publication of a final rule, 10 CFR 50.62, regarding the reduction of risk from anticipated transient without scram (ATWS) events for light water cooled nuclear power plants. At the same time, the

Commission directed the staff to complete and issue (in the form of a generic letter [GL]) QA guidance for equipment that is not safety related but is encompassed by the ATWS rule.

The ATWS rule required that each licensee develop and submit to the Director, Nuclear Reactor Regulation (NRR) a proposed schedule for meeting the requirements of the rule within 180 days after the QA guidance is issued. On April 16, 1985, NRR issued GL 85-06. The enclosure to GL 85-06 provided the explicit QA guidance required by 10 CFR 50.62. The lesser safety significance of the equipment encompassed by 10 CFR 50.62, as compared to safety-related equipment, necessarily resulted in less stringent QA guidance. Temporary Instruction (TI) 2500/20 required an inspection focused on the implementation of the ATWS rule requirements, 10 CFR 50.62, and on the effectiveness of the QA controls applied to ATWS activities. This item was previously inspected in IIR 05000391/2014602 (ADAMS No. ML14086A063), Section OA.1.18, which inspected the turbine pressure transmitters associated with ATWS for location, orientation, and support. It also concluded that the TI would remain open pending completion of TI 2500/20, Section 04.05; Confirmation of Completed Work and Verification of the Instrument Channel Location, Orientation, and Support.

Inspection Activities: The inspector observed the remaining nonsafety-related portions of the channel to verify location, orientation and support. Specifically, the inspectors observed:

- the relays and wiring related to the ATWS mitigation system actuation circuitry (AMSAC) components cabinets 2-R-70 and 2-R-74;
- a relay associated with AMSAC in panel R-77;
- various components associated with AMSAC in Panel 2-R-178 and 2-L-11B; and
- the wiring associated with panel 2-L-381.

The inspector also observed the handswitches and alarms in the control room to verify that they were installed in accordance with design for location and orientation.
The inspectors reviewed a maintenance procedure and also the operator training manual for AMSAC. The inspectors inspected the control room to verify that a permanently installed means for bypassing the AMSAC for maintenance and testing existed, along with continuous indication of the bypass status in the control room. The inspectors reviewed drawings to verify that, once the mitigative action was initiated, the action goes to completion as stated in SER 23. The inspectors also reviewed drawings to verify that subsequent return to normal operation required deliberate action. The inspectors verified that manual means to initiate AMSAC actions existed, as described in Watts Bar SER 9 Appendix W.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

The inspectors concluded that the reviewed portions of the AMSAC system were adequate. The review of the TI would remain open pending review of a Unit 2

operational procedure and review of test results to verify that the system will perform as required.

OA.1.2 (Discussed) Safety Related Motor Operated Valve Testing and Surveillance (Generic Letter 89-10) (TI 2515/109, Inspection Procedures 50073, 51053)

a. Inspection Scope

The inspectors observed dynamic motor operated valve (MOV) diagnostic tests for the following GL 89-10 MOVs:

- 2-FCV-62-90-A, Chemical and volume control system charging isolation valve

For this MOV the inspectors reviewed the test activities to determine if they were properly controlled and handled. To make those determinations, the inspectors used work instructions, applicable design specifications, calculations, system descriptions, work packages, and approved procedures. The inspectors reviewed applicable MOV sizing calculations to determine if the applicant adequately sized the MOV in accordance with GL 89-10 and if the switch settings were consistent with the expected design basis conditions for the operation of the valve.

During the observance of the test, the inspectors determined if:

- test personnel accomplished activities in accordance with the applicable test procedure and work instructions;
- fluid pressure, differential pressure, and flow adequately replicated applicable design basis conditions;
- measuring and test equipment used during the test was properly identified, traceable, and within the current calibration interval;
- measuring and test equipment was suitable for the application, was used within the calibrated range, and was recorded in the applicable WOs;
- test results were recorded during the activity; and
- test discrepancies were properly identified for resolution.

The inspectors reviewed MOV thrust and torque capability engineering calculations for the MOVs listed above to determine if the:

- actuator selections were in compliance with applicable site specifications and design requirements;
- design inputs for design basis operating conditions (such as temperature, flow, and pressure – including differential pressure) were consistent with the applicable system description and the Final Safety Analysis Report;
- calculations complied with design standard DS-M18.2.22, TVA Mechanical Design Standard for MOV Design Basis, and Joint Owner's Group Review Methodologies Revision 6; and
- calculations complied with design standard DS-M18.2.21, Mechanical Design Standard for Motor Operated Valve Thrust and Torque Calculations, Rev. 21.

The inspectors observed applicant activities in response to GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance." The inspectors performed Part 2

inspections as documented in TI 2515/109. The inspectors performed these reviews to determine if the applicant had established and was implementing a program that will ensure the proper performance of MOVs in safety-related systems. Because Watts Bar Unit 2 has not operated yet, the applicant has not fully established a GL 89-10 program; therefore, the requirements of GL 89-10 have not been fully implemented.

The inspectors previously reviewed applicant actions to address GL 89-10; therefore, this inspection was a limited scope inspection of the requirements of this TI. In accordance with requirements of TI 2515/109, Rev. 4, the inspectors evaluated and answered the following questions for Part 2:

Part 2, Verification of Program Implementation:

For a sample of MOVs from the population of MOVs in the GL program:

04.05 Verify that the licensee had performed design-basis reviews of the sampled MOVs consistent with the GL or its commitments (where accepted under Part 1), as appropriate.

The inspectors sampled one GL 89-10 MOV, 2-FCV-62-90-A, to review as part of this inspection. The inspectors determined that the applicant's design basis review was adequate for the sampled valves. The inspectors determined that more inspections are required to meet the sample requirements contained in Section 05.02.k of the TI.

04.06 Verify that the licensee had adequately sized the sampled MOVs in accordance with the GL or its commitments (where accepted under Part 1), as appropriate. Verify that switch settings are consistent with the expected design conditions for operation of the valve.

The inspectors verified that the applicant properly sized the sampled MOVs and that the limit and torque switch settings were appropriate. The inspectors verified the engineering design was completed in accordance with applicable site specifications and design criteria. The inspectors reviewed the applicable thrust/torque and actuator capability engineering calculations for the sampled MOV to ensure that the applicant had appropriately sized the actuator. The inspectors observed dynamic MOV testing on the sampled valve and determined that the licensee appropriately set the limit and torque switches.

04.07 Verify that the licensee had demonstrated the design-basis capability of the sampled MOVs and the adequacy of the licensee's program applied to the sampled MOVs in accordance with the GL or its commitments (where accepted under Part 1), as appropriate.

The inspectors reviewed the reconciled MOV calculation(s) for the sampled MOV and determined that the applicant adequately incorporated the dynamic test results into the calculation(s). The valve factor and rate of loading values obtained during dynamic testing were below the values used in the calculations. Design assumptions were conservative and the applicant

effectively demonstrated adequate margin for actuator capability under worse case accident scenarios.

04.08 Verify that the licensee had established a method for periodic verification of adequate capability of the sampled MOVs in accordance with the GL or its commitments (where accepted under Part 1), as appropriate.

This will be verified during inspection activities for GL 96-05.

04.09 Verify that the licensee had analyzed MOV failures which have occurred and has an effective corrective action plan to prevent reoccurrence and the licensee trends failures of MOVs in accordance with the GL or its commitments (where accepted under Part 1), as appropriate.

The applicant maintained established procedures, which were common to all TVA nuclear units including Watts Bar Unit 2, to analyze MOV failures. The inspectors determined that these procedures were adequate.

04.10 Verify that the licensee is meeting the program schedule in accordance with the GL or its commitments (where accepted under Part 1), as appropriate.

This item was intended to track the licensee's scheduled commitment to address the periodic verification commitments associated with GL 96-05. This item is not applicable for Watts Bar Unit 2 because the unit is under construction. TVA is completing the MOV component testing for each valve in the approved program and will implement scheduled periodic verification tests in accordance with the approved MOV program similar to the Watts Bar Unit 1 program as approved in Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2 (NUREG-0847, Supplement 16).

04.11 Verify QA program implementation in the design control and testing of the sampled MOVs.

Based on the activities inspected, the inspectors determined that the applicant was properly implementing their QA program with regards to Unit 2 GL 89-10 MOVs.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the activities reviewed, MOV testing was conducted by qualified individuals using qualified procedures, design calculations were performed in accordance with applicable specifications, and the applicant was adequately implementing GL 89-10 requirements. Additional inspection activities are required to complete this TI. These activities include additional samples for Part 2 and Part 3 requirements of this TI. Based

on this limited review and the remaining actions by the applicant, no additional conclusion is warranted for this inspection.

