



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

December 29, 2014

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

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2014614**

Dear Mr. Skaggs:

On November 15, 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 December 9, 2014, 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 05000391/2014614
w/Attachment

cc w/encl: (See next page)

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cc w/encl: (See next page)
 * Previous Concurrence

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Letter to Michael D. Skaggs from Robert C. Haag dated December 29, 2014.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2014614

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2014614

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: Spring City, TN 37381

Dates: October 1 – November 15, 2014

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

Enclosure

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 two construction deficiency reports (CDRs), one unresolved item (URI), one temporary instruction (TI), one inspection procedures (IP), two IP sections, one Three Mile Island (TMI) action item, and three 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; containment penetrations; electrical systems and components; cable issues corrective action program; environmental protection; preoperational testing activities; fire protection; and various NRC inspection procedures.

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REPORT DETAILS

Summary of Plant Status

During the inspection period covered by this report, Tennessee Valley Authority (TVA) performed construction completion and preoperational testing activities on safety-related systems and continued engineering design activities of the Watts Bar Nuclear (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 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.

Specific work activities observed included work associated with:

- WO 111735249, Auxiliary Building Refuel Floor Crane Lifts
- WO 115447949, System 070 Component Cooling System, 2-PTI-070-2A, Component Cooling System Unit 2 Train A Flow Balance

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.

C.1.2 As-built Cable Terminations (Inspection Procedures 51063 and 37051)

a. Inspection Scope

The inspectors observed the termination and inspected the as-built terminations of cables 2PP662B (auxiliary feedwater pump B) and 2PP650A (auxiliary feedwater pump A). The inspectors verified location, cable types, cable identification, cable bend radius, and the creation of the terminations for 2PP622B at the motor and panel. The inspectors also verified location, cable types, cable identification for the termination of 2PP650A at the motor and panel, and verified that the terminations were in accordance with design drawings.

The inspectors also observed the terminations of cables 2V4011B and 2V4029B at both termination points. The inspectors verified location, cable types, cable identification, and bend radius, and verified that the terminations were in accordance with design drawings.

The inspectors observed the terminations of cable 2V4943 at motor control center 2-MCC-213-B2/2A-B and the PNL 276-L222/A. The inspectors also observed the splicing of the cable at junction box 20JB-292-8573-B. The inspectors verified location, cable types, cable identification, and bend radius, and verified that the terminations were in accordance with design drawings.

Documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings were identified.

c. Conclusions

The cables were terminated in accordance with design drawings.

C.1.3 Raceway Walkdowns (Inspection Procedures 51063, 51053, and 37051)

a. Inspection Scope

The inspectors performed as-built walkdowns of Class 1E cable trays with raceway identification numbers 4A 1924:1949 and 4A 1936:1950, which were located in the reactor building. The inspectors verified that the drawings matched the as-built condition by examining the physical location and routing, the location of supports, the physical separation and isolation, the tray loading (ampacity, thermal, and mass), and identification. Additionally, the inspectors reviewed applicant documents to support the as-built verification. The documents reviewed included calculations, drawings, procedures, and specifications.

The following samples were inspected:

- IP 51063 Section 02.03.a - 2 samples
- IP 51053 Section 02.02.f - 2 samples
- IP 37051 Section 02.01.b.2 - 2 samples

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

The inspectors concluded that the raceways were adequately installed.

C.1.4 Reactor Vessel and Internals Work Observation (Inspection Procedure 50053)

a. Inspection Scope

The inspectors continued to monitor in-place storage of the reactor pressure vessel. The reactor pressure vessel, internals, core barrel, and reactor head were assembled during the third quarter of 2014; therefore, in-place and installed storage inspections of these components were limited as recommended by IP 50053 and could not be accomplished in their entirety due to the inaccessibility of the reactor pressure vessel components during this time. However, the inspectors did verify access controls to assure only authorized entry of tools, equipment, and personnel; and verified cleanliness requirements were being met.

b. Observation and Findings

No findings were identified.

c. Conclusion

Quarterly inspection of the reactor pressure vessel storage was limited due to inaccessibility as a result of the components having been assembled. For the areas inspected, adequate controls were in place to protect the exterior portions of the reactor vessel.

C.1.5 Piping – Work Observations (Inspection Procedure 49063)

a. Inspection Scope

The inspectors reviewed the engineering evaluation associated with PERs 763877 and 823432; and interviewed cognizant personnel to verify the cleanliness evaluation and the use of a gravity drain flush for the containment spray system and residual heat removal system spray header was acceptable in accordance with TVA procedure N3M-938, "Cleaning and Cleanliness of Fluid System Components." The inspectors also verified that flushing activities met the intent of American National Standards Institute (ANSI) N45.2.1, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants," 1973.

Documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings were identified.

c. Conclusions

The inspectors concluded that clean plans were being implemented adequately and issues with cleanliness were evaluated and dispositioned in accordance with engineering and ANSI standards.

C.1.6 (Closed) Electrical Components and Systems – Work Observation (Inspection Procedure 51053)

a. Inspection Scope

Background: As described in 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 plant. 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 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 (ADAMS Accession No. ML091210420), Attachment 2, documented the reconstitution results for IP 51053 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 Section 02.01.b, Raceway Systems (2.02.a and 2.02.b portions); Section 2.01.e, Distribution, Control, and Protective Apparatus (2.02.e, f, and g portions); and Section 2.01.f, Other Electrical Components (2.02.f portion) should be performed. Section 2.01.c Emergency Diesel Generator and Section 2.01.d DC systems were excluded from review since these systems had been previously inspected prior to 2008, were turned over to Unit 1 control, and therefore inspected as part of the ongoing baseline inspection program for Unit 1.

Inspection Activities: The purpose of this IP was to verify, by direct observation and independent evaluation of work performance, work in progress, and completed work, that activities relative to safety-related electrical systems and components were controlled and accomplished in accordance with NRC requirements, safety analysis report (SAR) commitments, and applicant procedures. This IP included receiving inspections, storage, handling, in-process installation, completed work, as-built verification, and construction testing, as applicable. This IP applied to safety-related electrical equipment such as: raceways, raceway hangers and other supports, switchgear, motor control centers, transformers, batteries and racks, battery chargers, inverters, motor-generator sets, electrical penetration assemblies, motors, electric valve operators, local cabinets, limit switches, solenoid valves, and protective devices.

In this report period the inspectors performed as-built walkdowns of pressurizer power-operated relief valve (PORV) block valves 2-FCV68-333-A and 2-FCV-68-332-B and an as-built walkdown of the charging flow isolation valve 2-FCV-062-0091-B. The valves inspected were motor-operated valves. The inspectors compared construction installation drawings and associated installation documentation against the actual installation of the components. The inspectors performed this comparison to determine whether components, shown on the drawing, were of the type specified and whether they had been installed, located, oriented, supported, and protected in accordance with the drawings.

The inspectors verified the status of design changes on the selected drawings to determine whether the applicant properly controlled and documented changes for engineering review, approval, and subsequent incorporation into the as-built drawings.

Documents reviewed are listed in the Attachment.

The following samples were inspected:

- IP 51053 Section 02.02.f – 3 samples (Other Electrical Components)

The following tables list the inspections that were performed under this IP and documented in earlier inspection reports. The inspections are grouped by the different subsections in 02.01 of the IP (Raceway Systems; Distribution, Control, and Protective Apparatus; and Other Electrical Components).

02.01.b Raceway Systems (Conduits for A and B trains, Conduit Supports, Cable Trays)

IP Section	Inspection Reports	ADAMS Accession Number
02.02.a Receiving Inspections	<ul style="list-style-type: none"> • 05000391/2013603, Section C.1.7 • 05000391/2010602, Section C.1.4* 	<ul style="list-style-type: none"> • ML13134A239 • ML101230144
02.02.b Storage	<ul style="list-style-type: none"> • 05000391/2013603, Section C.1.7 • 05000391/2014603, Section C.1.3 	<ul style="list-style-type: none"> • ML13134A239 • ML14129A381
02.02.d In-Process Installation	<ul style="list-style-type: none"> • 05000391/2010604, Section C.1.14 • 05000391/2010605, Section C.1.17 • 05000391/2011607, Sections C.1.7 and C.1.12 • 05000391/2012609, Section C.1.6 	<ul style="list-style-type: none"> • ML103060240 • ML110410680 • ML112730197 • ML12356A073
02.02.e Completed Work	<ul style="list-style-type: none"> • 05000391/2010602, Section C.1.4 • 05000391/2010604, Section C.1.14 • 05000391/2011605, Section OA.1.1 • 05000391/2011607, Section C.1.9 and C.1.12 • 05000391/2012609, Section C.1.6 	<ul style="list-style-type: none"> • ML101230144 • ML103060240 • ML112201418 • ML112730197 • ML12356A073
02.02.f As-Built Verification	<ul style="list-style-type: none"> • 05000391/2011605, Section OA.1.1 • 05000391/2012607, Section OA.1.1 • 05000391/2014603, Section C.1.7 • 05000391/2014607, Section OA.1.8 • 05000391/2014614 Section C.1.3 	<ul style="list-style-type: none"> • ML112201418 • ML12276A028 • ML14129A381 • ML14274A076

02.01.e Distribution, Control, and Protective Apparatus (Motor Starter, Motor Control Center (MCC) Breakers, Relays, MCC Buckets, Pumps Motors)

IP Section	Inspection Reports	ADAMS Accession Number
02.02.b Storage	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.5 	<ul style="list-style-type: none"> • ML112201418
02.02.c Handling	<ul style="list-style-type: none"> • 05000391/2010602, Section C.1.6 	<ul style="list-style-type: none"> • ML101230144

	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.5 • 05000391/2011609, Section C.1.2 	<ul style="list-style-type: none"> • ML112201418 • ML11350A229
02.02.d In-Process Installation	<ul style="list-style-type: none"> • 05000391/2010605, Section C.1.13 • 05000391/2011602, Section C.1.9 • 05000391/2011605, Section C.1.5 • 05000391/2011607, Section C.1.12 • 05000391/2011609, Section C.1.2 • 05000391/2012603, Section C.1.6 • 05000391/2012610, Section C.1.2* 	<ul style="list-style-type: none"> • ML110410680 • ML110800483 • ML112201418 • ML112730134 • ML11350A229 • ML12123A156 • ML13035A201
02.02.e Completed Work	<ul style="list-style-type: none"> • 05000391/2010605, Section C.1.13 • 05000391/2011605, Section C.1.5 • 05000391/2011607, Section C.1.12 • 05000391/2013603, Section C.1.8 	<ul style="list-style-type: none"> • ML110410680 • ML112201418 • ML112730134 • ML13134A239
02.02.f As-Built Verification	<ul style="list-style-type: none"> • 05000391/2014608, Section C.1.3 	<ul style="list-style-type: none"> • ML14322A182
02.02.g Construction Testing	<ul style="list-style-type: none"> • 05000391/2010602, Section C.1.6 • 05000391/2014603, Section P.1.1* 	<ul style="list-style-type: none"> • ML101230144 • ML14129A381

02.01.f Other Electrical Components (Penetrations, Motor Operated Valves (MOVs), Circuit Breakers, Control Switches, Solenoid Valves, Fuse Blocks)

IP Section	Inspection Reports	ADAMS Accession Number
02.02.a Receiving Inspections	<ul style="list-style-type: none"> • 05000391/2013603, Section C.1.2 	<ul style="list-style-type: none"> • ML13134A239
02.02.b Storage	<ul style="list-style-type: none"> • 05000391/2013603, Section C.1.2 	<ul style="list-style-type: none"> • ML13134A239
02.02.d In-Process Installation	<ul style="list-style-type: none"> • 05000391/2010605, Section C.1.13 • 05000391/2011607, Section C.1.12 	<ul style="list-style-type: none"> • ML110410680 • ML112730197
02.02.e Completed Work	<ul style="list-style-type: none"> • 05000391/2010605, Section C.1.13 • 05000391/2011607, 	<ul style="list-style-type: none"> • ML110410680 • ML112730197

	Sections C.1.12 and OA.1.5 <ul style="list-style-type: none"> • 05000391/2011608, Section OA.1.5 • 05000391/2012602, Section OA.1.30 	<ul style="list-style-type: none"> • ML11311A082 • ML12087A324
02.02.f As-Built Verification	Documented in this section	

* Direct samples were not credited to IP 51053 during these inspections, however attributes from IP 51053 were inspected.

