



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

August 7, 2012

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

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2012605**

Dear Mr. Skaggs:

On June 30, 2012, 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 July 19, 2012, with Mr. Hruby 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 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

TVA

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000391/2012605 w/Attachment

cc w/encl: (See next page)

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Letter to Michael D. Skaggs from Robert C. Haag dated August 7, 2012.

SUBJECT: WBN NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2012605

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2012605

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: 1260 Nuclear Plant Rd
Spring City TN 37381

Dates: May 20 – June 30, 2012

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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 six-week period of inspections in the areas of quality assurance, identification and resolution of construction problems, construction activities, and follow-up of other activities. The inspection program for Unit 2 construction activities is described in NRC Inspection Manual Chapter 2517. Information regarding the WBN Unit 2 Construction Project and NRC inspections can be found at <http://www.nrc.gov/info-finder/reactor/wb/watts-bar.html>.

Inspection Results

- The inspectors concluded that concerns pertaining to several open items, including Unresolved Items (URIs), Non-cited Violations (NCVs), NRC Bulletins (BL), Inspection Follow-up Items (IFIs), and Construction Deficiency Reports (CDRs) have been appropriately addressed for WBN Unit 2. These items are closed.
- Other areas inspected were adequate with no findings of significance identified. These areas included various electrical systems and components; mechanical systems and components; nuclear welding; Special Programs (SPs); nondestructive examination (NDE); NRC BLs; CDRs, and refurbishment.

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REPORT DETAILS

Summary of Plant Status

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

I. QUALITY ASSURANCE (QA) PROGRAM

Q.1 QA Oversight Activities

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

a. Inspection Scope

During this inspection period, the inspectors continued to review problem evaluation reports (PERs), as part of the applicant's corrective action program, to verify that issues being identified under the corrective action program were being properly identified, addressed, and resolved by the applicant. The inspectors reviewed actions associated with PER 491403 dealing with a crack in the ceiling inside the auxiliary building. The inspectors independently reviewed applicable codes and standards, inspected the crack, and reviewed the applicant's engineering evaluation. This PER was also discussed in Section OA 1.22 of NRC integrated inspection report (IIR) 05000391/2012604. The inspectors reviewed the engineering evaluation associated with PER 491403 which concluded that the crack is normal for typical reinforced concrete. The evaluation also determined the crack to be acceptable and not structurally significant. This evaluation included visual assessments and ground-penetrating radar scans of the concrete. The evaluation also considered accepted industry codes and standards for the evaluation of nuclear safety-related structures.

b. Observations and Findings

No findings of significance were identified. The inspectors reviewed deterministic data and confirmed that the crack was not significant enough to cause the applicant to re-work any part of the structure and that it met the applicant's acceptance criteria as well as industry codes and standards.

c. Conclusions

Generally, the issues identified in the PERs were properly identified, addressed, and resolved.

Q.1.2 Safety Conscious Work Environment (IP 35007)

a. Inspection Scope

The inspectors reviewed existing program requirements and recent safety-related concerns identified by the applicant's and contractor's employee concerns program (ECP). The inspectors also met with the ECP coordinator and reviewed monthly and quarterly reports. The inspectors reviewed records to verify that significant problems

were documented under the corrective action program and were being properly identified, addressed, and resolved by the applicant.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

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

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

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

a. Inspection Scope

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 to assess the adequacy of the applicant's efforts to identify those construction activities that could potentially impact the operating unit. This included the review of selected work activities which the applicant had screened as not affecting Unit 1 to verify the adequacy of that screening effort. Additionally, the inspectors independently assessed selected construction activities to verify that potential impacts on the operating unit had been identified and adequately characterized with appropriate management strategies planned for implementation. Furthermore, the inspectors performed independent walkdowns of 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 order (WO) 112763656 dealing with Appendix R modifications to the A-train 480VAC safety-related shutdown board
- WO 110811966, CCI Engineering Document Construction Release (EDCR) 53594 Sys 062 2-RTV-062-0445A ASME Sect III