OA.1.3 (Discussed) Environmental Qualification (EQ) Special Program (Temporary Instruction (TI) 2512/036)

a. Inspection Scope

Background: 10 CFR 50.49 requires the environmental qualification (EQ) of safety related and important to safety electrical equipment to ensure the electrical equipment required to maintain the reactor coolant pressure boundary integrity, to shut down the reactor and maintain it in a safe shutdown condition, and to prevent or mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR Part 100 guidelines remains operable when needed. It is furthermore required that the records that substantiate equipment EQ capabilities be available and maintained in auditable files.

TVA initiated the EQ Special Program at Watts Bar 2 to ensure and document that safety-related electrical equipment installed in the plant is qualified to perform their designated function in the potentially harsh environment to which they will be subjected during normal plant operation as well as during postulated accidents; and that programs and procedures are established to ensure that qualification is maintained as the plant ages and as future plant modifications are made. TVA is developing environmental qualification data packages (EQDP) change documents for Unit 2 equipment to later integrate them into the existing EQDPs for unit 1. For new model or types of equipment which are only installed in Unit 2, new EQ files and documents are being developed. The purpose of this inspection was to review the status and progress of this effort in anticipation of closure of this item during a future inspection. A previous inspection on these topics was documented in NRC IIR 05000391/2014604.

Inspection Activities: The inspectors interviewed responsible personnel to determine the status of the project and the progress made since the last inspection. The inspectors reviewed samples of completed EQ change supplements (EQCS) and EQ information releases (EQIR). EQCSs are used to document the engineering basis for qualification of equipment. EQCSs were reviewed to ensure that engineering design information for Unit 2 components and cables that provided EQ basis were appropriately extracted from engineering document construction releases (EDCR) to be included in the EQCS documents for later addition to the corresponding combined Units 1 and 2 EQDPs. EQIRs are used to document actual field installation of equipment. Samples of completed EQIRs were reviewed to ensure that as-installed devices were the same or similar to those devices identified in the EQCS and to ensure that information required for maintaining installed equipment and maintaining compliance to 10 CFR 50.49 was properly documented.

The inspectors selected a sample of EQDPs that the applicant stated had been completed for Unit 2 and the systems had been turned over to the startup organization. The inspectors reviewed the associated EQCSs posted against the applicable EQDP to verify the qualified life and surveillance requirements were established. The inspectors also reviewed the associated EQIRs which provided the field verification installation information. The inspectors sampled the associated Master Equipment List (MEL) and Harsh Environment Records Management System data base to verify that the EQ data

and maintenance requirements had been updated in accordance with the associated EQIR. Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Inspectors concluded that the records reviewed met the 10 CFR 50.49 requirements to substantiate equipment EQ capabilities and to be available and maintained in auditable files. TVA still has several safety related systems for which EQ documentation work has yet to be completed. Therefore, this TI will remain open until additional safety-related systems with EQ components are completed.

OA.1.4 (Closed) Construction Deficiency Report 391/87-10: Failure of Category "C" Devices May Adversely Affect Category "A" Devices (Temporary Instruction 2515/036)

a. Inspection Scope

Background: Construction deficiency report (CDR) 391/87-10 identifies a condition in which the failure of EQ Category "C" electrical devices may result in EQ Category "A" devices being unable to perform their safety functions. The root cause of the deficiency was determined to be attributed to the fact that at the time the components in question were designed, the EQ program was less stringent than the requirements contained in 10 CFR 50.49 and TVA's EQ program.

Inspection Activities: Inspectors reviewed actions taken for Watts Bar Unit 2 as it related to modified program requirements and engineering evaluations to address the condition identified in CDR 391/87-10. Specifically, for a sample of Category "C" devices, the inspectors reviewed category and operating times calculations to ensure the proper identification and documentation of component functions for each of the 10 CFR 50.49 accidents or events potentially causing a harsh environment, the operating time and category associated with each event, and a justification for the operating time and category. The inspectors also reviewed a sample of completed failure analysis calculations to verify that the environmentally-induced failures of Category "C" devices were analyzed to ensure that their failure will not prevent Category "A", "B", and other essential devices from performing their intended safety functions. The inspectors reviewed EDCRs, wiring diagrams, and WOs generated to ensure that specified Category "C" devices that may fail due to a harsh environment were properly isolated from Category "A" devices.

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on a review of the applicant's engineering complete closure package and the above inspection activities, the inspectors determined that the applicant had taken steps to adequately address the issues noted in CDR 87-10. This item is closed.

OA.1.5 (Closed) Supplemental Safety Evaluation Report Appendix HH – Item 17, The NRC staff should verify the accuracy of the Unit 2 EQ list prior to fuel load. (Temporary Instruction 2512/036)

a. Inspection Scope

Background: 10 CFR 50.49 requires that TVA must prepare a list of electrical equipment important to safety that is located in a harsh environment and must be environmentally qualified. As of the writing of Supplement 22 of the Watts Bar 2 Safety Evaluation Report, the applicant had not completed such a list for Unit 2.

Inspection Activities: The inspectors reviewed the completed EQ list for Unit 2 and compared it with the current EQ list for Unit 1. The inspectors conducted a detailed discussion with the engineers responsible for developing the Unit 2 EQ program to assess the completeness and accuracy of the lists and to understand the reasons for the differences in the unit lists.

b. Observations and Findings

No findings were identified. The responsible engineers were able to provide in all cases a reasonable explanation for the differences between the EQ lists for the two units.

c. Conclusion

The inspectors concluded that the applicant has developed the required EQ list for Watts Bar unit 2. This item is closed.

OA.1.6 (Closed) Construction Deficiency Report 391/83-48: Relocating Sensing Lines on Upper Containment Cooler (Inspection Procedures 92701 and 52053)

a. Inspection Scope

Background: The deficiency was initially reported to the NRC on August 10, 1983, as Nonconforming Report WBN NEB 8321 in accordance with 10 CFR 50.55(e). The issue was then documented as CDR 390/83-50 for Unit 1 and CDR 391/83-48 for Unit 2.

The CDRs documented a concern dealing with a preoperational test deficiency (PT-162) where ventilation (system 30) sensing line flow switches were not installed in accordance with TVA mounting drawing 47A900-58. The root cause was identified as improper review. The applicant implemented the following corrective actions for Unit 1:

- Incorrectly positioned sensing lines were cut off at the duct wall.
- Pressure readings were taken to determine proper set points and subsequently revised.

- Detail drawings were revised to clarify the proper installation of the sensing lines.
- Sensing lines were relocated to the suction side of the fans on the FHA exhaust, upper containment, and the general exhaust system coolers.

For Unit 1, the NRC reviewed the corrective actions implemented, the revised applicant's final report, supporting documentation, and had discussions with applicant personnel. This issue was closed for Unit 1 in IR 50-390/84-53 and 50-391/84-42 (ADAMS Accession No. ML072570621).

For Unit 2, NRC has completed several inspections where the inspectors reviewed the applicant's engineering complete open item closure report, including referenced documents and actions associated with PERs which were issued to track required Unit 2 actions for CDR 391/83-48. The inspectors also observed the in-process and as-built installations along with calibration testing of flow switches. This was performed to determine if the corrective actions associated with sensing lines of flow switches were properly resolved and documented. These inspections were documented in IIR 05000391/2013604 (ADAMS Accession No. ML13179A079), Section OA 1.4, IIR 05000391/2014607 (ADAMS Accession No. ML14274A076), Section OA 1.2, and IIR 05000391/2014614 (ADAMS Accession No. ML14363A315), Section OA 1.5. In IIR 05000391/2014614, the inspectors concluded that additional field observations were required to verify that flow switch calibration and installation were adequately performed.

Inspection Activities: During this inspection, the inspectors observed calibration activities for flow switches FS-30-97 and FS-30-99 as required by WO 112864942, "SUTI SYS 030G WBN-2-FS-030-0095 CTN 2-030-01244-I01-000 Perform Component Test," to verify that acceptance criteria were met. The inspectors verified that proper measuring and test equipment (M&TE) was used at the required accuracy for calibration, and that the results were recorded during the activity. The inspectors also reviewed the as-built installation of the flow switch to verify that the sensing lines were properly located and oriented.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on the review of the final closure package and field activities completed during this and previous inspections, the inspectors determined that the applicant implemented appropriate actions to resolve the original construction deficiency. Based on these actions, this item is closed.

OA.1.7 (Closed) Inspection of Watts Bar Nuclear Plant Equipment Seismic Corrective Action Program Plan (Temporary Instruction 2512/021 and Inspection Procedures 51053, 51055, 52053, 52055, 50073, and 37051)

a. Inspection Scope

Background: The Equipment Seismic Qualification (ESQ) Corrective Action Program (CAP) was developed by the applicant to provide reasonable assurance that Category I and I(L) equipment were adequately qualified for design basis seismic events and were in compliance with the regulatory and licensing requirements.