Documents reviewed are listed in the Attachment.

b. Observations and Findings:

No findings were identified.

Below is a summary of each section of IP 51053:

- Section 02.01 – Complete
- Section 02.02 - Complete
- Section 02.03 – Complete. This section allows for additional inspections in the areas covered by Sections 02.01 and 02.02. It was determined that no additional inspections are needed.

c. Conclusion:

The inspectors determined that the work observations, procedures, and as-built equipment associated with electrical components met the applicable requirements. Based on the historical NRC inspections and the recent inspection efforts, a sufficient number of samples have been observed to close IP 51053.

C.1.7 Environmental Inspection-Periodic (Inspection Procedure 80210)

a. Inspection Scope

The inspectors performed a periodic inspection of the environmental activities associated with WBN Unit 2. The inspection consisted of walkdowns of various structures and areas, and documentation review. The inspectors discussed the requirements imposed by the National Pollution Discharge Elimination System (NPDES) permits on Unit 1 which cover the activities on Unit 2. The inspectors performed a documentation review of the Tennessee NPDES permits which were the inspection basis documents. The review encompassed the annual non-radiological environmental operation reports for the years 2013 and 2014, and various process and procedure documents that constituted the environmental program. The inspectors performed walkdowns of various site areas both inside and outside of the protected area. These walkdowns included the areas associated with fuel oil and chemical handling inside the protected area and areas associated with waste water treatment and holdup such as yard ponds.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

The detailed written directives and procedures adequately documented the environmental program requirements. The program had clearly identified roles and responsibilities. There was sufficient audit and assessment activity to establish that the supporting laboratories were appropriately responsive to the customers' needs. The QA plans provided appropriate surveillance of the environmental program, and an appropriate sensitivity to environmental requirements such as markings for waste oil, asbestos, and general waste containers. The applicant has decentralized some responsibilities and is actively seeking to increase the environmental awareness and training level of the site personnel.

c. Conclusion

The inspectors concluded that the environmental programs required for Unit 2 construction activities were properly implemented. There is no evidence of erosion, excessive runoff, or oil contamination in waste water.

P.1 Preoperational Activities

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

a. Inspection Scope

02.01 (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 safety-related systems or portions thereof:

- System 070 - Component Cooling System
- System 063 - Safety Injection System
- System 074 - Residual Heat Removal 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 applicant's procedures (further discussed in Section F.1.1);

- activities in progress (e.g., maintenance, preoperational testing, etc.) were being conducted in accordance with applicant procedures;
- listened for the public address system announcements to verify that blind spots do not exist; (i.e., cannot be heard clearly enough to be understood);
- construction work force authorized to perform activities on systems or equipment;
- watched for abuse of installed instrumentation such as stepping or climbing on the instrumentation that could affect the calibration or ability to function; and
- observed cable termination activities to verify that cables were not being damaged.

In addition, the inspectors observed the preoperational test of the motor-operated valve stroke time logic test 2-063-FCV-7. The inspections were completed to verify that the testing was conducted in accordance with the approved procedure 2-PTI-063-05-A, "Safety Injection System Pump/Valve Logic Test Train A," Rev. 2. Also, the inspectors observed two preoperational motorized valve dynamic tests for 2-FCV-074-33A and 2-FCV-074-12A to verify that the tests were completed in accordance with the approved work instructions in work orders (WOs) 114902989 and 114902947.

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) Preoperational Test Witnessing – Reactor Coolant System Cold Hydrostatic Test (Inspection Procedure 70462)

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 quality assurance 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 94300, Status of Plant 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 of a mandatory test. IIR 05000391/2014608 (ADAMS Accession No. ML14322A182) documented the previous effort for this IP and determined that it would remain open pending verification that post-hydrostatic nondestructive examination (NDE) results meet the applicable acceptance criteria.

Inspection Activities: After the hydrostatic test of the vessel, the inspectors observed the applicant's magnetic particle examination of steam generator (SG) 1 and SG 2 primary hemispherical head to tube sheet circumferential weld joints and two heat-affected zones of Weld Category A, as identified by American Society of Mechanical Engineers (ASME) Section III Subarticle NB-5400 as documented in IIR 05000391/2014608. Nonconformance reports were written for several linear indications on both SGs. Inspectors reviewed the nonconformance reports, reviewed the corrective actions, and observed the retesting to verify repairs were within design allowances and that the authorized nuclear inspector (ANI) verified test results were adequate.

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 was conducted in accordance with approved procedures and that the evaluation of test results was adequate and consistent with inspector observations. IP 70462 is considered closed.

P.1.3 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope:

The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-063-05A, Safety Injection System (SIS) Pump/Valve Logic Test-Train A, 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's logic tests were selected for inspection of this item:

- 2-FCV-63-7
- 2-FCV-63-158
- 2-FCV-63-21
- 2-FCV-63-87
- 2-FCV-63-90
- 2-FCV-63-127
- 2-FCV-63-77
- 2-FCV-63-115
- 2-FCV-63-130
- 2-FCV-63-24
- Safety Injection Pump A-A

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.

P.1.4 Preoperational Test Witnessing (Inspection Procedures 70312 and 70439B)

a. Inspection Scope

The inspectors witnessed the performance of preoperational test procedure 2-PTI-070-02A, Component Cooling System Unit 2 Train A 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 observed the following attributes associated with this test observation:

- 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
- 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
- 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 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.

b. Observations and Findings

No findings were identified.

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-070-02A.

P.1.5 Preoperational Test Procedure Review (Inspection Procedures 70300 and 70339)

a. Inspection Scope

The inspectors reviewed preoperational test procedure 2-PTI-070-02A, Component Cooling System Unit 2 Train A Flow Balance, prior to performance of the test, 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
- 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 and that test boundaries were established.

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-070-02A.

F.1 Fire Protection

F.1.1 Fire Protection (Inspection Procedure 64051)

a. Inspection Scope

The inspectors performed a walkdown of construction areas to determine whether construction activities and areas met procedure requirements for fire protection. The inspectors selected a limited set of field-verifiable attributes from fire operating requirement instructions and preventive maintenance guidance for field observation and evaluated 10 fire suppression devices.

The inspectors visually observed the physical condition of portable fire extinguishers in the Unit 2 construction areas to ensure they were free of obstructions and easily accessible, seals were not broken, and that there was no evidence of physical damage, corrosion, or other impairments. The inspectors reviewed preventive maintenance instructions to determine whether records of these 10 fire suppression devices met procedure inspection requirements.

The inspectors observed three construction activities using ignition sources to determine whether fire prevention procedure requirements were met. This included the handling and use of flammable materials and the use of combustible materials relative to locations of flammable ignition sources. Specifically, the inspectors observed fire watch activities related to:

- welding and grinding under WO 115802852, Modify Pipe Support 2-03A-504, U2 South Valve Room;
- welding and grinding under WO 113287719-R1, Rework Conduit 2VC4869 & 2VC3049A, U2 North Valve Room; and
- welding and grinding under WO 09-954326-004, Verify/Install Sense Lines, Supports for 2-SENL-003-0218A & 2-SENL-003-0282A, U2 Containment, El. 702', Az. 230.

The inspectors reviewed PER 949045 which documented a small acetylene bottle that caught fire in the Unit 2 south valve vault room. The inspectors inspected plant equipment and reviewed the PER to verify that corrective actions were adequate.

The inspectors reviewed PER 947725 which documented that duct tape ignited and was immediately extinguished in the Unit 2 reactor building. The inspectors inspected plant equipment and reviewed the PER to verify that corrective actions were adequate.

The following fire suppression devices were observed:

Portable Fire Extinguishers

- U2-27-A (U2 Containment Building, El. 713, Az. 45)
- U2-21 (U2 Containment Building, El. 713, Az. 45)
- U2-42 (U2 Containment Building, El. 722, Az. 75)
- U2-25 (U2 Containment Building, El. 722, Az. 75)
- U2-28 (U2 Containment Building, El. 709, Az. 337)
- U2-20-A (U2 Containment Building, El. 708, Az. 145)

- U2-26 (U2 Containment Building, El. 708, Az. 145)
- U2-18 (U2 Containment Building, El. 709, Az. 155)
- 1053 (Upper Head Injection Room, El. 729)
- U2-31 (U2 Containment Building, El. 757, Upper Containment)

The following samples were inspected:

- IP 64051 Section 02.07 – 10 samples
- IP 64051 Section 02.08 – 3 samples

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The applicant generally implemented adequate fire protection measures and controls to support Unit 2 construction activities and minimize impact on Unit 1 operational activities.

IV. OTHER ACTIVITIES

OA.1.1 (Discussed) Generic Letter 89-04: Guidance on Developing Acceptable In-Service Testing Programs; Temporary Instruction 2515/114: Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs; Temporary Instruction 2515/110: Performance of Safety-Related Check Valves

a. Inspection Scope

Background: Generic Letter (GL) 89-04 informed licensees of NUREG-1482, "Guidelines for Inservice Testing Programs at Nuclear Power Plants." NUREG-1482 contained recommendations for developing and implementing inservice testing programs. NUREG-1482 referenced 10 CFR 50.55a(b), which stated the requirements of the ASME Operation and Maintenance (OM) for Nuclear Power Plants was incorporated by reference into the NRC regulations. 10 CFR 50.55a(f)4 requires that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, pumps and valves which are classified as ASME Code Class 1, 2, and 3 must meet the inservice test requirements of ASME OM Code as incorporated by reference in 10 CFR 50.55a(b). As referenced in SSER 22 Section 3.9.6, TVA was expected to submit an inservice test (IST) program and the office of Nuclear Reactor Regulation (NRR) open specific relief requests for WBN Unit 2 nine months before the projected date of operating license issuance. TVA submitted a letter (ADAMS Accession No. ML14133A296), dated May 8, 2014, which provided the NRC staff with TVA's Technical Instruction (TI), 0-TI-100-006, "Inservice Testing Program" for the Watts Bar Nuclear Plant (WBN) Units 1 and 2, Rev. 1. For Unit 1 WBN submitted Enclosure 1, which was an update to the IST program for the Unit 1 third 10-year interval. Enclosure 2 of the submittal requested to allow (1) alignment of the 120 month interval dates for the Unit 1 IST program to be concurrent with Unit 2 IST program, and (2) Unit 1 and Unit 2 to utilize the latest edition and addenda of the ASME OM Code currently referenced by 10 CFR 50.55a(b), which is ASME OM Code 2004 Edition through 2006 Addenda.

The ASME OM code, subsection ISTD, requirements for dynamic restraints (snubbers), were not included in the applicant's IST program submittal. The dynamic restraints pre-service and inservice program requirements for TVA were submitted as part of the ASME Section XI program requirements instead of the IST program as permitted by 10 CFR 50.55a. The dynamic restraint testing inspections will be completed by the NRC in accordance with inspection procedure 70370, "Testing Piping Support and Restraint Systems."