For Unit 1, TVA resolved these issues via the following tasks:

- reviewed design bases to ensure that they were technically adequate and consistent interfaces existed between them and other design bases
- resolved specific technical issues utilizing:
  - document retrieval
  - walkdowns to identify and describe actions required to resolve them
  - engineering evaluations and modifications when equipment could not be qualified in the as-built configuration
- developed and populated an ESQ database
- performed process improvements to prevent recurrence.

TVA letter dated September 6, 1991, "WBN – Nuclear Performance Plan," Volume 4, Revision 1, Section III.2.6, Equipment Seismic Qualification, proposed applicant's approach for resolving this CAP. In NUREG-1232, Volume 4, "Safety Evaluation Report on Tennessee Valley Authority: Watts Bar Nuclear Performance Plan," the NRC staff concluded that TVA's CAP plan, for Unit 1, was an acceptable methodology to ensure that the conduit runs are adequately supported for all plant design conditions.

In a letter from R. R. Baron to the NRC dated October, 30 1995, TVA notified the NRC of completion of the ESQ CAP for Unit 1. NRC had previously approved the Unit 1 approach in NUREG-1232, Supplemental Safety Evaluation Report (SSER) 6 dated April 1991 and SSER 9 dated June 1992. The Watts Bar Unit 1 ESQ CAP was completed and documented in a final report issued on August 28, 1995 (NRC Inspection Report 50-390/95-55 and 50-391/95-55). As reported in NUREG-0847, Supplement 19, all CAPs and special programs (SPs) were acceptably implemented by the applicant for Unit 1. Supplement 19 also listed all applicable safety evaluations that found these programs acceptable and the inspection reports that verified implementation. Because of the similarities between Units 1 and 2, most of the design commitments for both Units 1 and 2 were addressed in the Unit 1 final closure report.

TVA's regulatory framework letter to NRC dated January 29, 2008, outlined TVA's plans for the implementation of the Unit 2 ESQ CAP which stated that the Unit 1 approach would be used. NRC letter from P. D. Milano to Mr. Bhatnagar dated February 11, 2009, "Watts Bar Nuclear Plant, Unit 2 – Status of Regulatory Framework for the Completion of Corrective Action and Special Programs and Unresolved Safety Issues," provided the staff's assessment of TVA's approaches for resolving the CAPs and SPs.

The staff concluded there was reasonable assurance that, when implemented as described, the ESQ CAP will be appropriately resolved for Unit 2.

The Unit 2 program used the Unit 1 approach and also addressed TVA's past corrective action tracking document (CATD) 22302-WBN-01. Criteria and processes relevant to the ESQ CAP were discussed in Calculation WCG-1-1419, Appendix B, Section B.3.

Since 2009, NRC inspectors reviewed and documented several aspects associated with the ESQ CAP and associated open items and inspection procedures. The results of these inspections were documented in several inspection reports. Inspection efforts of open items associated with ESQ included:

- Violation (VIO) 86-21-02, Instrument valves, Foxboro transmitters, and instrument panels not seismically qualified, closed in IIR 05000391/2014605 (ADAMS Accession No. ML14226A049).
- CDR 86-59, Qualification of ASCO solenoid valve conduit connector configuration, closed in IIR 05000391/2014605 (ADAMS Accession No. ML14226A049).
- VIO 86-02-01, Failure to follow procedures resulted in improperly installed solenoid valves/seismic qual. of switchgear, closed in IIR 05000391/2012603 (ADAMS Accession No. ML12123A156).
- CDR 85-57, Category I and I(L) instrument bolting requirements, closed in IIR 05000391/2013604 (ADAMS Accession No. ML13179A079).
- CDR 86-14, Failure to follow procedures & inadequate procedures resulted in improperly installed solenoid valves and undocumented review of seismic qualification of switchgear, closed in IIR 05000391/2014602 (ADAMS Accession No. ML14086A063).
- CDR 86-53, Inspection of Category I and I(L) locally mounted instrument bolting, closed in IIR 05000391/2013604 (ADAMS Accession No. ML13179A079).
- CDR 87-01, Inadequate support shown on typical valve support drawings, closed in IIR 05000391/2012607 (ADAMS Accession No. ML12276A028).
- CDR 87-08, Improper fabrication, inspection & documentation of wall mounted instrument panel, closed in IIR 05000391/2011603 (ADAMS Accession No. ML111370702).
- CDR 87-11, Failure to coordinate solenoid valve replacement documents, closed in IIR 05000391/2012609 (ADAMS Accession No. ML12356A073).
- CDR 87-21, Limitorque motor actuator component interchangeability, closed in IIR 05000391/2011607 (ADAMS Accession No. ML112730134).
- CDR 87-23, Failed motor pinion keys & motor shaft in Limitorque operator, closed in IIR 05000391/2012609 (ADAMS Accession No. ML12356A073).
- CDR 87-27, Potential failure of operator-to-valve engagement on Xomox supplied valves, closed in IIR 05000391/2013605 (ADAMS Accession No. ML13220A640).
- CDR 89-01, Limitorque worm shaft clutch gear failure, closed in IIR 05000391/2012607 (ADAMS Accession No. ML12276A028).
- CDR 91-31, Use of non-dedicated commercial grade electrical devices in safety-related devices, closed in IIR 05000391/2014602 (ADAMS Accession No. ML14086A063).
- TI 2512/030, Seismic Analysis CAP, closed in IIR 05000391/2010602 (ADAMS Accession No. ML101230144).

- TI 2512/029, Q-List Corrective Action Program, closed in IIR 05000391/2014604 (ADAMS Accession No. ML14177A214).
- VIO 86-21-02, Instrument valves, Foxboro transmitters, and instrument panels not seismically qualified, closed in IIR 05000391/2014605 (ADAMS Accession No. ML14226A049).
- VIO 05000391/2010603-08, Failure to Adequately Evaluate and Qualify Molded Case Circuit Breakers, closed in IIR 05000391/2012608 (ADAMS Accession No. ML12319A368).
- Unresolved Item (URI) 05000391/2011603-03, Corrective Actions associated with Adverse Conditions in Motor Control Center Buckets, closed in IIR 05000391/2012608 (ADAMS Accession No. ML12319A368).

The following inspection procedures contain guidance that is applicable to the ESQ CAP:

- IP 52053, Instrumentation Components and Systems - Work Observation
- IP 52055, Instrumentation Components and Systems - Record Review
- IP 50073, Mechanical Components - Work Observation
- IP 51053, Electrical Components and Systems - Work Observation, and
- IP 51055, Electrical Components and Systems – Record Review

Several inspection efforts and activities covered under these IPs and documented in Unit 2 inspection reports were credited towards TI 2512/021. Recent inspection efforts were associated with the ESQ CAP were documented in IIRs 05000391/2009602 (ADAMS Accession Number ML 091210420), 05000391/2011608 (ADAMS Accession No. ML11311A082), 05000391/2013607 (ADAMS Accession Number ML 13273A512), 05000391/2013610 (ADAMS Accession Number ML14049A158), 05000391/2014605 (ADAMS Accession No. ML14226A049), and 05000391/2014608 (ADAMS Accession Number ML14322A182).

Inspection results documented in IIR 05000391/2014608, Section OA.1.4, credited the ESQ CAP with field inspection of several equipment and instrumentation along with the review of several ESQ CAP-related corrective actions. At the conclusion of the inspection it was identified that additional as-built verification of equipment and instrumentation, and review of programmatic aspects (i.e., program interfaces and seismic evaluations) were required prior to the closure of the ESQ CAP.

Inspection Activities: During this inspection, the inspectors reviewed and evaluated a representative sample of Watts Bar Unit 2 seismic category I and I(L) equipment and instrumentation, and reviewed several programmatic aspects of the program. This review included field observation of actual equipment configuration and installation that was accepted by QC to verify their compliance with NRC requirements and applicant commitments. The inspectors reviewed seismic test and analysis documentation and conducted walkdowns of the following installed category (cat.) I and I(L) equipment and instrumentation:

Equipment Type	Seismic Cat.	Equipment Unique Identification Number (UNID)
Vital AC Inverter	I	WBN-2-INV-235-0003-F
Emergency Diesel Battery Charger	I	WBN-2-CHGR-215-A-A

Compressor	I(L)	WBN-2-COMP-031-0303B
Compressor	I(L)	WBN-2-COMP-031-0324B
Chiller	I	WBN-2-CLR -030-0197-B
Chiller	I	WBN-2-CLR -030-0186-A
Temperature Sensor	I	WBN-2-TE-094-8000A-B
Ice Condenser Defroster Power Transformer	I(L)	WBN-2-XFMR-061-0027/2
Essential Raw Cooling Water Pump (Vertical Pump)	I	WBN-0-PMP-067-0059-B
Air Operated Valve	I	WBN-2-FCV-030-00037-B
Air Operated Valve	I	WBN-2-FCV-062-0070-A
Containment Purge Air Exhaust Filter Plenum (Air Handler Unit)	I	WBN-2-PLM-030-0004E
Containment Purge Air Exhaust Filter Plenum (Air Handler Unit)	I	WBN-2-PLM-030-0001E
Seal Water Heat Exchanger	I	WBN-2-HTX-062-0066

The inspectors reviewed the seismic qualification documents for the selected equipment to verify that they were retrievable and that the equipment was adequately qualified for the design seismic conditions. Additionally, the inspectors interviewed applicant staff and reviewed a sample of drawings, test reports, walkthrough data, design calculations, and seismic calculations. The inspectors reviewed these qualification documents to verify that they complied with the applicable requirements of the design criteria and that the interfacial input was properly considered. The inspectors reviewed a sample of the seismic and interaction inputs documented in equipment qualification records and piping analysis calculations to verify their adequacy.