Inspection Activities: To address Unit 2 actions the inspectors performed the following:

TI Paragraph	Inspection Scope
2515/110 03.01a	The inspectors reviewed the applicant's instructions 0-TI-100.006, "Inservice Testing Program for the Watts Bar Nuclear Plant (WBN) Units 1 and 2", Rev. 0, and 0-TI-100.100.013, "Check Valve Condition Monitoring Program," Rev. 0, to verify that the applicant had a program in place to ensure the operability of check valves in safety-related systems. The inspectors reviewed a sample of check valves across several safety-related systems to include auxiliary feedwater (AFW), component cooling system (CCS), safety injection system (SIS), emergency raw cooling water (ERCW), residual heat removal (RHR), and containment spray (CS) to verify the check valves were addressed in the applicant's check valve program.
2515/110 03.01b	The inspectors reviewed the scope of the check valve program as described in paragraph 03.01a above. In addition, the inspectors reviewed a sample of skid-mounted check valves as part of the diesel generator, diesel fuel, and auxiliary air systems to verify that the vendor supplied skid-mounted check valves were included in the program. The valves were included in the Unit 1 augmented inservice test program and were already in service.
2515/110 03.02a	The inspectors reviewed the applicant's IST program and check valve condition monitoring program. In addition, the inspectors reviewed a sample of check valves across several safety-related systems to include, AFW, CCS, SI, ERCW, RHR, and CS to verify the check valves in the sample were included in the testing program.
2515/110 03.02b	N/A. This requirement is not applicable to WBN Unit 2 due to the lack of operating maintenance history.
2515/110 03.02c	N/A. This requirement is not applicable to WBN Unit 2 due to the lack of operating inservice test data, technical specification, and operability requirements during construction.
2515/110 03.02d	N/A. This requirement to review vendor reports regarding notifications is not applicable to WBN Unit 2 because WBN Unit 2 is under construction; also the WBN Unit 2 program will mirror the Unit 1 program which has already been inspected and deemed adequate. In addition, the applicant's operating experience program is routinely inspected during reactor oversight process (ROP) baseline inspections such as problem identification and resolution (PI&R) and maintenance effectiveness.
2515/110 03.02j	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of check valve failure rate historical data.
2515/110	The inspectors reviewed the applicant's IST program and check valve

03.03	condition monitoring program to verify that test failures would be properly evaluated and that the Unit 2 trending would be similar to the trending program for Unit 1.
2515/110 03.04	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of check valve operability and reliability historical data.
2515/114 03.01	The inspectors selected a sample of pumps and valves across several safety-related systems to include AFW, CCS, SI, ERCW, RHR, and CS to verify the pumps and valves were addressed in the applicant's IST program. The inspectors reviewed the IST program procedures to verify that pumps and valves required to perform a specific function in shutting down the reactor to the safe shutdown condition, maintaining the safe shutdown condition, or mitigating the consequences of an accident, were included in TVA's IST program.
2515/114 03.02a	The inspectors reviewed the TVA IST program to verify that ASME Code Class 1, 2, and 3 pumps and valves with safety-related functions in the selected systems in 03.01 were included in TVA's IST program.
2515/114 03.02c	The inspectors reviewed the IST program relief request to verify that the requests met the requirements of 10 CFR 50.55a and the ASME OM code 2004, 2006 addenda.
2515/114 03.02e	The inspectors reviewed relief request bases and proposed alternate tests to verify the adequacy of the relief requests and to verify that the relief requests met the requirements of 10 CFR 50.55a and the ASME OM code 2004, 2006 addenda.
2515/114 03.02f	The inspectors reviewed the cold shutdown justification bases and refueling outage justification bases to verify the adequacy of the bases and that the bases met the requirements of 10 CFR 50.55a and the ASME OM code 2004, 2006 addenda.
2515/114 03.02i	The inspectors reviewed the TVA IST program controls and IST procedures to verify that the applicant had established procedures to re-verify or establish reference values after component maintenance or replacement. The inspectors verified that the Unit 2 controls were similar to the Unit 1 controls and those applicable processes and procedures were in place.
2515/114 03.02j	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) and does not have any post maintenance testing required activities. Post maintenance activities will be required for Unit 2, during operations, similar to Unit 1 as required by TVA procedure NPG-SPP-06.3, "Pre/Post-Maintenance Testing," Rev. 0001.
2515/114 03.04a	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of historical test data.
2515/114 03.04b	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of historical test data. Corrective actions for test results in the "Alert Range" or "Require Action Range" are not applicable to the construction component testing.
2515/114 03.04c	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of Technical Specification (TS) requirements and operability requirements for the plant while under construction.

2515/114 03.04d	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of historical tests data and actions taken on components indicating a degrading condition or a repetitive problem.
2515/114 03.04e	N/A. This requirement is not applicable to WBN Unit 2 (Unit 2 is under construction) due to a lack of historical tests data and requirements for evaluating engineering requirements for inoperable components.
2515/114 03.05c	N/A. Not applicable to PWR plants.
2515/114 03.05h	The inspectors reviewed the IST program and instructions 2-SI-0-902, "Unit 2 Inservice Testing of Safety and Relief Valves," Rev. 0000, and 2-SI-0-911, "Periodic Replacement of Thermal relief Valves," Rev. 0000, to verify safety and relief valves in the selected systems were incorporated into the IST program.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

Introduction: The inspectors identified an unresolved item (URI) associated with the adequacy of the TVA's IST program scope and test frequencies assigned to several safety-related valves.

Description: During the review of the WBN Unit 2 Inservice Testing Program, the safety injection cold leg accumulator isolation valves and nitrogen charging isolation valves (FCV-63-67, FCV-63-80, FCV-63-98, FCV-63-118, FCV-63-63, FCV-63-87, FCV-63-107, and FCV-63-127) were identified as passive in the TVA IST program. The valves were planned to only be position checked remotely every two years instead of stroked time tested, as required, if the valves were classified as active, in accordance with ASME OM Code 2004, 2006 Addenda. The program did not include a justification on basis for the classification.

During the review of the TVA IST program, the inspectors questioned whether TVA met the requirements of 10 CFR 50.55a which by reference requires TVA to implement the scope requirements of the ASME OM Code. The ASME OM code requires all active valves that are required to change actuator position to accomplish a specific function in shutting down the reactor to a safe shutdown condition, or maintain the safe shutdown condition, or mitigate the consequences of an accident be assessed for their operational readiness and stroke time tested. The ASME OM code defines passive valves as valves that maintain obturator position and are not required to change position to accomplish the required safety function. The ASME OM code also requires valves with remote position indicators to be tested and observed locally at least once every two years to verify that the valve operation is accurately indicated. TVA classified the accumulator isolation valves as passive and, therefore, the TVA IST program required only a position verification test every two years. TVA had not demonstrated that the valves would not be called on to change position to mitigate the consequences of an accident which would require the valves to be classified as active. The inspectors identified several emergency operating procedures which required the valves to be repositioned in order to prevent excessive quantities of nitrogen from being injected into the reactor coolant system (RCS) in a post-accident condition. The emergency response guidelines, provided by the vendor, documented that the injection of nitrogen could inhibit natural circulation or lead to RCS pressure control difficulties. In response

to the observations within this URI, the applicant issued PER 951911 to review the URI and make corrective actions if necessary.

Further review is needed to address the URI as defined by IMC 0612:

“An issue of concern about which more information is required to determine (a) if a performance deficiency exists, (b) if the performance deficiency is More-than-Minor, or (c) if the issue of concern constitutes a violation. Such a matter may require additional information from the licensee or cannot be resolved without additional guidance, or clarification/interpretation of the existing guidance.”

This unresolved item is identified as URI 05000391/2014614-01, Potential failure to comply with the 10CFR50.55a and properly implement the scope of the ASME OM code. The inspectors concluded further inspection will be required to review the TVA IST bases documentation for the accumulator isolation valve classifications.

c. Conclusion

The inspectors identified URI 05000391/2014614-01, Potential failure to comply with the 10CFR50.55a and properly implement the scope of the ASME OM code. The inspectors concluded further inspection will be required to review the TVA IST bases documentation for the accumulator isolation valve classifications. Additionally, TI's 2515/110 and 2515/114 could not be completed in their entirety due to remaining test observations. Additional inspection is required to complete the remaining sections of TI 2515/110 and TI 2515/114.

OA.1.2 (Discussed) Three Mile Island Action Item II.B.1: Reactor Coolant System Vent (Inspection Procedures 92717 and 35007)

a. Inspection Scope

Background: After the Three Mile Island (TMI) accident the NRC required licensees/applicants to install a reactor coolant vent system to relieve non-condensable gases that could accumulate in the reactor head area. The NRC approved the TVA approach to this requirement in a letter dated April 28, 1993. The NRC's Safety Evaluation Report (SER), NUREG-847, Supplement 23, dated July 2011, indicated that TVA's approach for Unit 2 (which was similar to Unit 1) was acceptable. In addition to installation of the system to the quality requirements, required actions included demonstrating acceptable vibration behavior during preoperational testing, system testing, and incorporation into emergency procedures. This item was previously discussed in Section OA.1.3 of IIR 05000391/2013605 (ADAMS Accession No. ML13220A640), which documented the review of documentation confirming valve requirements and review of Unit 2 procedures. IIR 05000391/2013605 concluded and recommended inspection of final installation and testing for the reactor coolant vent system.

Inspection Activities:

SER dated April 28, 1993 TMI II.B.1 Specific Action	Description	Inspection Results	Status
1	Demonstration of acceptable vibration behavior during pre-operational testing	No inspection of this item was performed during the inspection period. This item should be inspected at a later time.	Open
2	Inspection of the task analysis pertinent to the use of the reactor head vent system (RHVS) in the emergency operating procedures (EOPs)	The inspectors reviewed the results of the applicant's task analysis as the task analysis itself is not a maintained historical record. Inspectors reviewed the lesson plan, 3-OT-SYS068A, Reactor Coolant System and Job Performance Measure 3-OT-JPMR093, Establish RCS Bleed Paths per FR-H.1 and found them to be satisfactory.	Completed
3	Inspection of the control room design for the RHVS	The inspectors reviewed the location of controls and alarm annunciators for the RHVS on the Unit 2 main control board and found them equivalent to the installation on the Unit 1 main control board and appropriately labeled.	Completed
4	Satisfactory completion of vent system testing in accordance with Subsection ISTC of the O&M Code 2004 through 2006 addenda for Category B valves (previously noted as Subsection IWV of Section XI of the ASME Code for Category B valves).	No inspection of this item was performed during the inspection period. This item should be inspected at a later time.	Open
5	Review of the EQ electrical equipment pertaining to the RCS head vent system	The inspectors reviewed environmental qualification information release WBNEQ-13051, Rev. 0, to verify that the purchased valves had certificates of conformance indicating that they met the	Completed

		requirements of IEEE 323-1974. The inspectors also reviewed the associated EQ binders and Unit 2-specific environmental drawings to verify that the qualification testing was still bounded for Unit 2, per IEEE 323-1974.	
6	Inspection of EOPs that make use of the RHVS in accordance with IP 42001	<p>Inspectors reviewed those Unit 2 EOPs that made use of the RHVS for the following attributes in accordance with Inspection Procedure 42001 and EOPs:</p> <ul style="list-style-type: none"> • that entry and exit points are easily followed, and that transitions between and within the Normal Operating, Alarm and Abnormal Operating Procedures and EOPs were appropriate, well defined, and easy to follow; • that decision points in the procedures were easily discriminated and understood; • that human factors were adequately considered for the intended use of the procedures. 	Completed
7	Review of the correction of final safety analysis report (FSAR) section 5.5.6.2 as specified by Unit 1 Safety Evaluation SSER 12, enclosure letter	Inspectors reviewed the enclosure letter to SSER 12, Item 11, dated April 28, 1993. Inspectors also reviewed the licensee response to the letter, dated July 25, 1995, and the closure to Item 11 in SSER 16, Approved Conditions. The inspectors reviewed the current revision of FSAR Section 5.5.6.2 and determined further inspection is required.	Open

In addition to the above items related to Three Mile Island Item II.B.1, the inspectors completed the as-built walkdown of the RCS vent piping as discussed in Section OA.1.6 of this report.

Documents reviewed are listed in the Attachment.

a. Observations and Findings

No findings were identified.

b. Conclusions

The inspectors concluded that the RCS vent piping was installed in accordance with the approved design drawings. This item will remain open pending future testing (vibration and O&M testing as noted above) of the reactor coolant vent system and further review of the changes to the FSAR for the RHVS.

OA.1.3 (Discussed) Generic Letter 89-10: Safety-Related Motor Operated Valve Testing and Surveillance (Temporary Instruction 2515/109)

a. Inspection Scope

The inspectors observed dynamic MOV diagnostic tests for the following Generic Letter (GL) 89-10 MOVs:

- 2-FCV-63-025B, boron injection tank outlet isolation valve (train B); and
- 2-FCV-63-026A, boron injection tank outlet isolation valve (train A).

As part of the observation of these tests, the inspectors conducted reviews to verify the following:

- 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 work orders;
- testing was performed in accordance with 2-TI-85.007, Chemical and Volume Control System High Pressure Safety Injection MOV Dynamic Test, Rev. 3;
- 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 two MOVs listed above to determine if the test conditions were consistent with the design basis operating flow rate and differential pressure as described in the applicable MOV design calculation, system description, and the Final Safety Analysis Report.

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. The applicant identified discrepancies during testing and issued work orders to inspect and repair both valves. Based on this limited review and the remaining actions by the applicant, no additional conclusion is warranted for this inspection.

OA.1.4 (Discussed) Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22 (Temporary Instruction 2515/120)

a. Inspection Scope

Background: TI 2515/120 was previously inspected and discussed in IIR 05000391/2013609 (ADAMS Accession No. ML13353A599) and IIR 05000391/2010603 (ADAMS Accession No. ML102170465). Background details are discussed in those inspection reports.

The purpose of TI 2515/120 is to verify through inspection the adequacy of applicant programs, procedures, training, equipment and systems, and supporting documentation for implementing the station blackout (SBO) rule.

Inspection Activities: The following Sections of TI 2515/120 were completed:

Section 03.01.a: The inspectors reviewed the 125V direct current (DC) vital battery system analysis and the 120V alternating current (AC) vital inverter calculation to verify the following items:

- The battery is sized consistent with the criteria of IEEE Standard 485, to power the SBO loads for the required coping duration.
- The battery calculation includes the DC control power requirement for breaker operations needed for recovery from an SBO event.
- The required instrumentation and control remains during the period a station blackout exists.
- Adequate voltage is available to the inverter during worst case battery output voltage.
- Input current (DC) requirement for constant kW loads is based on appropriate terminal voltage and efficiency.
- Appropriate battery multiplication factors were used.

Section 03.01.c: The inspectors reviewed the battery drawings and SBO coping evaluation to verify the applicant identified the appropriate list of containment isolation valves (CIVs) required to function during a station blackout. The inspectors reviewed the list of valves in the SBO coping evaluation, Appendix H, Sheet 2, to verify operation and position indication of the listed CIVs is powered independent of the normal Class 1E power supply.

Section 03.01.e: The inspectors reviewed Appendix D of the SBO coping evaluation to verify the applicant listed the appropriate air-operated valves that are required to function during a station blackout. The inspectors reviewed engineering document construction release (EDCR) 60749, the AFW system description, and performed walkdowns to verify

that the AFW level control valves have backup local sources and can be operated independent of the preferred and normal Class 1E power source. The inspectors reviewed calculation EPMSMC110292 to verify backup air systems to air operated valves are adequate to perform their intended function.

Section 03.01.h: For the main steam system, the inspectors reviewed the system description, drawings, calculations, construction documents and performed walkdowns to verify that the plant was being constructed such that steam generator PORVs can be operated remotely or locally, independent of the normal Class 1E power supply.

Section 03.01.i: For the auxiliary feedwater system, the inspectors reviewed the system description, drawings, calculations, construction documents and performed walkdowns to verify that the plant was being constructed such that valves within the AFW system flow path can be operated independent of the normal Class 1E power supply.

Section 03.01.k: For the reactor coolant system, the inspectors reviewed the system description, drawings, calculations, construction documents and performed walkdowns to verify that the plant was being constructed such that valves within the reactor coolant system flow path from the refueling water storage tank can be operated independent of the normal Class 1E power supply. Also that the reactor coolant automatic depressurization system can be operated independent of the normal Class 1E power supply.

Section 03.02: The inspectors reviewed the SBO coping evaluation along with selected procedures and guidelines to verify the applicant has accounted for provisions that:

- Verify a quality assurance program for SBO equipment has been implemented consistent with Regulatory Guide 1.155, Appendix A;
- Promptly restore offsite power;
- Verify specific actions to prevent or limit significant inventory loss;
- Ensure that the reactor has properly tripped;
- Ensure that decay heat removal by AC independent means has begun; and
- Direct the restoration of onsite AC (diesel) power.

Section 03.04: The inspectors reviewed documentation for the modification to supply backup nitrogen to the auxiliary feedwater level control valves and steam generator PORVs to verify procurement and installation of equipment required to meet the SBO coping duration. Specifically, the inspectors reviewed documents, drawings, and performed plant walkdowns of the backup nitrogen stations to verify the following:

- The modification is being implemented using controlled drawings, documents, and procedures.
- The capacity of air, fluid, and electrical systems support the modification.
- The applicant is using the latest installation specifications.
- The equipment being installed meets the configuration specified.
- The equipment is being installed in the proper location.
- The equipment that has been installed is identified, orientated, and supported as specified.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

To date, the applicant's actions taken to meet the requirements of the SBO rule are acceptable. However, modifications related to the Unit 2 SBO requirements were in progress at the time of inspection and specific procedures for coping with an SBO event had not been issued for Unit 2. Additional inspection will be required to close TI 2515/120.

OA.1.5 (Discussed) 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 Nonconformance Report (NCR) WBN NEB 8321 in accordance with 10 CFR 50.55(e). The issue was documented as construction deficiency report (CDR) 390/83-50 for Unit 1 and CDR 391/83-48 for Unit 2. The CDRs were primarily related to the ventilation system (System 30) sensing line flow switches, which were not installed in accordance with mounting drawings. For Unit 1, CDR 390/83-50 was closed in NRC IR 50-390/84-53 and 50-391/84-42 (ADAMS Accession No. ML072570621). NRC IIR 5000391/2013604, Section OA.1.4 (ADAMS Accession No. ML13179A079) documented additional background details and inspection results for CDR 391/83-48.

Inspection Activities: The inspectors observed calibration activities for flow switch FS-30-80A/B as required by WO 112864870, "Perform GTI-01 on Flow Switch Calibration: WBN-2-FS-030-0080A/B-B and B/A-A, CTN 2-030-01346-101-000," 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 verified the as-built installation of the flow switch and found sensing lines properly located and oriented.

Documents reviewed are listed in the Attachment.

b. Observations and findings

No findings were identified.

c. Conclusion

Flow switch calibration activities were adequate and as-built installation matched final drawings and records. Additional field observations are required to verify that flow switch calibration and installation are being adequately performed.

OA.1.6 (Closed) Supplemental Safety Evaluation Report, Appendix HH Open Item 69, U2 RCS Vent System Acceptable Pending Verification that Reactor Coolant System Vent System is Installed (Inspection Procedures 92717 and 35007)

a. Inspection Scope

Background: This item is associated with Three Mile Island Item II.B.1: Reactor Coolant System Vent, also discussed in Section OA.1.2 of this report. After the TMI accident the NRC required licensees/applicants to install a reactor coolant vent system to relieve non-condensable gases that could accumulate in the reactor head area. The NRC approved the TVA approach to this requirement in a letter dated April 28, 1993. The NRC's Safety Evaluation Report (SER), NUREG-847, Supplement 23, dated July 2011, indicated that TVA's approach for Unit 2 (which was similar to Unit 1) was acceptable. This item was also previously discussed in Section OA.1.3 of IIR 05000391/2013605 (ADAMS Accession No. ML13220A640) which documented the review of documentation confirming valve requirements and review of Unit 2 procedures.

Inspection Activities: In addition to the above items related to Three Mile Island Item II.B.1, the inspectors completed the as-built walkdown of the RCS vent piping from the refueling disconnect flanges down to the flow orifice on top of the reactor vessel head. The inspectors interviewed QC personnel and reviewed the flange torque data sheets to verify that the piping was installed in accordance with the work instructions and the approved design drawings. The inspectors also witnessed the applicant and ANI inspection of the reactor head vent during the RCS hydrostatic testing of piping IAW with ASME Section III 1971 to 1973 Addenda, as discussed in Section P.1.3 of IIR 05000391/2013608 (ADAMS Accession No. ML13316A776).

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on a review of the applicant's engineering complete closure package and the aforementioned inspection activities, the inspectors concluded that the RCS vent piping was installed in accordance with the approved design drawings. Therefore, SSER Appendix HH Item 69 is considered closed.

OA.1.7 (Closed) Cable Issues Corrective Action Program – Sub-Issue: Supports in Vertical Trays and Construction Deficiency Report 50-391/89-04: Support of Class 1E Cables Installed in Long Vertical Cable Tray Runs (Temporary Instruction 2512/016 and Inspection Procedure 51063)

a. Inspection Scope

Background: The Cable Issues Corrective Action Program (CAP) – Sub-Issue: Supports in Vertical Trays and CDR 391/89-04: Support of Class 1E Cables Installed in Long Vertical Cable Tray Runs, are similar issues and have been inspected together. The concern that long vertical cable tray runs may not be adequately supported was initially

reported to the NRC on May 26, 1989, in accordance with 10 CFR 50.55(e) as a Condition Adverse to Quality Report (CAQR) WBP 880575. The follow-up final report associated with the notification (ADAMS Accession No. ML073551053) was transmitted by letter dated September 7, 1990, and identified the apparent cause, safety implications, and planned or completed corrective actions. TVA's plans were to use the same approach as used at WBN Unit 1 and using the requirements in General Construction Specification G-38, which meets current standards. TVA commitments in this regard (NCOs 890140002 and 890140007) were to:

- report on support of Class 1E cables installed in long vertical cable tray runs in Unit 2 before Unit 2 fuel loading; and
- complete calculations, walkdowns, evaluations, and rework for Unit 2, as required to address this issue, before Unit 2 fuel loading.

IIR 05000391/2013605 (ADAMS Accession No. ML13220A640) concluded in Section OA.1.2 that the programmatic aspects of the applicant's implementation plan for this CAP sub-issue were adequate. This is the same conclusion reached in Section OA.1.13 as reported in IIR 05000391/2010605 (ADAMS Accession Number ML110410680). Several inspections have been conducted to date, including observations of work associated with Kellem grips, as documented in IIR 05000391/2014605 (ADAMS Accession No. ML14226A049) and 05000391/2014608 (ADAMS Accession No. ML14322A182). The conclusions stated that additional fieldwork needed to be inspected.

Inspection Activities: The inspectors measured the radius of the cable bundles supported by Kellem grips for raceway 3B11911/3B1912 to verify that the correct size grip was installed. The inspectors also observed WO 114773157, which installed Kellem grips in the reactor building annulus, to verify that personnel were following the processes in accordance with procedure MIA 3.2, Cable Pulling for Insulated Cables Rated Up to 15,000 Volts, Rev. 27.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors concluded that the vertical supports which were sampled were adequately installed. Based on the field observations in this report, the prior field observations, and the reviews in IIR 05000391/2010605, 05000391/2014605, and 05000391/2014608, CDR 50-391/89-04 and Cable Issues Corrective Action Program – Sub-Issue: Supports in Vertical Trays are considered closed. With the closure of this sub-issue, all sub-issues associated with Cable Issues CAP are considered closed. The Cable Issues CAP is closed.

**OA.1.8 (Closed) Supplemental Safety Evaluation Report, Appendix HH, Open Item 38:
Availability and Operability of the Emergency Response Data System (Inspection
Procedure 92701)**

a. Inspection Scope

Background: Appendix HH open item 38 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 13.3.2.6 states that NRC staff will confirm the availability and operability of the emergency response data system (ERDS) data capabilities prior to the issuance of the Unit 2 operating license.