Field verifications were performed by the inspectors to determine that the equipment installed mounting configuration was consistent with applicable installation drawings and the analyzed mounting configuration. The inspectors examined a sample of equipment to verify that selected attributes of the design and construction documents were adequately reflected in the installation. The attributes observed by the inspectors included mounting details, anchorage of equipment, condition of mounted instruments, and equipment locations. The inspectors also reviewed outstanding design changes for some of the selected equipment and instrumentation and confirmed that these changes were properly controlled and documented.

The inspectors also observed the completed installation of the selected equipment and reviewed installation records to determine, as applicable, whether:

- installation requirements such as proper location, placement, orientation, configuration, alignment, mounting (including bolt torqueing of), flow direction, and tolerances were met;
- specified instrument components and associated items were used;
- components were correctly and permanently identified;
- cleanliness requirements were maintained or otherwise satisfied;
- installed equipment was adequately protected from adjacent construction activities;
- nonconforming components or conditions were identified and controlled in accordance with approved procedures;

- status of completion, maintenance, and readiness for preoperational testing was documented;
- adequate provisions were taken to ensure that the validation of the environmental qualification of instrument components was maintained;
- appropriate drawings and work procedures were available to installers;
- installation requirements, construction drawings, specifications, and work procedures were technically adequate and of the latest approved issue;
- design changes relevant to the work being observed had been appropriately processed through required review and approval routes;
- compared portions of drawings matched the actual installation;
- final design drawings and specifications reflected as-built conditions for each item indicated below;
- the pertinent quality-related records relative to the components conform with established procedures and reflected work accomplishment consistent with requirements;
- hold points were observed; and
- preparation and maintenance of installation and inspection records were adequate.

The following samples were inspected:

- IP 52053 Section 02.02d – three samples
- IP 52053 Section 02.02e – three samples
- IP 52055 Section 02.02c – three samples
- IP 50073 Section 2.02.c – six samples
- IP 50073 Section 2.04 – six samples
- IP 51053 Section 2.02.f – two samples
- IP 51055 Section 2.05 – two samples
- IP 37051 Section 2.01.b – eleven samples

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the review of the applicant's engineering complete closure package and the aforementioned inspection activities, overall program implementation of the ESQ CAP was determined to be adequate and TI 2512/021 is considered closed.

OA.1.8 (Closed) Supplemental Safety Evaluation Report, Appendix HH, Open Item 67: TVA Should Confirm and NRC Staff Verify that Component Cooling Booster Pumps for U2 are Above PMF Level (Inspection Procedure 92702)

a. Inspection Scope

Background: Appendix HH open item 67 is identified in NUREG-0847, Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2, SSER

22 (ADAMS Accession No. ML110390197). Section 9.2.2 states that TVA should confirm, and the NRC staff should verify, that the component cooling booster pumps for Unit 2 are above probable maximum flood (PMF) level.

By letter dated March 20, 2014 (ADAMS Accession No. ML14085A009), TVA stated that rather than relocating the component cooling system thermal barrier booster pumps above the PMF level, it is implementing a flood barrier modification to prevent water damage to both Unit 1 and Unit 2 pumps in the event of a PMF.

Inspection Activities: The inspectors reviewed the installed barriers to verify that the height of the barriers is greater than the proposed PMF level for WBN and documented this inspection activity in Inspection Report 05000390/2014003 (ADAMS Accession No. ML14213A424).

b. Observations and Findings

No findings were identified. The flooding barriers around the Unit 1 pumps have been installed. The Unit 2 barriers are the same design as the Unit 1 barriers and have been verified to be partially installed. For Unit 2, a section of the barrier has been left open allowing access to the pump for pre-operational testing. The Unit 2 barrier will be fully installed prior to fuel load.

c. Conclusion

Based on the results of this inspection and the documented closure of this item in SSER 27, SSER Appendix HH, Open Item 67, is closed.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

An exit meeting was conducted on January 22, 2015, to present inspection results to you and other members of your staff. The inspectors identified that no proprietary information had been received during the inspection and none would be used in the inspection report. The applicant acknowledged the observations and provided no dissenting comments.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

G. Arent, TVA – Licensing Manager
K. Bledsoe, TVA – Chemistry
R. Bolton, TVA – ERCW System Engineer
J. Bolton, TVA - ERCW Design Engineer
D. Charlton, TVA - Regulatory Compliance
W. Crouch, TVA - Engineering
J. Fisher, TVA - Regulatory Compliance
J. Grant, TVA - ERCW Startup Engineer
G. Jordan, TVA - Pump and Valve Performance Monitoring
T. Lund, TVA - Mechanical Maintenance
B. Malone, Bartlett - Electrical Engineer
J. O'Dell, TVA - Regulatory Compliance
R. Onis, TVA - Engineering
K. Peterman, TVA/Bechtel – Flow Balance Monitoring
G. Scott, TVA – Licensing
T. Sears, TVA - Heat Exchanger Monitoring Engineer
M. Skaggs, TVA – Senior Vice President
N. Welch, TVA - Preoperational Startup Manager
O. J. Zeringue, TVA - General Manager Engineering and Construction

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction and Pre-Construction Activities
IP 37051	Verification of As-Builts
IP 49053	Reactor Coolant Pressure Boundary Piping - Work Observation
IP 50073	Mechanical Components - Work Observation
IP 50075	Safety Related Components - Records Review
IP 51053	Electrical Components and Systems – Work Observation
IP 51055	Electrical Components and Systems - Record Review
IP 51063	Electric Cable - Work Observation
IP 52053	Instrument Components and Systems - Work Observation
IP 52055	Instrument Components and Systems - Record Review
IP 70300	Preoperational Test Procedure Review
IP 70305	Reactor Protection System Test Preoperational Test Procedure Review
IP 70311	Preoperational Testing Procedure Verification
IP 70312	Preoperational Test Witnessing
IP 70433	Chemical Control System Test - Preoperational Test Witnessing
IP 70439B	Component Cooling Water System Test - Preoperational Test Witnessing
IP 71302	Preoperational Test Program Implementation Verification
IP 79501	LWR Water Chemistry Control And Chemical Analysis – Audits
IP 84525	Quality Assurance and Confirmatory Measurements for In Plant Radiochemical Analysis (Preoperational and Supplemental)
IP 92701	Follow-up
TI 2500/20	Inspection To Determine Compliance with ATWS Rule, 10 CFR 50.62
TI 2515/109	Inspection Requirements for Generic Letter 89-10, Safety Related Motor Operated Valve Testing and Surveillance
TI 2512/036	Inspection of Watts Bar Nuclear Plant Environmental Qualification Special Program

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

49053	IP	Reactor Coolant Pressure Boundary Piping - Work Observation (Section C.1.2)
50073	IP	Reactor Coolant Pressure Boundary Piping - Work Observation (Section C.1.3)
50075	IP	Safety Related Components - Records Review (Section C.1.4)
51063	IP	Electric Cable - Work Observation (Section C.1.5)
79501	IP	LWR Water Chemistry Control And Chemical Analysis – Audits (Section CH.1.1)

84525	IP	Quality Assurance and Confirmatory Measurements for In Plant Radiochemical Analysis (Preoperational And Supplemental) (Section CH.1.2)
70305	IP	Reactor Protection System Test Preoperational Test Procedure Review (Section P.1.2)
70339	IP	Component Cooling Water System Test - Preoperational Test Procedure Review (Section P.1.4)
391/87-10	CDR	Failure of Category “C” Devices May Adversely Affect Category “A” Devices (Section OA.1.4)
Item 17	SSER Appendix HH	The NRC staff should verify the accuracy of the Unit 2 EQ list prior to fuel load (Section OA.1.5)
391/83-48	CDR	Relocating Sensing Lines on Upper Containment Cooler (Section OA.1.6)
2512/021	TI	Equipment Seismic Corrective Action Program (Section OA.1.7)
Item 67	SSER Appendix HH	TVA Should Confirm and NRC Staff Verify that Component Cooling Booster Pumps for U2 are Above PMF Level (Section OA.1.8)