The scope of the present review is based on Section 13.3, Emergency Preparedness, of NUREG-0800, Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition (ADAMS Accession No. ML063410307). The SRP provides that, in general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor, those existing elements should be considered acceptable and adequate. This protocol applies to this inspection in that the WBN radiological emergency plan (REP) was written as a site-wide plan and that TVA proposed, and the Commission accepted, a regulatory framework in which TVA would align the Unit 1 and Unit 2 licensing and design basis to ensure design and operational fidelity between the two units.

Inspection Activities: The inspectors observed the applicant initiate ERDS data transmission and observed that available data was being received by an NRC Incident Response Center. Inspectors verified a sample of approximately 30 data points were received and that values were consistent with actual plant data read from the WBN Unit 2 plant computer system.

Documents reviewed are listed in the Attachment.

b. Observations and findings

No findings were identified. Appropriate Unit 2 ERDS data was available.

c. Conclusion

The inspectors observed transmission, receipt, and display of a sample of available plant data points. Based on the results of this inspection SSER Appendix HH, Open Item 38 is closed.

**OA.1.9 (Closed) Supplemental Safety Evaluation Report, Appendix HH, Open Item 40:
Confirm the Adequacy of the Emergency Facilities and Equipment to Support Dual
Unit Operations (Inspection Procedure 92701)**

a. Inspection Scope

Background: Appendix HH open item 40 is identified in NUREG-0847, Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2, SSER

No. 22. Section 13.3.2.8 states that the NRC staff will confirm the adequacy of the emergency facilities and equipment to support dual unit operations prior to the issuance of the Unit 2 operating license.

The scope of the present review is based on the Section 13.3, Emergency Preparedness, of NUREG-0800, SRP for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition. The SRP provides that, in general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate.

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

Inspection Activities: This inspection focused on ensuring the facilities were similarly equipped for events affecting either Unit 1, Unit 2, or both. The applicant had completed a self-assessment to verify processes and appropriate materials were in place in their emergency response facilities and identified remaining gaps. The inspectors reviewed the self-assessment, applicant procedures, and equipment inventories needed to support dual unit operations. The inspectors toured the technical support center (TSC), the operations support center (OSC), and the Central Emergency Control Center (CECC) with licensee/applicant personnel.

Documents reviewed are listed in the Attachment.

b. Observations and findings

No findings were identified. The inspectors observed that displays were able to display Unit 1 and Unit 2 plant data simultaneously. The inspectors reviewed revised quarterly facility inventory procedures and confirmed a sample of available procedures and drawings were in the TSC and OSC. The inspectors noted that document control processes should ensure additional items would be placed in the facility as they become available. Unit 2 technical specifications were not yet available and were not in the current facility quarterly inventory processes, however this gap was entered into the applicant's corrective action program with appropriate completion dates.

c. Conclusion

The inspectors determined that the facilities were adequate to support Unit 2 operations. Based on the results of this inspection SSER Appendix HH, Open Item 40 is closed.

OA.1.10 (Closed) Heat Sink Performance (Inspection Procedure 71111.07 Sections 02.02.d.2 and 02.02.d.4)

a. Inspection Scope:

Background: The subject IP required inspection of various activities associated with ensuring adequate heat sink for components. These items were identified as requiring

inspection at Watts Bar Unit 2. Section 02.02.d.2 of the IP covers inspection of underwater Ultimate Heat Sink (UHS) weirs or excavations, either by visual or other types of inspections. Section 02.02.d.4 of the IP covers applicant's operation of the ERCW System and the UHS.

Inspection Activities: The inspectors utilized the above IP to determine if sufficient activities had been performed to verify these inspection items were adequately addressed. For section 2.02.d.2, the inspectors checked for settlement or movement, indicating loss of structural integrity, and for sediment intrusion that may affect capacity. For section 2.02.d.4, the inspectors reviewed applicant procedures for a loss of the ERCW system or UHS; and verified that the instrumentation, which is relied upon for decision making, was available. In addition, the inspectors determined that macro fouling was adequately monitored, trended, and controlled by the applicant to prevent clogging. The inspectors also reviewed strong pump-weak pump interaction and design changes to the ERCW system and the UHS. The inspectors also performed a system walkdown of the ERCW system (pumps, travelling screens, etc), and intake structures. In addition, the inspectors reviewed corrective action documents related to the ERCW system and UHS issues, and operating experience to evaluate the effectiveness of the corrective actions.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified. The inspectors determined that the applicant had an appropriate threshold for identifying and correcting issues related to the ERCW system and the UHS.

c. Conclusion

Based on the activities reviewed, the inspectors concluded that these two inspection items from IP 71111.07 can be closed.

OA.1.11 (Closed) Construction Deficiency Report 50-391/94-04: Potential Freezing of Main Steam Pressure Transmitter Sense Line (Inspection Procedure 92701)

a. Inspection Scope

Background: Potential freezing of the sense line for the main steam system pressure transmitter (PT) 1-PT-1-009A was originally identified as a concern at Watts Bar following the occurrence of a transmitter freeze failure at Sequoyah Nuclear (SQN) Power Plant. This inspection item was previously reviewed in IIR 05000391/2012604 (ADAMS Accession No. ML12167A212) where it was concluded that movement of the pressure transmitter would resolve the issue.

Inspection Activities: The inspectors performed field walkdowns to verify that the subject PTs had been relocated to an area not subject to freezing conditions to resolve the original concern. Additionally, the inspectors reviewed the drawings to ensure that the PTs were installed as prescribed and that the installation locations of the sense lines were defined.

Documents reviewed are in the Attachment.

b. Observations and findings

No findings were identified.

c. Conclusion

Based on a review of the applicant's engineering complete closure package and the aforementioned inspection activities, the inspectors determined that the applicant has taken steps to adequately correct the discrepancies noted in CDR 94-04. This item is closed.

OA.1.12 (Closed) Three Mile Island Action Item II.B.2, Plant Shielding and Unresolved Item 05000391/2014604-01, Evaluate Methodology for Calculating Mission Doses (Inspection Procedure 92701)

a. Inspection Scope

Background: As part of the response to the Three Mile Island (TMI) accident, Section II.B.2 of NUREG-0737, Clarification of TMI Action Plan Requirements (ADAMS Accession No. ML051400209), required licensees and applicants to perform a radiation shielding design review of the spaces around systems that may, as the result of an accident, contain highly radioactive materials. The goal was to ensure that operator actions in vital areas necessary to mitigate the effects of an accident could be performed without exceeding the dose limits of 10 CFR 50 Appendix A, General Design Criteria (GDC) 19. To this end, plants performed "mission dose" calculations to verify that these dose limits could be met for specific post-accident tasks. Section II.B.2 also required plants to assess the Environmental Qualification (EQ) of safety-related components in the vicinity of post-accident high radiation fields.

During the initial inspection of TMI Action II.B.2, a URI was identified in IIR 05000391/2014604 (ADAMS Accession No. ML14177A214) (URI 05000391/2014604-01). That URI had two components:

- As part of calculation WBNAPS3124, "Dose to Personnel from Obtaining Post-LOCA Liquid Sample from Hot Sample Room, Rev. 3," the applicant calculated a mission dose of 74.99 rem to the extremity of a technician (the limit is 75 rem per NUREG-0737, II.B.3). However, the description of how extremity dose was handled for various mission starting locations didn't address the dose accrued due to the different travel times. Given that this mission dose had very little margin, the NRC required further clarification on the methodology used to evaluate extremity dose for this calculation.
- Calculations WBNAPS3124 and WBNAPS3125, "Post-LOCA RE-90-106, 112 Radiation Monitor Grab Sample Mission Dose, Rev. 2," contained an assumption that self-contained breathing apparatus (SCBA) or other types of respiratory protection would be necessary to mitigate airborne radioactivity. However, these calculations did not discuss the impact of SCBA use on technician efficiency. Instead, these two calculations relied on actual time-and-motion studies performed by a contractor. It was unknown whether these studies were

performed while wearing SCBA or other respiratory protection equipment. Therefore, the NRC required additional information regarding how these time-and-motion studies were performed and how they accounted for worker inefficiency due to the use of respiratory protection devices.

Inspection Activities: In order to address URI 05000391/2014604-01, the inspectors reviewed updated versions of WBNAPS3124 and WBNAPS3125 and discussed the revisions with applicant staff. The inspectors also evaluated additional mission dose calculations from a list of 14 essential, post-accident tasks. The calculations were reviewed to determine if appropriate mission steps had been evaluated, whether vital area locations had been adequately identified, and whether calculation methodology and assumptions were reasonable.

The inspectors also reviewed the applicant's activities regarding incorporation of mission dose assumptions (e.g. post-LOCA mission start times) into implementing-level procedures and the tracking of "unverified assumptions." This included discussions with applicant staff and a review of procedural guidance.

b. Observations and findings

No findings were identified.

The two components of URI 05000391/2014604-01 were resolved as follows:

- Mission dose calculation WBNAPS3124 was revised in order to demonstrate compliance with NUREG-0737 criteria for extremity dose. The revision consisted of a re-evaluation of the source term near the point of contact with the sampling equipment, which accounts for the majority of the extremity dose. This re-evaluation showed that the previous source term was overly conservative and could be lowered, thereby reducing the dose accrued during the sampling activities. This provided additional margin for the overall extremity dose assessment and showed that the required activities could be performed without exceeding NUREG-0737 limits for all analyzed starting locations.
- Calculations WBNAPS3124 and WBNAPS3125 were revised to include an SCBA inefficiency factor of 1.25. This increased the accrued dose for these activities, however this was offset by increasing the time post-LOCA that the missions were allowed to take place. In addition to this revision process, the applicant held discussions with the contractor who performed the time-and-motion studies for these calculations. These discussions confirmed that the studies were performed with individuals wearing SCBA. Therefore worker inefficiency is already accounted for in WBNAPS3124 and WBNAPS3125 and the additional factor of 1.25 is conservative, but not necessary.

As noted in IIR 05000391/2014604, the mission dose calculations contained certain assumptions regarding operator actions, timing of the missions post-accident, and pre-positioning of tools and equipment. Discussions with applicant staff and a review of mission dose documentation revealed that these assumptions have been identified as "calculation design outputs". Per procedural requirements, these items will be tracked until incorporation into appropriate implementing-level documents. The inspectors also noted that WBNAPS3125 contained an "unverified assumption" that required U2

radiation monitors RE-90-106 & 112 to be of similar design to U1 in terms of emergency sampling. This item is tracked separately by the applicant. In addition, discussions with the responsible start-up engineer indicated that the method of sampling for U2 RE-90-106 & 112 will be the same as U1 RE-90-106 & 112 (via portable sampling cart).

c. Conclusion

The inspectors determined that the applicant's efforts were sufficient to satisfy the intent of TMI Action II.B.2 and that URI 05000391/2014604-01 has been resolved. Based on a review of the applicant's final closure package and the aforementioned inspection activities, TMI Action Item II.B.2 and URI 05000391/2014604-01 are closed.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