Discussed

2500/20	TI	Inspection to Determine Compliance with ATWS Rule, 10 CFR 50.62 (Section OA.1.1)
2515/109	TI	Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance (Section OA.1.2)
2512/036	TI	Inspection of Watts Bar Nuclear Plant Environmental Qualification Special Program (Section OA.1.3)

LIST OF DOCUMENTS REVIEWED

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

C.1.6 Verification of As-Builts (Inspection Procedure 37051)

Documents

Integrated Cable & Raceway Design System, Cable Standard Report, 2PP662B, 5/21/14
Integrated Cable & Raceway Design System, Cable Standard Report, 2V4029B, 10/25/14
Integrated Cable & Raceway Design System, Cable Standard Report, 2V4011B, 10/25/14
Integrated Cable & Raceway Design System, Cable Standard Report, 2V2943B, 4/10/12
Integrated Cable & Raceway Design System, Raceway Standard Report, 2-5PP-292-2286B, 11/28/88
Integrated Cable & Raceway Design System, Raceway Standard Report, 2-5PP-292-2285B, 11/28/88

Diagrams/Drawings

Conduit & Grounding, Cable Tray Node Diagram, EL 737.0, 45W888-20, Rev. 6
Conduit & Grounding, Cable Tray Node Diagram, EL 713.0, 45W888-6, Rev. 1
Conduit & Grounding, Cable Tray Node Diagram, EL 713.0, 45W888-7, Rev. 2
Conduit & Grounding, Cable Tray Node Diagram, EL 757.0, 45W888-54, Rev. 11
Conduit & Grounding, Cable Tray Node Diagram, EL. 737.0, 45W888-32, Rev. 6
Conduit & Grounding, Cable Tray Node Diagram, EL. 713.0, 45W888-12, Rev. 5
Conduit & Grounding, Cable Tray Node Diagram, EL. 741.0, 45W886-12, Rev. 5
Conduit & Grounding, Cable Tray Node Diagram, EL. 737.0, 45W888-33, Rev. 6
Conduit & Grounding, Cable Tray Node Diagram, EL. 772.0, 45W888-72, Rev. 4
Conduit & Grounding, Cable Tray Node Diagram, EL. 772.0, 45W888-73, Rev. 2
Conduit & Grounding, Cable Tray Node Diagram, EL. 692.0, 45W888-3, Rev. 3
Conduit & Grounding, Cable Tray Node Diagram, EL. 757.0, 45W888-50, Rev. 3
Conduit & Grounding, Cable Tray Node Diagram, EL. 757.0, 45W888-51, Rev. 3
Conduit & Grounding, Cable Trays Plan & Details, EL.692.0, 45W880-11, Rev. 2
Conduit & Grounding, Conduit & Grounding Plan, EL. 729.0, 45W814-2, 3/1/93
Cable Tray Supports below EL. 713.0, 48W1295-2, Rev. 15
Cable/Wiring Separation Requirements Details, 45W3000-2

P.1 Pre-Operational Activities

P.1.2 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70305)

Pre-Operational Test Instructions

2-PTI-099-01, RPS and ESFAS Response Times, Rev. 0
2-PTI-099-03, RPS Operational Test, 2-PTI-099-04, Safeguard System Operational Test, Rev 0
2-PTI-099-04, Safeguard System Operational Test, Rev. 0
2-PTI-099-05, Overpower Delta–T and Overtemperature Delta–T Turbine Runback, Rev. 0
2-PTI-099-06, Reactor Protection Setpoint Verification, Rev. 0
2-PTI-099-08, Safeguards System Test Panel, Rev. 0

Miscellaneous

WBN2-99-4003, Reactor Protection System, Rev. 0
Westinghouse Document LTR-PCSA-11-21, "Watts Bar Unit 2 Precautions, Limitations and Set Points"; Dated: March 7, 2011.
PER 961025, (NRC Identified) "Acceptance Criteria Not Properly Verified in Section 6.3 of 2-PTI-099-04"
2-TSD-99-4, Rev. 2, "Test Scoping Document," dated 9/29/2011

Drawings

Drawing 2-112361-1082H70-1C, Rev. 0, "Electrical Functional Drawing (Safeguards) Four Loop, Four Bus Solid State Protection System"
Drawing 2-54114-1-7246D11-20, Rev. 1, "Electrical Solid State Protection System Interconnection Diagram"
Drawing 2-54114-1-7246D11-56, Rev. 0, "Electrical Solid State Protection System Interconnection Diagram"

P.1.3 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70311)

Documents Reviewed

2-TSD-67, Essential Raw Cooling Water (ERCW) System, Rev.10
WBN2-63-4002, Essential Raw Cooling Water System, System 67, Rev. 0003
Calculation WBN-OSG4-182, Functional Requirement of Mechanical Components in Systems 62, 63, 67, and 81, Rev.025
Calculation EPM-RM-070789, Valve Stroke Time Determination for System 67, Rev. 011
Drawing 2-47W845-2, Flow Diagram ERCW System, Rev.7
Drawing 2-45W760-67-4, Electrical Logic Diagram ERCW System, Rev. 0
Drawing 2-45W760-67-5, Electrical Logic Diagram ERCW System, Rev. 8
Drawing 2-45W760-67-6, Electrical Logic Diagram ERCW System, Rev. 9

P.1.4 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70339)

Documents Reviewed

WBN2-70-4002, System Description for Component Cooling System, Rev. 3
2-TSD-70-1, Component Cooling System (CCS) Test Scoping Document, Rev. 4
2-PTI-070-02B, Component Cooling System Unit 2 Train B Flow Balance, Rev. 1
Calculation EPMSME040790, "Component Cooling System Load List," Rev. 21
Calculation MDQ00007020090200, "Component Cooling System (CCS) Pressure Drop Calculation," Rev. 6
Drawing 1-47W859-1, Mechanical Flow Diagram Component Cooling System
Drawing 1-47W859-2, Mechanical Flow Diagram Component Cooling System
Drawing 1-47W859-4, Mechanical Flow Diagram Component Cooling System
DCN 64013

P.1.6 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70399)

Documents Reviewed

2-PTI-070-02B, "Component Cooling System Unit 2 Train B Flow Balance," Rev. 1
2-TSD-70-1, "Component Cooling System (CCS) Test Scoping Document," Rev. 4
WBN2-70-4002, "System Description for Component Cooling System," Rev. 3

Design Change Notice 64013
Drawing 1-47W859-1, Mechanical Flow Diagram Component Cooling System
Drawing 1-47W859-2, Mechanical Flow Diagram Component Cooling System
Drawing 1-47W859-4, Mechanical Flow Diagram Component Cooling System
SMP-9, Watts Bar Nuclear Plant Unit 2 Conduct of Test, Rev. 5
SMP-14.0, Watts Bar Nuclear Plant Unit 2 Test Deficiency Notices, Rev. 5
PER 951888
SR 952311
SR 952263
WO115447254

III. OPERATIONAL READINESS ACTIVITIES

CH.1 Chemistry Activities

CH.1.1 LWR Water Chemistry Control and Chemical Analysis Audits (Inspection Procedure 79501)

Procedures

CHDP-2, Conduct of Chemistry, Rev. 3
CHTP-108, Technical Chemistry Standards, Rev. 7
CHTP-109, CHEMISTRY QA/QC, Rev. 0008
Chemistry Manual Chapter 1, Chemistry Program Administration, Rev. 7
Chemistry Manual Chapter 3.01, System Chemistry Specifications, Rev. 95
RCDP-2, Reactor Coolant Chemistry, Rev. 0007
Chemistry Manual Chapter 6.49, Operation of the SWAN On-Line Sodium Analyzer, Rev. 3
Chemistry Manual Chapter 6.65, Operation of the Polymetron On-Line Hydrazine Analyzer, Rev. 3
Chemistry Manual Chapter 9.40, CAS Quality Control Functions, Rev. 1

Transition Documents

2-CM-1.01, Primary Chemistry Program Strategic Plan, Rev. 0
White Paper: Interface Responsibilities among construction and operating organizations
White Paper: Chemistry Modifications to Improve Chemistry control and online chemistry monitoring
Chemistry Department Transition and Change Management Plan for Two-Unit Operations at Watts Bar Nuclear Plant, Rev. 5
White Paper: WBN 2 Supplemental Chemistry Recommendations for Startup and Operation
White Paper: Unit 2 Rad Monitors Differences
Spreadsheet: Chemistry Action Tracking Matrix Report

Audits and Assessments

WBN-CEM-12-BM04, Bench Marking trip Vogtle, 4/23/2012
WBN-CEM-S-12-001, Snapshot Self-Assessment, U1C11 Primary Chemistry End of Cycle Review, 11/30/2012
WBN-CEM-S-12-002, Snapshot Self-Assessment, Secondary Chemistry, 10/15/2012
WBN-CEM-S-12-003, Snapshot Self-Assessment, QA/AC End of Cycle 10 Trend Review, 9/25/2012
WBN-CEM-S-12-004, Snapshot Self-Assessment, Balance of Plant Chemistry Control, 9/30/2012