An exit meeting was conducted on December 9, 2014, to present inspection results to Mr. Skaggs and other members of his 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. Booker, EP&C Environmental Principle Program Manger
D. Charlton, TVA - Regulatory Compliance
W. Crouch, TVA - Engineering
T. Detchemendy, Emergency Preparedness Manager
J. Dolan, TVA - Environmental Scientist
J. Fisher, TVA - Regulatory Compliance
J. Grant, TVA - ERCW Startup Engineer
G. Jordan, TVA - Pump and Valve Performance Monitoring
W. Lee, Corporate EP Manager
T. Lund, TVA - Mechanical Maintenance
B. Malone, Bartlett - Electrical Engineer
M. Marinac, TVA – Operations Engineer
J. O'Dell, TVA - Regulatory Compliance
R. Onis, TVA - Engineering
J. Parshall, Manager, EP Program Planning and Implementation
K. Peterman, TVA/Bechtel – Flow Balance Monitoring
M. Phillips, EP Specialist
A. Salatka, Supervisor - EP Systems
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 49063	Piping - Work Observation
IP 50053	Reactor Vessels and Internals-Work Observation
IP 51053	Electrical Components and Systems – Work Observation
IP 51063	Electric Cable - Work Observation
IP 52053	Instrument Components and Systems - Work Observation
IP 64051	Procedures - Fire Prevention/Protection
IP 70300	Preoperational Test Procedure Review
IP 70302	Preoperational Test Program Implementation
IP 70312	Preoperational Test Witnessing
IP 70339	Component Cooling Water System Test - Preoperational Test Procedure Review
IP 70439B	Component Cooling Water System Test - Preoperational Test Witnessing
IP 70462	Reactor Coolant System Hydrostatic Test - Test Witnessing
IP 71111.07	Heat Sink Performance
IP 71302	Preoperational Test Program Implementation Verification
IP 80210	Environmental Protection - Initial and Periodic Inspections
IP 92701	Follow-up
IP 92717	IE Bulletins for Information and IE Information Notice Follow-up
TI 2512/016	Inspection of Watts Bar Nuclear Plant Cable Issues Corrective Action Program Plan
TI 2515/109	Inspection Requirements for Generic Letter 89-10, Safety Related Motor Operated Valve Testing and Surveillance
TI 2515/110	Performance of Safety-Related Check Valves
TI 2515/114	Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs
TI 2515/120	Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000391/2014614-01	URI	Potential Failure to Comply with 10 CFR 50.55(a) and Properly Implement the Scope of the ASME OM Code (Section OA.1.1)
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Closed

51053	IP	Electrical Components and Systems – Work Observation (Section C.1.7)
Open Item 69	SSER Appendix HH	U2 RCS Vent System Acceptable Pending Verification that Reactor Coolant System Vent System is Installed (Section OA.1.6)
2512/016	TI	Cable Issues Corrective Action Program – Sub-Issue: Supports in Vertical Trays (Section OA.1.7)
391/89-04	CDR	Support of Class 1E Cables Installed in Long Vertical

		Cable Tray Runs Material (Section OA.1.7)
Open Item 38	SSER Appendix HH	Availability and Operability of the Emergency Response Data System (Section OA.1.8)
Open Item 40	SSER Appendix HH	Confirm the Adequacy of the Emergency Facilities and Equipment to Support Dual Unit Operations (Section OA.1.9)
71111.07 Section 02.02.d.2	IP	Heat Sink Performance (Section OA.1.10)
71111.07 Section 02.02.d.4	IP	Heat Sink Performance (Section OA.1.10)
391/94-04	CDR	Potential Freezing of Main Steam Pressure Transmitter Sense Line (Section OA.1.11)
II.B.2	TMI Action Item	Plant Shielding (Section OA.1.12)
05000391/2014604-01	URI	Evaluate Methodology for Calculating Mission Doses (Section OA.1.12)
<u>Discussed</u>		
89-04	GL	Guidance on Developing Acceptable In-Service Testing Programs (Section OA.1.1)
2515/110	TI	Performance of Safety-Related Check Valves (Section OA.1.1)
2515/114	TI	Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs (Section OA.1.1)
II.B.1	TMI Action Item	Reactor Coolant System Vent (Section OA.1.2)
89-10	GL	Safety Related Motor Operated Valve Testing and Surveillance (Section OA.1.3)
2515/109	TI	Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance Qualification (Section OA.1.3)
2515/120	TI	Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22 (Section OA.1.4)
391/83-48	CDR	Relocating Sensing Lines on Upper Containment Cooler (Section OA.1.5)

LIST OF DOCUMENTS REVIEWED

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1.2 As-built Cable Terminations

Drawings

DRA 54145-065, Rev.2
 DRA 54145-085, rev 0
 DRA 53293-001 rev 6
 DRA 53217-180, rev. 3
 DRA 53217-186, rev. 0
 DRA 53217-187, rev. 1
 DRA 54145-65, Rev. 1
 ICARDS 2PP650A
 FCR 64144 AA-04, Fabrication of BUSS Extensions to use for Termination of Cables

Work Orders

WO 115117524, Terminate/Splice Cables at MCC, Junction Box and Valve
 WO 114809323,
 WO 115225222, Terminate/Splice Cable 2PP650A at 2-BD-211-A/10A and 2-MTR-3-118-A
 WO 115339416, Terminate 2PP662B at 2-BD-211B/10-B and 2-MTR-3-128-B

C.1.3 Raceway Walkdowns

Drawings

45W889-3, Conduit and Grounding Cable tray node diagrams NV-1,-2,-3,-3A,-3B,-4,-4A,-4V-5
 Rev. 1
 48W970-2, Cable tray supports in Annulus, Rev. 11

Calculation

EDQ00299920080002, Unit 2 Class 1E V4 Cable Ampacity, Rev. 26

C.1.5 Piping – Work Observations

PERs

PER 763877, “Evaluate use of gravity drain flush method for CS/RHR headers per N3M-938”
 PER 823432, “Compile all the information on the CS/RHR ring header cleanliness”

Procedures

N3M-938, “Cleaning and cleanliness of fluids system components”
 ANSI N45.2.1, “Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants,” 1973.

C.1.6 Electrical Components and Systems – Work Observation

DRA

DRA 54852-143
 DRA 54852-142
 DRA 54852-140
 DRA 54852-139
 DRA 54851-176
 DRA 54851-018

Other

10056E11, Watts Bar units 1&2 Motor Op Gate Valve, Rev. 2
 115E010, Motor Op Gate Valve, Rev. 0
 2-47W465-211, Problem N3-68-05R 068 Pressurizer nozzles to Press. Relief tank to CVCS to N3-68-22R, Rev. 4

C.1.7 Environmental InspectionProcedures

0-PI-ENV-000-001.Y, Annual Renewal of Air Permits and Monthly Inspection of Emission Sources, Revision 0011
 0-PI-ENV-000-007.W, Weekly Inspection of Hazardous Waste, PCB Storage Areas, and Demolition Waste Landfill Activities, Revision 0010
 0-PI-ENV-000-019.Q, Quarterly Storm Water Sampling, Revision 0009
 0-PI-ENV-000-460.3, NPDES Monitoring, Revision 0019
 0-PI-ENV-000-014.W, Monthly Inspection of Erosion/Storm Water Pollution Control, Rev. 4
 0-PI-ENV-1.0, Air Permit Compliance, Rev. 9
 0-PI-ENV-3.1, NPDES Plant Effluents, Revision 0036
 0-PI-ENV-3.4, Biotoxicity Sampling, Revision 0009
 0-PI-ENV-3.7, Inspection of Yard Holding Pond Dam, Revision 0000
 0-PI-ENV-3.8, NPDES Passive Mix Zone Survey, Revision 0000
 0-PI-ENV-5.1, Environmental Shipping, Revision 0009
 0-PI-ENV-5.2, Inspection of Hazardous Waste, PCB, Special Waste, Universal Waste, and Used Oil Storage Areas, Revision 0005
 0-PI-ENV-14.1, Environmental Reports and Regulatory Submittals, Revision 0004
 0-PI-ENV-14.2, Identification and Interpretation of Intake Warning Indicators, Revision 0004
 0-PI-ENV-14.3, Monthly Inspection for Environmental Compliance, Revision 0005
 CHDP-2, Conduct of Chemistry, Rev. 0003
 ECM-3, National Pollutant Discharge Elimination System (NPDES) Program, Revision 0016
 ECM-3 Att.1, State of Tennessee NPDES Permit TN0020168 Modified February 2005
 ECM-4, Erosion/Storm Water Pollution Prevention Controls, Revision 0035
 ECM-5, Handling, Storage, and Disposal of Used Oil and Hazardous Waste, Revision 0021
 ECM-8, Integrated Pollution Prevention Plan (IPPP), REV. 0032
 ECM-13, National Pollutant Discharge Elimination System (NPDES) Permit Application and New Permit Implementation, Revision 0002
 EVDP-1, Conduct of Environmental Programs, Rev. 0000
 NPG-SPP-05.13, Environmental Review Process for NEPA Compliance, Rev. 0001
 R&TA SOP-5.7, Environmental Management System – Regulatory Compliance, Rev. 0001
 RWI-006, Environmental Compliance, Revision 0008
 TVA-SPP-05.10, Environmental Compliance Management System (ECMS), Rev. 0001

Records

Tennessee Department of Environmental and Conservation Environmental Field Office
 Compliance Evaluation Inspection for NPDES Permit TN0020168, 6/16/2014 TN0020168,
 Discharge Monitoring Report for September 2014, 10/16/2014
 Tennessee Valley Authority Environmental Information-Watts Bar Nuclear Plants Units 1 & 2 ,
 11/18/1976
 Assessment: WBN-CEM-S-13-009, Hazardous Waste Compliance Program, 8/26/-9/27/2013
 Environmental Unannounced Hazardous Waste Assessment –Watts Bar Nuclear Plant,
 6/10/2014

P.1.2 Preoperational Test Witnessing – Reactor Coolant System Cold Hydrostatic Test

SG2 Linear indications

PER 945346 – ASME Related, Post Hydro NDE Indications on SG2

MT-903781-010

NCR-903781-23

NCR-903781-25

NCR-903781-29

SG4 Linear Indications

PER 945349 – ASME Related, Post Hydro NDE Indications on SG4

MT-903781-008

NCR-903781-24

NCR-903781-26

P.1.4 Preoperational Test Witnessing

2-PTI-070-02A, “Component Cooling System Train A 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 1-47W859-4, 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

WO115447949

P.1.5 Preoperational Test Procedure Review

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-070-02A, Component Cooling System Train A 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 1-47W859-4, Mechanical Flow Diagram Component Cooling System

DCN 64013

F.1.1 Fire Protection

WBN 0-FPS-510-EXT/INSP, File 01, Rev. 1, PORTABLE FIRE EXTINGUISHER INSPECTION CONSTRUCTION AREAS PMUG 0780V

NGP-SPP-18.4.8, Control of Ignition Sources (Hot Work), Revision 0003

IV. OTHER ACTIVITIES

OA.1.1 Generic Letter (GL) 89-04: Guidance on Developing Acceptable In-Service Testing Programs; Temporary Instruction (TI) 2515/114: Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs; TI 2515/110: Performance of Safety-Related Check Valves

Procedures

0-TI-100.006, WBN Unit 0 Inservice Testing Program, Rev. 0001
 0-TI-100-.13, WBN Check Valve Condition Monitoring Program, Rev. 0000
 0-TI-100.008, Unit 2 Inservice and Augmented Inservice Testing and System Pressure Test Program Implementation Matrix, Rev. 0000
 2-SI-0-902, Unit 2 Inservice Testing of Safety and Relief Valves, Rev. 0000
 2-SI-0-911, Periodic Replacement of Thermal relief Valves, Rev. 0000
 NETP-116, Inservice Testing Program Requirements, Rev. 0001
 NETP-116.1, Inservice Testing Program Evaluations and Reference Values, Rev. 0001
 NETP-116.2, Inservice Testing Program Trending Requirements, Rev. 0001
 NETP-116.3, Inservice Testing Program Preconditioning Guidelines, Rev. 0001
 NETP-116.4, Inservice Testing of Pressure Relief Devices, Rev. 0000
 NETP-116.5, IST Program Check Valve Condition Monitoring Requirements, Rev. 0000
 ANSI N271/ANS-56.2, Containment Isolation Provisions for Fluid Systems, 1976/1977
 ANS-56.8, Containment System Leakage Testing Requirements, 1994
 10 CRF 50 Appendix J, 2014
 NUREG-0800, Standard Review Plan, paragraph 6.2.4, Containment Isolation System, section II.6.e, 2014
 Regulatory Guide 1.141 – Containment Isolation Provisions for Fluid Systems, 1978
 Watts Bar FSAR sections, 3.2.3 and 6.2.4, Codes/Standards and Containment Isolation Systems, Amendment 11
 Watts Bar SSER 12 section 6.2.4, October 1993
 Watts Bar Calculation WBNOSG4102 – Containment Isolations System – Determination of Compliance to Isolation Provisions of GDC 55, 56, 57 and SRP 6.2.4, Rev. 0
 2-SI-3-906-A, Check Valve Testing During Hot Standby-Auxiliary Feedwater System (Train A), Rev. 18
 2-SI-3-923-A, Auxiliary Feedwater Pump 1A-A Comprehensive Pump Test, Rev. 12
 0-MI-0.34, Non-Intrusive Check Valve Testing, Rev. 0
 TI-100.007, Augmented Inservice Testing Program, Rev. 28
 FR-C.2, Westinghouse Emergency Response Guideline for Response to Degraded Core Cooling, April 30, 2005
 E-1, Westinghouse Emergency Response Guideline for Loss of Reactor or Secondary Coolant, April 30, 2005