WBN-CEM-S-12-005, Snapshot Self-Assessment, Diesel Fuel Oil and Diesel Cooling Water Chemistry Control during U1C11 Review, 9/30/2012
WBN-CEM-S-12-009, Chemistry Data Entry Error Snapshot Self-Assessment, Rev 1, 11/13/2012
WBN-CEM-S-13-001, Snapshot Self-Assessment Chemical Traffic Control, 4/1/2013
WBN-CEM-S-13-003, Snapshot Self-Assessment SOER 03-2 Managing Core Design Changes, Recommendation 2, 7/17/2013
WBN-CEM-S-13-004, Snapshot Self-Assessment SOER 07-2 Intake Cooling Water Recommendations 1 and 2, 7/17/2013
WBN-CEM-S-13-005, Snapshot Self-Assessment SOER 93-1, Recommendation 3, 4/2/2013
WBN-CEM-S-14-012, Snapshot Self-Assessment Chemical Traffic Control, 4/25/2014
PER 846059, Issue with Steam Generator Blowdown design configuration noted in the final U1/U2 assessment.
Steam Generator Blowdown Model Evaluation (addresses PER 846059)

Records

Chemistry Technician Intralaboratory Sample Program Analysis Results Matrix [blind spike sample analysis], 9/2012 through 9/2014
PER 903632, Two analysts failed to meet minimum acceptable NWT Non-radioactive blind sample bias values for sulfate, silica, copper, and lithium.

CH.1.2 Quality Assurance and Confirmatory Measurements for In Plant Radiochemical Analysis (Inspection Procedure 84525)

Procedures

Chemistry Manual 2-CM-1.01, Primary Chemistry Program Strategic Plan, DRAFT Rev. 0
Chemistry Manual CM-8.02, Chemistry Quality Assurance and Control Program, Rev. 15
Chemistry Manual Chapter 8.03, Determination of Limits of Detection and Limits of Quantification, Rev. 12
Chemistry Manual Chapter 8.04, Nonradiochemical Control Chart Preparation and Use, Rev. 18
Chemistry Manual Chapter 8.05, Intralaboratory and Interlaboratory Sample Program, Rev. 16
Chemistry Manual CM-8.08, QA/QC Program for On-Line Process Instrumentation, Rev. 18
Chemistry Manual Chapter 9.02, Chemistry Countroom Quality Assurance and Control Program, Rev. 18
Chemistry Manual Chapter 9.32, I.G. Detector Efficiency Calibration, Rev. 7
Chemistry Manual CM 9.33, I.G. Detector Quality Control Data Collection, Rev. 17
Chemistry Manual Chapter 9.40, CAS Quality Control Functions, Rev. 1
Chemistry Manual Chapter 9.60, Setup and Calibration Of The Liquid Scintillation Counter, Rev. 11
Chemistry Manual Chapter 13.0, Post-Accident Sampling and Analysis Chapter Administration, Rev. 15
Chemistry Manual Chapter 13.02, Radiochemical Laboratory Setup, Rev. 7
Chemistry Manual Chapter 13.13, Transport of Post-Accident Samples, Rev. 2
Chemistry Manual Chapter 13.17, Preparation of Shield Building Post-Accident Samples for Tritium Determination, Rev. 1
Chemistry Manual Chapter 13.18, Post-Accident Sampling in the Unit 2 Hot Sample Room, Rev. 0
NPG System Description Document N3-43B-4001, Sampling and Water Quality System Post Accident Sampling Facility, Rev. 0034
Technical Instruction TI-269, Post-Accident Sampling Program, Rev. 0001

Records

Aggregated control chart and QA data covering December 2012 through November 2014.
Daily control chart, TriCarb 3100B Liquid Scintillation Counter, S/N 060487, 1/1/2014 – 12/2/2014
Gamma Spectroscopy Detector Efficiency Calibration, Detector ID GSS-9762 (Detector 1), 1/27/2014
Gamma Spectroscopy Detector Efficiency Calibration, Detector ID GSS-9278 (Detector 2), 6/15/2010
Gamma Spectroscopy Detector Efficiency Calibration, Detector ID GSS-2897 (Detector 5), 11/24/2008
Gamma Spectroscopy Detector Annual Confirmation, Detector ID GSS-9278 (Detector 2), 7/2/2013
Gamma Spectroscopy Detector Annual Confirmation, Detector ID GSS-9409 (Detector 3), 7/1/2013
Gamma Spectroscopy Detector Annual Confirmation, Detector ID GSS-3850 (Detector 4), 7/1/2013
Gamma Spectroscopy Detector Annual Confirmation, Detector ID GSS-2897 (Detector 5), 7/1/2013
PER 963885, TriCarb Trending not observed

IV. OTHER ACTIVITES

OA.1 Inspection to Determine Compliance with ATWS Rule, 10 CFR 50.62 (Temporary Instruction 2500/20)

Drawings

2-45W600-3-15, Wiring Diagrams Main & Auxiliary Feedwater Sys schematic diagram, Rev. 3
2-45W600-57-26, Wiring Diagrams Separation & Misc Aux Relays schematic diagram, Rev. 7
08F826663-RL-3201, Rack Loading Auxiliary Control Room Rack 2-L-11B, Train “B”, Rev. 2
DRA 52671-055, Rev. 3
2-47W610-3-6, Electrical Control Diagram Main & Aux Feedwater System, Rev. 2
DRA 52343-146, Rev. 0
797492, O&MD Control Instrumentation enclosure, Rev. b
45W822-16, Conduit & grounding el 692.0 Details sh 6, Rev. 17
2-47W605-175, Annunciator Light boxes Demarcation Nameplate Locations, Rev. 2
2-45W2696-1 Electrical Wiring Diagram AMSAC PNL 2-R-178 Connection Diagram, Rev. 0
45N2692-1, Wiring Diagrams, Separation Aux Relay PNL 2-R-77 Connection Diagrams SH 1, Rev. 12
DRA 52408-012, Rev. 0
45N2689-1, Wiring Diagrams, Separation Aux Relay PNL 2-R-74 Connection Diagrams SH 1, Rev. 10
2-45W600-47-2, Wiring Diagram Turbo-Generator Auxiliaries Schematic Diagrams, Rev. 116
DRA 52408-013, Rev. 0
45N2685-1, Wiring Diagrams, Turbo-Gen Aux Relay PNL 2-R-70 Connection Diagrams SH 1, Rev. 1
DRA 52408-006, Wiring Diagram PNL 2-R-178 Connection Diagram, Rev. 2
2-45W269601A Electrical Wiring Diagram AMSAC PNL 2-R-178 Connection Diagram, Rev. 1
71994, AMSAC Panel Wiring Diagram, Rev. F
71995, AMSAC Panel General Arrangement, Rev. C
71992, AMSAC Panel Outline Dimension, Rev. E
2-45B655-4A, Main Control Room Annunciator Inputs Window Box XA-55-4A, Rev. 4
2-45B655-4C, Main Control Room Annunciator Inputs Window Box XA-55-4C, Rev. 2

2-47W605-53, Electrical Layout of Control Board Panel 2-M-4, Rev. 1
2-45B655-E4A, Electrical Annunciator Window Box XA-55-4A Engraving, Rev. 2
2-45B655-E4C, Electrical Annunciator Window Box XA-55-4C Engraving, Rev. 2
DRA 52360-53, Electrical Layout of Control Board Panel 2-M-3, Rev. 3
2-45B640-315, Contact Development of Control and Instrument Switches, Rev. 0
DRA 52408-014, Rev. 0

Procedures

2-IMI-3.005, 18 Month Calibration of Anticipated Transient Without Scram (ATWS) Mitigation System Actuation Circuitry (AMSAC), Rev. 0000

Miscellaneous

3-OT-FRS0001, Functional Restoration Guidelines—FR-S.1, & S.2, Rev. 14

OA.1.2 Safety Related Motor Operated Valve (MOV) Testing and Surveillance (GL 89-10) (TI 2515/109, Inspection Procedures 50073, 51053)

Work Orders
WO 114900428, Chemical and Volume Control System High Pressure Safety Injection Motor Operated Valve Dynamic Test, 2-TI-85.007

Calculations
MDQ0020622008-0222, Design Basis Review, Required Thrust/Torque Calculations and Valve and Actuator Capability Assessment for Valve 2-FCV-062-090

Miscellaneous
EWR14COM999201, Maximum Allowed Motor Starts for Safety Related MOVs, 2/6/2014
T25110217641, Westinghouse MOV Coefficient of Friction and Seat Diameter Coefficients of Friction Qualifying Basis and Mean Seat Diameters of Motor Operated Gate Valves, January 27, 2011

OA.1.3 Environmental Qualification Special Program (Temporary Instruction (TI) 2512/036)

Environmental Qualification Data Packages (EQDP)

WBNEQ-IZS-005, NAMCO EA Limit Switches Manufactured After December 1986
WBNEQ-MOT-001, Westinghouse 6.9 KV Motors on RHR, CVCS, CS and SIS
WBNEQ-MOT-007, TVA Form-Wound Medium Voltage Motor Insulation System
WBNEQ-CABL-050, BRAND_REX Power & Control Cable-XLPE INS/TVA Type PXJ and PXMJ
WBNEQ-CABL-051, OKONITE Power & Control Cable-XLPE INS/TVA Type PXJ and PXMJ
WBNEQ-CABL-053, ROCKBESTOS Power & Control Cable-XLPE (Chemical) INS/TVA Type PXJ and PXMJ
WBNEQ-ILT-002, GOULD/STATHAM Level Transmitters

EQ Change Supplements (EQCS)

WBNEQ-IZS-005-52943
WBNEQ-IZS-005-53537
WBNEQ-IZS-005-53421
WBNEQ-IZS-005-54070
WBNEQ-MOT-001-52640

WBNEQ-MOT-001-53580
WBNEQ-MOT-007-54070
WBNEQ-CABL-050-53785
WBNEQ-CABL-050-54912
WBNEQ-CABL-053-55121
WBNEQ-CABL-053-54903
WBNEQ-CABL-053-55231
WBNEQ-CABL-053-53711

EQ Information Releases (EQIR)

WBNEQ-IZS-005-11029
WBNEQ-IZS-005-13063
WBNEQ-MOT-001-14066
WBNEQ-CABL-050-13071
WBNEQ-CABL-051-3071
WBNEQ-CABL-051-14069
WBNEQ-CABL-051-14070
WBNEQ-CABL-053-13062
WBNEQ-CABL-053-13004
WBNEQ-CSC-005-11029
WBNEQ-CSC-005-11042
WBNEQ-CSC-005-13066
WBNEQ-ILT-002-12074
WBNEQ-XMTR-008-13057

Miscellaneous

25402-3DP-GEE-00001-003, Engineering Department Procedure Instruction Equipment Environmental Qualification Program, dated 6/28/12
NEDP-2, NPG Standard Department Procedure, Design Calculation Process Control, Rev. 0018
NEDP-5, NPG Standard Department Procedure, Design Document Reviews, Rev. 0010
DS-M18.14.1, Engineering Design Guide/Standard, Design Standard for Environmental Qualification of Electrical Equipment in Harsh Environment, Rev. 0003
B26 980223 300, Material Aging Analysis for GULTON-STATHAM Transmitter (WBNEQ-ILT-002, Rev. 03
2-45N2630-23, Wiring Diagrams Miscellaneous Connection Diagrams – Sheet 23 revision dated 10/14/14
WBNOSG4013, “Chemical and Volume Control System (62) NUREG-0588 Category and Operating Times,” Revision 27, Dated 6/18/2014
WBNOSG4008, “Containment Ventilation System (30) NUREG-0588 Category and Operating Times,” Revision 33, dated 6/12/2014
CATC030, “Failure Analysis of System 030 (Ventilation) Category “C” Devices,” Revision 3, dated 6/23/2014
CATC062, “Failure Analysis of System 062 (Chemical and Volume Control) Category “C” Devices,” Revision 1, dated 6/16/2014
EDCR 54797, Rev. A, dated 4/20/201
EDCR 52419 – A, dated 3-5-09
2-45W760-30-9, “Wiring Diagrams Ventilating Systems Schematic Diagrams SH-9,” Revision 12, dated 12/11/2008
2-45W760-30-10, “Wiring Diagrams Ventilating Systems Schematic Diagrams SH-9,” Revision 10, dated 12/11/2008
WO 112763656, “CCE EDCR2 53069 SYS 212 2-BD-212-B002-B Install Electrical Components in 2-BD-212-B002-B,” dated 6/2012

WO 110822037, “CCE EDCR2 53069 SYS 30 212 270 2-BD-212-B002-B,” dated 2/2011
Service Request 966198, “NRC Identified EQ Binder LT-002 typo”

OA.1.6CDR 391/83-48: Relocating Sensing Lines on Upper Containment Cooler (Inspection Procedure 92701)

Drawings

2-47A900-58D
2-47A900-58E
2-47W866-1, Flow Diagram Heating and Ventilation Air Flow, Rev. 19
2-47W915-3, Mechanical, Ventilation and Air Conditioning, Rev. 38

OA.1.7 Inspection of Watts Bar Nuclear Plant Equipment Seismic Corrective Action Program Plan (Temporary Instruction 2512/021, Inspection Procedures 51053, 51055, 52053, 52055, 50073, and 37051)

Work Order

WO 08-952689-000 Rev 3
WO 111639067- Chiller Installation
WO 111238666, Essential Raw Cooling Water Pump H-B
WO 112498303, CCH SYS 062 WBN-2-PIPE-062-B ASME HYDROTEST 2-062-47W809-1-2-B01A
WO 112800212, CCM PER 589508/706112 SYS 062 070 2-HTX-062-0066 Perform Eddy Current Testing of Ht. Exch.
WO 114211849, CCM SYS 062 SYS 070 WBN-2-HTX-062-0066 Left Shell From Tubesheet to Support Re-Rating
WO 114225269, CCM PER 589508 ASME III SYS 062 WBN-2-HTX-062-0066 Seal Water HTX
WO 114660182, CCH SYS 070 WBN 2-PIPE-070-C Hydrotest 2-070-47W859-1-B2-2-RETEST 2
WO 08-812562-011, “Implement DCN 52285 – Fabricate Inverter Supports and Install Inverter 2-INV-235-3-F,” completed 9/16/2009
WO 09-951671-003 rev 3 dated 11/23/10
WO 112464403
WO 112982210
WO 112558274
WO 112717163
WO 112068525

EDCR

EDCR 54873, Rev. A, “Structural Modifications to Unit 2 Containment Purge Air Exhaust Plenums WBN-2-PLM-030-0001E and 0004E,” dated 3/5/2010
EDCR 54923-A
EDCR 54923-A
EDCR 53763-B
EDCR 54923-A
EDCR 52351-B

Calculation and Analysis

WCG-1-1292, Anchorage Evaluation of Worst Cases for Heat Exchangers PKG-3, T93110406007. Rev. 003
WCG-ACQ-1173, Development of RRS For WBN Unit 1 Devices/Components/Equipment, T93110406007. Rev. 006
Westinghouse EQ-QR-68-WBT-P, "Qualification Summary Report for Post-Accident Monitoring System (PAMS)," Rev. 0
Westinghouse CN-EQT-10-44-P, "Dynamic Similarity Analysis for the Watts Bar Unit 2 Post Accident Monitoring System (PAMS)," Rev. 1
Westinghouse EQLR-171-P, "Environmental and Seismic Test Report Analog Input (AI) 687 and AI688 Modules and Supporting Components for use in Common Qualified (Common Q) Post Accident Monitoring System (PAMS)," Rev. 1
Westinghouse WCAP-8540, "Seismic Qualification of the Full Size Main Control Boards Sequoyah and Watts Bar Nuclear Power Plants," dated May 1975
Westinghouse WCAP-9981, "Similarity Methods and Criteria for Seismic Evaluation of Electrical Equipment," dated October 1981.
Anchorage Evaluation of Worst Cases for Heat Exchangers PKG-3, T95101011503, Rev. 02
Vendor Report 25402-011-V1A-MPVT-00055-005, Seismic Qualification Analysis for 30CC 2-Stage Vertical Essential Raw Cooling Water (ERCW) Pumps
Vendor Report 25402-011-V1A-MPVT-00064-003, Mechanical Calculations for 30CC 2 Stage Vertical Pump
Vendor Report 25402-011-V1A-MPVT-00062-004, Rotodynamic Analysis for 30CC 2 Stage Vertical Essential Raw Cooling Water (ERCW) Pumps
Vendor Report 25402-011-V1A-MPVT-00063-006, Design Report – ASME Pressure Vessel Calculations ERCW 30 CC 2-Stage
ERCW Pump Qualification, Nozzle Loads, EDMS#T93090220002
Vendor Report for the ERCW Motor, EL 8-5017-90245-01, B07890915016
Vendor Report: 25402-011-V1A-ME00-00001-001, Design Report Seal Water Heat Exchanger
Calculation WCG-1-701, Rev. 002, "Plenum Qualification for CAQ WBPER 910153," dated 1/28/2013
Calculation WCG-2-0349, Rev. 4, "WBN2 Seismic Category I(L) Conduit and Supports walkthrough Screening Evaluation Guidelines," dated 10/24/2012
Calculation WCG-2-0409, "Rev. 002, "WBN2 Seismic Category I(L) Equipment Failure & Falling) Walkthrough Screening Evaluation Guidelines," dated 10/24/2012
Calculation WCG-ACQ-0586, Rev. 002, "Seismic Qualification of Diesel Generator Building Battery Charger Anchorage," dated 6/11/2011
Calculation WCG-ACQ-1007, Rev. 1, "Seismic Qualification of Unit 2 Inverter Panel Anchorage," dated 8/28/2009
Report CEB-74-4, Rev. 2, "Watts Bar Nuclear Plant – Dynamic Earthquake Analysis of the Diesel Generator Building and Response Spectra for Attached Equipment," dated 4/9/1991
Test Report - QualTech NP Q0037.0, Rev. 1, "Seismic Qualification Report for an Ametek Solidstate Controls Battery Charger," dated 12/16//2010
Test Report - Wylie Laboratories 51133-1, "Seismic Testing of a 20 KVA UPS System," dated 8/24/2004
NEDP-9 Seismic/Structural Qualification rev 0011 dated 11/21/2012
Emerson- Certificate of Conformance 3" Class 1500 SS-95 Valve Assembly 25402-011-V1A-MG00-04122-003 rev D dated 06/01/2011
Emerson- Design Report for Class 1 Components per ASME Section III, Division 1, 1971 Ed., S1972 Add. Rev G dated 06/01/2011
S/SQ Review/Approval Memo T97120417007 dated 03/21/2012
S/SQ Review/Approval Memo T97110524001 dated 05/23/2011
Calculation WCG-2-792, BN2 Seismic Category 1(L) Equipment (Failure and Falling) Program Closure Summary Calculation, rev 001 dated 10/05/2011