Drawings

2-47W803-2, Auxiliary Feedwater System, Rev.21
 2-47W803-3, Auxiliary Feedwater System, Rev. 18
 1-47W809-1, Chemical and Volume Control System,
 2-47W809-1, Chemical and Volume Control System, Rev. 28
 2-47W809-2, Chemical and Volume Control System, Rev. 14
 2-47W809-3, Chemical and Volume Control System, Rev. 7
 2-47W809-5, Chemical and Volume Control System, Rev. 8
 2-47W811-1, Safety Injection System, Rev. 34
 1-47W845-1, Essential Raw Cooling Water System, Rev. 66
 1-47W845-2, Essential Raw Cooling Water System, Rev. 89
 1-47W845-3, Essential Raw Cooling Water System, Rev. 33
 1-47W845-4, Essential Raw Cooling Water System, Rev. 32

1-47W845-5, Essential Raw Cooling Water System, rev. 49
 1-47W845-7, Essential Raw Cooling Water System, Rev. 22
 2-47W845-2, Essential Raw Cooling Water System, Rev. 7
 2-47W845-3, Essential Raw Cooling Water System, Rev. 16
 2-47W845-3A, Essential Raw Cooling Water System, Rev. 6
 2-47W845-7, Essential Raw Cooling Water System, Rev. 6
 1-47W859-1, Component Cooling System, Rev. 61
 2-47W859-1, Component Cooling System, Rev. 17
 2-47W859-3, Component Cooling System, Rev. 27
 2-47W859-4, Component Cooling System, Rev. 20
 2-47W812-1, Containment Spray, Rev. 25
 2-47W810-1 Residual Heat Removal System, Rev. 19

Calculations

WBN-2-14-079, PRA Evaluation Response, Rev. 0

OA.1.2 Three Mile Island Item II.B.1: Reactor Coolant System Vent

Work Order

WO 115346875, EDCR 54835, FCR 61259 AA-01, SYS 068 WBN-068-0001 ASME Section III

EQ Packages

WBNEQ-SOL-001 (valve 396 and 397)
 WBNEQ-SOL-009 (valve 395 and 394)
 2-47E235-42, Environmental Data Environment- Harsh Lower Compartment, Rev. 1

Procedures

2-FR-C.1, Inadequate Core Cooling
 2-FR-H1, Loss of Secondary Heat Sink
 2-FR-I.3, Voids in Reactor Vessel

Drawings

DRA 54835-101, revision 15
 DRA 54835-102, revision 0
 FSK-M-6374, revision 2

SSERs

SSER 12
 SSER 16

Letters

NRC to TVA dated April 28, 1993
 TVA to NRC dated July 25, 1995
 License amendment 78

OA.1.3 Generic Letter 89-10: Safety Related Motor Operated Valve Testing and Surveillance

Procedures/Programs

2-TI-85.007, Chemical and Volume Control System High Pressure Safety Injection MOV Dynamic Test, Rev. 3

Calculations

MDQ0020632008-0238, MOV Valve and Actuator Capability for 2-FCV-63-025B, Rev. 2
 MDQ0020632008-0239, MOV Valve and Actuator Capability for 2-FCV-63-026A, Rev. 2

Work Orders

114900465, Perform d/p test on 2-FCV-63-0025-B
 114900734, Perform d/p test on 2-FCV-63-0026-A
 116234324, Inspect/repair 2-FCV-63-0025-B
 116234380, Inspect/repair 2-FCV-63-0026-A

Miscellaneous

WBN2-62-4001, Chemical and Volume Control System Description, Rev. 2

OA.1.4 Temporary Instruction (TI) 2515/120, Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22

Calculations

EPMSMC110292, Backup Nitrogen Supply for Auxiliary Feedwater LCVs and Main Steam PORVs, Rev. 8
 EDQ00023620070003, 125V DC Vital Battery System Analysis, Rev. 28
 WBNEEBMSTI120016, 120 VAC Vital Inverter Loading, Rev. 157
 EPMMA041592, Station Blackout Coping Evaluation, Rev. 20

Other

EDCR-2 60749, Rev. A

Procedures

1-AOI-40, Station Blackout, Rev. 4
 AOI-35, Abnormal Operating Instruction for "Loss of Offsite Power", Rev. 39

System Descriptions

N3-1-4001, Main Steam System Description, Rev. 17
 N3-3B-4002, Auxiliary Feedwater System Description, Rev. 17
 WBN2-68-4001, Reactor Coolant System, Rev. 4

DCN

DCN 60976-A, Replace Existing Lighting with LEDs and load shed for 125V DC FLEX analysis

Drawings

2-47W803-2, Flow Diagram Auxiliary Feedwater, Rev. 19
 2-47W803-3, Flow Diagram Auxiliary Feedwater, Rev. 13
 2-47W813-1, Flow Diagram Reactor Coolant System, Rev. 29

Service Requests

SR 954282, Calculation EPMMA041592 Contains Extraneous Battery Load Shedding Information
 SR 954451, Calculation EPMMA041592 Legacy Statement

OA.1.5 Construction Deficiency Report 391/83-48: Relocating Sensing Lines on Upper Containment Cooler

Drawings

2-47W600-2009, Electrical Instruments Sensing Line Slope Configuration – Interface, Rev. 2
 DRA 53599-003, Rev. 5

DRA 53599-002, Rev. 3
DRA 53599-001, Rev. 4

Calculation

Calculation 30216, Qualification of Sensing Lines Rev. 3

Miscellaneous

WBN-VTD-D295-0040, Dwyer Series 1620 Single and Dual Pressure Switches

OA.1.6 SSER Appendix HH Item 69, U2 RCS Vent System Acceptable Pending Verification that Reactor Coolant System Vent System is Installed

Work Order

WO 115346875, EDCR 54835, FCR 61259 AA-01, SYS 068 WBN-068-0001 ASME Section III

EQ Packages

WBNEQ-SOL-001 (valve 396 and 397)
WBNEQ-SOL-009 (valve 395 and 394)
2-47E235-42, Environmental Data Environment- Harsh Lower Compartment, Rev. 1

Procedures

2-FR-C.1, Inadequate Core Cooling
2-FR-H1, Loss of Secondary Heat Sink
2-FR-I.3, Voids in Reactor Vessel

Drawings

DRA 54835-101, revision 15
DRA 54835-102, revision 0
FSK-M-6374, revision 2

SSERs

SSER 12
SSER 16

Letters

NRC to TVA dated April 28, 1993
TVA to NRC dated July 25, 1995
License amendment 78

OA.1.8 Supplemental Safety Evaluation Report, Appendix HH, Open Item 38: Availability and Operability of the Emergency Response Data System

Procedures and Reports

EPIP-12, Emergency Equipment and Supplies, Rev. 34
EPIP-13, Initial Dose Assessment for Radiological Emergencies, Rev. 19
EPDP-15, Emergency Response Data System (ERDS), Rev. 0
TVA Nuclear Power Radiological Emergency Plan, Generic, Revision 103
TVA Nuclear Power Radiological Emergency Plan, Appendix C, Watts Bar Nuclear Plant, Rev. 103

Records and Data

TVA Nuclear Power Group Focused Self-Assessment Report No. WBN-DSL-F-13-001, Unit 2 Startup Readiness, Rev. 1

TVA Nuclear Power Group Focused Self-Assessment Report No. WBN-DSL-F-14-001, Unit 2 Startup Readiness, Rev. 0

Corrective Action Documents

942714; Add WBN Unit 2 Technical Specifications to EPIP-12

OA.1.9 Supplemental Safety Evaluation Report, Appendix HH, Open Item 40: Confirm the Adequacy of the Emergency Facilities and Equipment to Support Dual Unit Operations

Procedures and Reports

EPIP-12, Emergency Equipment and Supplies, Rev. 34

EPIP-13, Initial Dose Assessment for Radiological Emergencies, Rev. 19

EPDP-15, Emergency Response Data System (ERDS), Rev. 0

TVA Nuclear Power Radiological Emergency Plan, Generic, Revision 103

TVA Nuclear Power Radiological Emergency Plan, Appendix C, Watts Bar Nuclear Plant, Rev. 103

Records and Data

TVA Nuclear Power Group Focused Self-Assessment Report No. WBN-DSL-F-13-001, Unit 2 Startup Readiness, Rev. 1

TVA Nuclear Power Group Focused Self-Assessment Report No. WBN-DSL-F-14-001, Unit 2 Startup Readiness, Rev. 0

Corrective Action Documents

942714; Add WBN Unit 2 Technical Specifications to EPIP-12

OA.1.10 Heat Sink Performance

Procedures

TI-100.001, Inservice Testing of Pumps, Rev. 19, Dated 3/5/2014

NPG-SPP-09.7.3, Raw Water Corrosion Program, Rev. 1, dated 3/14/2014

NETP-108, Heat Exchanger Testing and Maintenance Program, Rev. 5, dated 8/21/2013

CHTP-108, Technical Chemistry Standards, Rev. 7, dated 5/29/2014

EPFS-13, Calibration and Maintenance of River Temperature Monitors-Watts Bar Nuclear Plant, dated 9/15/2014

O-CM-4.10, Sodium Hypochlorite Injection for Control of Slams, Slime, and MIC, Rev. 0, dated 8/7/2014

O-CM-4.05, Non-Oxidizing Biocide Injection for Control of Asiatic Clams, Zebra Mussels, and MIC, Rev. 0, dated 6/4/2014

O-AOI-13, Loss of Essential Raw Cooling Water, Rev. U2, draft not dated

O-AOI-13, Loss of Essential Raw Cooling Water, Rev. 1, 11/26/2013

EDMG-2, Serious Event Migration, Rev. 4, dated 8/21/2013

MA-1, Recovery from Loss of Shutdown Power and Loss of ERCW, Rev. 12, dated 4/25/2014

O-TI-79.000, Program for Implementing NRC Generic Letter 89-13, Rev. 0, dated 8/28/2014

O-MI-0.026, Heat Exchanger Cleaning and Inspection, Rev. 5, dated 6/3/2014

O-MI-70.002, Component Cooling Heat Exchanger Maintenance and Testing, Rev. 0, dated 7/8/2014

2-TSD-70-1, Component Cooling System (CCS), Rev. 70, dated 8/5/2014

TI-67.007, ERCW A-Train System Flush – Refueling Outage, Rev. 6, dated 2/28/2014

TI-67.008 ERCW B-Train System Flush Refueling Outage, Rev. 5, dated 2/28/2014

TI-79.703 Component Cooling System Heat exchanger C Performance Test, Rev. 8, dated 1/17/2013

TI-79.701 Component Cooling System Heat exchanger A Performance Test, Rev. 8,
dated 1/17/2013
NPG-SPP-09.3, Plant Modifications and Engineering Change Control, Rev. 17, dated 4/4/2014
25402-3DP-G04G-00504, System Description, Rev. 3, dated 7/13/2011