Calculation WCG-2-409, BN2 Seismic Category 1(L) Equipment (Failure and Falling)
S/SQ Review/Approval Memo T97120216001 dated 02/15/2012
Emerson- Fisher Controls Seismic Analysis of Control Valve Assemblies 25401-011-V1E-JV15-00004-005 rev M dated 08/01/2002
Emerson- Fisher Controls Seismic Analysis for 8in Class 150 A11 Valve Assembly 25402-011-V1E-00006-005 rev F dated 02/04/2012
Baldor Seismic Analysis Report 25402-011-V1C-MUMI-00024-002 rev 1 dated 10/22/10
UDRI-TR-76-56A Ellis and Watts Cooling Units Seismic Report dated 09/30/1976

Walk-down Package

LWSD-3149 (Limited Scope Walkdown Package) WBN2 Seismic Category 1(L) Equipment (Failure and Falling) rev 001 dated 10/04/2011
Walkdown Package WBN2-C-030-1420-00 Rev 0 dated 11/12/2008
WP NO. WBN2-C-062-1405-00, Rev. 0, Document Identification, Anchorage and Mounting Detail on Heat Exchanger: Letdown Heat Exchanger#WBN-2-HTX-062-0124; Excess Letdown Heat Exchanger#WBN-2-HTX-062-0121; CVCS Seal Water Heat Exchanger#WBN-2-HTX-062-0066
Limited Scope Walkdown LSWD-3160, Rev. 0, “WBN2 Seismic Category I(L) Equipment (Failure & Falling),” dated 12/23/2009
Limited Scope Walkdown LSWD-3062, Rev. 0, “WBN2 Seismic Category I(L) Conduit and Supports,” dated 12/23/2009

Specifications

TVA Design Specification for the Essential Raw Cooling Water Pumps, WBNP-DS-1925-2260-R5

Drawings

Vendor Drawing PCS366575-01, ERCW Pump Sectional
Drawing 37W206-1, Mechanical Intake Pumping Station Piping and Equipment
Drawing: D-4068-6, 10-128 Seal Water Heat Exchanger, Rev. 06, 7/10/1975
Drawing: 48N948, Miscellaneous Steel Equipment Support Sheet 1, Rev. 15, 4/7/88
Drawing 47W920-25, DRA 54873-001, Rev. 1, “Purge Air Exhaust Plenum,” dated 11/4/2011;
Drawing 47W920-25, DRA 54873-002, Rev. 1, “Purge Air Exhaust Plenum Sections and Details,” dated 11/16/2011
Drawing Revision Authorizations 52285-114, -115, and -116, Rev. 1, “Anchorage for Inverter Panel 2-INV-235-1-D (PIC 53473-04)”
Drawing Revision Authorization 55076-401, Rev. 1, Diesel Generator Room 2A-A, dated 5/23/2011
Vendor Drawing - Ametek 10-107962, Rev. E, “Outline 20KVA UPS System Door and Breaker Panels,” dated 9/30/2004
Vendor Drawing - Ametek 10-111724, Rev. (None), “Outline Dual 20 Amp Battery Chargers (Sheet 1 of 2),” dated 7/10/2010
Drawing 2-47W865-105 Flow Diagram Air Conditioning Chilled Water rev M dated 08/25/2012
Drawing Emersen GE51665 rev G dated 02/17/2012
Drawing: “T.V.A. Air Cooling Units 23AR thru 23PL” Sheets 1-3 rev 902 dated 08/19/1976
Drawing: 47W200-6, Equipment Plan – EL 692 & EL 685.5 rev F dated 09/16/1976
Westinghouse 10047E63, “Watts Bar Unit 2 Post Accident Monitoring System (PAMS) Cabinet Assembly,” Rev. 3
Bechtel 10047E60-1, “DRA Number 52351-002,” Rev. 2
Westinghouse 3D91880, “Standard Safety Next Generation PC Node Box Assembly”, Sheet 1-3

Problem Evaluation Report (PERs)

PER 145171 dated 2/12/2014

Procedures and Standards

General Design Criteria WB-DC-40-31.13, Seismic/Structural Qualification of Seismic Category I(L) Electrical and Mechanical Equipment, Rev. 08
General Design Criteria WB-DC-40-31.6, Seismic/Structural Qualification of Seismic Category I and I(L) Tank and Vessel Assemblies, Rev. 10
Guidelines and Methodology for Assembling and Tensioning Threaded Connections, MMTP-104, Rev. 06, 2/4/14
WB-DC-40-31.12 Seismic/Structural Qualification of Seismic Category 1 and 1(L) In-Line Valves and Other In-Line Fluid System Components rev 11 dated 05/10/2012
WB-DC-40-31.12 Seismic/Structural Qualification of Seismic Category 1 and 1(L) In-Line Valves and Other In-Line Fluid System Components rev 11 dated 05/10/2012
Walkthrough Screening Evaluation Guidelines, rev 002 dated 10/24/2012
WB-DC-40-31.13 Seismic/Structural Qualification of Seismic Category 1(L) Electrical and Mechanical Equipment, rev 8 dated 02-02-2010
WB-DC-40-31.2 WBNP Seismic/Structural Qualification of Seismic Category 1 Electrical and Mechanical Components, rev 14 dated 08/01/12

Miscellaneous

DCN 55076, Rev. A, “Replace Diesel Generator Battery Chargers with Dual Chargers per Generator Set,” dated 2/10/2011
Procurement Request SL-E-0119, Rev. 0, “Diesel Generators 125 VDC Battery Chargers,” dated 4/9/2010
Vendor Manual - AMETEK Solidstate Controls, Rev. B, “Instruction & Operating Manual with Drawings – Tennessee Valley Authority Watts Bar Nuclear Purchase Order 00069414 (Project C95322),” dated 1/21/2009
Vendor Manual - AMETEK Solidstate Controls, Revision (Preliminary), “Instruction/ Technical Manual (TVA P.O. 00034327)”

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AMSAC	ATWS mitigation system actuation circuitry
ATWS	Anticipated transient without scram
CAP	Corrective Action Program
CATD	Corrective action tracking document
CDR	Construction Deficiency Report
CFR	Code of Federal Regulations
EDCR	Engineering Document Construction Release
EQ	Environmental Qualification
EQDP	Environmental Qualification Data Packages
EQIR	EQ Information Releases
EQCS	EQ Change Supplements
ERCW	Emergency Raw Cooling Water
ESQ	Equipment seismic qualification
SAR	Safety Analysis Report
SER	Safety Evaluation Report
GL	Generic Letter
IMC	Inspection Manual Chapter (NRC)
IP	Inspection Procedure (NRC)
IIR	Integrated Inspection Report
MEL	Master equipment list
M&TE	Measuring and Test Equipment
MOV	Motor Operated Valve
No.	Number
NPP	Nuclear Performance Plan
NRC	Nuclear Regulatory Commission
PER	Problem Evaluation Report
PMF	Probable maximum flood
PTI	Pre-Operational Test Instruction
QA	Quality Assurance
QC	Quality Control
RCS	Reactor coolant system
Rev.	Revision
RPS	Reactor protection system
SALP	Systematic Assessment of Licensee Performance
SP	Special Programs
SSER	Supplemental Safety Evaluation Report
TI	Temporary Instruction (NRC)
TVA	Tennessee Valley Authority
URI	Unresolved Item
U2	Unit 2
VIO	Violation
WBN	Watts Bar Nuclear Plant
WO	Work Order