Drawings

1-47W845-1, Flow Diagram – Essential Raw Cooling Water System, Rev. 69
1-47W845-2, Flow Diagram – Essential Raw Cooling Water System, Rev. 91
2-47W845-2, Flow Diagram – Essential Raw Cooling Water System, Rev. 7
37W206-I, Intake Pumping Station Piping & Equipment, Rev. 32
53328-003, Intake Pumping Station Barrier, Rev. 0
17W302-I, Essential Raw Cooling Water, Control Air & HPFP Piping, Rev. 17,

Calculations

EPMJN010890, Performance of CCS Heat Exchanger, Rev 17, dated 5/12/2014
WBNAPS2015, Fluid Transient Pipe Segment Loads Due to Opening and Closing of Flow
Control and Isolation Valves, Rev. 1, dated 10/29/2008
WBNAPS2009, WBN Fluid Transient Event Identification for Essential Raw Cooling Water
System (67), Rev. 7, dated 11/17/2010
MDQ00006720080341, Essential Raw Cooling Water (ERCW) System Pressure Drop
Calculation, Rev. 13, dated 8/1/4/2014
CDQ000020080081, Loss of Chickamauga Drain Dam Analysis, Rev. 1, dated 3/12/2014

Reports

DCN 61077, Revise SDD, FSAR, Design Criteria etc. to support testing the Unit 2 ERCW
System, Rev. A, dated 10/4/2013
DCN 60684, Install New Connections for Fukushima Modifications, Rev. A, dated 8/23/2013
DCN 60928, Replace the obsolete 0_PDT-067-0431-A with a suitable model, Rev. A, dated
5/13/2013
ERCW System 67 System Health Report, dated 2/1-5/31/2014
CCW System 70 System Health Report, dated 2/1-5/31/2014
Work order 112674238, TI-79.703 Component Cooling System Heat exchanger C Performance
Test, dated 9/10/2012
Work order 114471479, TI-79.701 Component Cooling System Heat exchanger A Performance
Test, dated 6/5/2014
MIC and MAC Fouling Trend: GE Betz (Vendor) Monthly Bio-Fouling Report, dated 5/7/12-
8/12/2014
ERCW-RCW Sessile Coupon Monitoring: GE Betz (Vendor) Monthly Sessile Coupon Monitoring
Report, dated 06/14/2011-09/02/2014
RCW: Raw Cooling Water In-Plant FAO (Free Available Oxidant) Monitoring Data, dated 05/08-
10/26/2014
ERCW: Essential Raw Cooling Water In-Plant FAO (Free Available Oxidant) Monitoring Data,
dated 05/08-10/26/2014
Chemistry Reports WBN2 Inspection for monitoring and treatment for WBN Raw Water Systems
(0-CM-4.02 Phosphate Zinc 10/15/2014; 0-CM-4.05 Clams Mussel, Biocide 10/27/2014; 0-
CM-4.10, Sodium Hypochlorite 10/28/2014
Work Order 115349135, Monitoring of Silt Accumulation in Intake Channel
Work Order 113111808, Monitoring of Silt Accumulation in Intake Pumping Water Channel
Work Order 10812082000, Visual Inspection of Intake Pumping Station Pump Bay Train A
Work Order 112800598, Visual Inspection of Intake Pumping Station Pump Bay Train B
Work Order 114559493, CCS HTX A Heat Exchanger Visual inspection, dated 3/30/2014
Work Order 114933553, CCS HTX B Heat Exchanger Visual inspection, dated 8/14/2014
Work Order 114559455, CCS HTX C Heat Exchanger Visual inspection, dated 4/8/2014
Work Order 114972567, Calibration Check of Temperature Element 2-LPT-067-0456

Work Order 115585676, Calibration Check of Temperature Element 1-LPT-067-0456
 Work Order 114156343, Calibration Check of Temperature Element 1-LPT-067-0455
 Work Order 113762194, Calibration Check of Temperature Element 2-LPT-067-0455
 Work Order 115965732, 2-TI-79.701 Component Cooling System Heat Exchanger B Performance Test
 Work Order 112678393, TI-67.007 ERCW A-Train System Flush Refueling Outage
 Work Order 112678405, TI-67.008 ERCW B-Train System Flush Refueling Outage
 Work Order 114693285, TI-67.003 Component Flow Debris/Foreign Materials Testing Utilizing Ultrasonics ERCW – (Train A)
 NCO880206009, Perform calculations and Install Check Valves to prevent Pump to pump interactions (Bulletin 1988-04), dated 10/17/2013
 Work Order 09816828000, Replace A-A ERCW Pump Assembly with New Pump Assembly
 Work Order 0981692600, Replace B-A ERCW Pump Assembly with New Pump Assembly
 Work Order 09816924, Replace C-A ERCW Pump Assembly with New Pump Assembly
 Work Order 111238674, Replace D-A ERCW Pump Assembly with New Pump Assembly
 Work Order 09816921, Replace E-B ERCW Pump Assembly with New Pump Assembly
 Work Order 09816827, Replace F-B ERCW Pump Assembly with New Pump Assembly
 Work Order 09816925, Replace G-B ERCW Pump Assembly with New Pump Assembly
 Work Order 111238666, Replace H-B ERCW Pump Assembly with New Pump Assembly

Corrective Actions Generated

SR 952174, Graph/Chart showing Temperature versus Blockage for the ERCW System
 SR 952178, Trend Performance of Component Cooling System Heat Exchangers
 SR 952181, Revise Summary of Results and Conclusions in Appendix C of the Calculation EPMJN010890

Corrective Actions

SR 799527, E-B ERCW Pump Seal Drain Funnel Overflowing (closed to Work Order 115226139)
 SR 698545/PER 699727, Replace 1 A ERCW Strainer Shaft
 PER 918896, ERCW Pumps Margin Management Issue
 PER 926217, Design Engineering to evaluate Flow Induced Vibration

Specifications

N3-70-4002, System Description for Component Cooling System, Rev. 15, dated 9/1/2005
 WBN-SDD-N3-67-4002, Essential Raw Water Cooling Water System, System 67, Rev. 28, dated 10/29/2014
 WBN-SDD-WBN2-67-4002, Essential Raw Cooling Water System, System 67, Rev. 3, dated 8/29/2013
 WB-DC-20-19, Intake Pumping Station Concrete Structure, Intake Channel, and Retaining Walls, Rev. 12, dated 9/2/2008
 WBNP-DS-3835-2612, Design Specification for CCS Heat Exchangers, Rev. 3, dated 09/23/1992
 WBNP-DS-1925-2260-R5, Design Specification for Essential Raw Water Cooling Pumps, Rev. 5, dated 7/11/2013
 WBNP-DS-1925-2260-R3, Design Specification for Essential Raw Water Cooling Pumps, Rev. 3, dated 7/26/1995
 WBN2-70-4002, Component Cooling System Design Data, Rev. 4, dated 04/25/2014
 WB-DC-40-29, Flood Protection Provisions, Rev. 12, dated 5/20/2014
 WB-DC-40-29, Flood Protection Provisions, Watts Bar Nuclear Plant, Unit 1/Unit 2, Rev. 13, in draft
 WBN-SDD-N3-3B-4002, Auxiliary Feedwater System, Rev. 17, dated 11/06/2014
 Chapter 3.01, System Chemistry Specifications, Rev. 94, dated 9/26/2014

Miscellaneous

BFN-NOER-12-102, Untimely Implementation of CAPRs to Address ERCW System Health (PER 617305)
 BFN-NOER-13-049, Trend in EECW Piping Through-Wall Leaks (PER 721623)
 BFN-NOER-13-065, NRC Green NCV-Failure to Promptly Identify and Correct EECW Strainers Degraded/Non-conforming Condition (PER 677627)
 SQN-NOER-13-004, ERCW Degraded/Non-conforming Conditions During External Flood (PER 655763)
 SQN-NOER-13-006, Ineffective ERCW Treatment Strategy – AFI (PER 610576)
 Sequoyah (SQN), Browns Ferry (BFN), and Watts Bar (WBN) Nuclear Plants – Response to Generic Letter GL 89-13, Service Water System Problems Affecting Safety-Related Equipment, dated 1/26/1990
 Watts Bar Nuclear Plant-review of Additional Information on Generic Letter 89-13 Regarding Service Water Systems (TAC NOS. M74082 and M74083), dated 6/13/1994
 Watts Bar Nuclear Plant (WBN) – Unit 2 – Generic Communications Issued Prior to 1995, dated 9/7/2007
 Watts Bar Nuclear Plant, Unit 2 – Status of Generic Communications for Review (TAC NO. MD8314), dated 5/28/2008

OA.1.11 Construction Deficiency Report 50-391/94-04: Potential Freezing of Main Steam Pressure Transmitter Sense Line

DRA 53684-010, Rev. 1
 DRA 53684-011, Rev. 1
 DRA 53684-012, Rev.1
 EDCR 53684-B
 Drawing 47W600-30, Rev.13

OA.1.12 Three Mile Island Action Item II.B.2, Plant Shielding and Unresolved Item 05000391/2014604-01, Evaluate Methodology for Calculating Mission DosesProcedure

NPG-SPP-09.3, Plant Modifications and Engineering Change Control, Rev. 17

PERs

PER 885263
 PER 884700
 PER 951428

Other

WBNAPS3124, Dose to Personnel from Obtaining Post-LOCA Liquid Sample from Hot Sample Room, Rev. 3, Rev. 4, and Rev. 5
 WBNAPS3125, Post-LOCA RE-90-106, 112 Radiation Monitor Grab Sample Mission Dose, Rev. 2 and Rev. 3
 WBNTSR082, Mission Dose for Control or Verification Functions in the MG Set Room and/or the 480 Volt Shutdown Board Rooms, Rev. 8
 WBNTSR081, Mission Dose for Control or Verification Functions in the Switchyard, Diesel Generator Building, and Turbine Building, Rev. 8
 WBNTSR083, Mission Dose for Survey of Main Steam Lines and/or Steam Generator Blow Down Lines, Rev. 7
 Open Items/Commitment Completion Form NCO820253022, IP&S 169, Nureg-0737, II.B.2, Plant Shielding

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary feedwater
ANI	Authorized Nuclear Inspector
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CAQR	Condition Adverse to Quality Report
CCS	Component Cooling System
CDR	Construction Deficiency Report
CECC	Central Emergency Control Center
CIV	Containment Isolation Valve
CFR	Code of Federal Regulations
CS	Containment Spray
DC	Direct Current
EDCR	Engineering Document Construction Release
EQ	Environmental Qualification
ERCW	Emergency Raw Cooling Water
ERDS	Emergency Response Data System
FSAR	Final Safety Analysis Report
GL	Generic Letter
IMC	Inspection Manual Chapter (NRC)
IP	Inspection Procedure (NRC)
IIR	Integrated Inspection Report
M&TE	Measuring and Test Equipment
MCC	Motor Control Center
MOV	Motor Operated Valve
NCR	Nonconformance Report
NDE	Nondestructive Examination
No.	Number
NPP	Nuclear Performance Plan
NRC	Nuclear Regulatory Commission
OSC	Operations Support Center
PER	Problem Evaluation Report
PORV	Power-Operated Relief Valve
PT	Pressure Transmitter
PTI	Pre-Operational Test Instruction
QA	Quality Assurance
QC	Quality Control
RCS	Reactor Coolant System
Rev.	Revision
RHR	Residual Heat Removal
SAR	Safety Analysis Report
SCBA	Self-Contained Breathing Apparatus
SER	Safety Evaluation Report
SG	Steam Generator
SIS	Safety Injection System
SSER	Supplemental Safety Evaluation Report
TI	Temporary Instruction (NRC)
TMI	Three Mile Island
TS	Technical Specifications
TSC	Technical Support Center

TVA	Tennessee Valley Authority
URI	Unresolved Item
WBN	Watts Bar Nuclear Plant
WO	Work Order