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

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

C.1.2 Ultrasonic Testing Examination and Construction Refurbishment Process (IPs 57080 and 37002)

a. Inspection Scope

The inspectors observed ultrasonic testing examination (UT) on Steam Generator 2 barrel stub plate to determine whether the examination was conducted in accordance with procedures and American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code 1971 edition through 1973 summer addenda. Specifically, the inspectors observed UT of the proposed potential-loose-part (PLP) penetration to determine whether material thickness met the minimum design thickness and recordable indications met the code acceptance criteria. During the observation, the inspectors:

- Assessed whether all applicable paperwork was available in the field and reviewed WO 112716124 to determine if it clearly specified the UT procedure
- Examined the UT equipment to determine whether the equipment was calibrated
- Examined the area to be inspected to determine whether the area was clearly defined
- Reviewed examination results to determine whether indications were correctly evaluated and analyzed.
- Reviewed remaining installation activities on Steam Generator 2 to determine whether the timing of the examination was in accordance with ASME B&PV Code 1972 through 1973 addenda and the area of examination would not be adversely affected by other installation activities

The inspectors reviewed personnel qualifications to determine whether the UT inspector was qualified in accordance with procedures and ASME B&PV Code 1971 edition through 1973 addenda.

The inspectors reviewed Acuren UT procedures UT-2, Rev. 12A, UT-PCI, Revision (Rev.) 0, and PCI UT procedure GQP-9.9, Rev.8, to determine whether the procedures were in compliance with ASME B&PV Code 1972 edition through 1973 addenda. Specifically, the inspectors reviewed the type of apparatus, the operating parameters, extent of coverage and scanning technique, sizes and frequencies of search units, and beam angle as specified in the procedures. The inspectors observed calibration of the UT equipment to determine whether the calibration was performed in accordance with procedures and ASME B&PV Code 1971 through 1973 addenda. Additional documents reviewed are in the attachment.

The following samples were inspected:

- IP 57080 Section 02.01 – one sample
- IP 57080 Section 02.02 – one sample

b. Observations and Findings

No findings of significance were identified

c. Conclusions

The UT examination performed on Steam Generator 2 was conducted in accordance with procedures and ASME B&PV Code 1971 edition through 1973 addenda.

C.1.3 Radiographic Examination (IP 57090)

a. Inspection Scope

The inspectors reviewed radiographic film to determine whether the radiographic quality was in accordance with applicable procedure and ASME B&PV Code 1971 edition through 1973 addenda requirements. Specifically, the inspectors reviewed seven radiographic films for the following:

- Penetrameter type, size, and placement
- Penetrameter sensitivity
- Film density
- Film identification
- Film quality
- Weld coverage

The inspectors reviewed radiographic film for the following welds:

- 2-062B-D139-35 C0R0
- 2-062B-D139-55 C1R0
- 2-062B-D139-57 C1R0
- 2-062B-D139-68 C0R0
- 2-062B-D139-69 C0R0
- 2-062B-D139-70 C0R0
- 2-062B-D139-67 C0R0

The inspectors reviewed radiographic film interpretation equipment to determine whether the equipment was calibrated in accordance with procedures. Additional documents reviewed are in the attachment.

The following samples were inspected:

- IP 57090 02.03.a – seven samples
- IP 57090 02.03.c – one sample

b. Observations and Findings

No findings of significance were identified

c. Conclusions

The radiographic film reviewed met procedure and ASME B&PV Code 1971 edition through 1973 addenda quality requirements.

C.1.4 Liquid Penetrant Testing Examination and Construction Refurbishment Process (IPs 57060 and 37002)

a. Inspection Scope

The inspectors observed liquid penetrant testing (PT) to determine whether the examination was conducted in accordance with applicable procedure and ASME B&PV Code 1971 edition through 1973 addenda requirements. The inspectors observed PT on the following welds:

- 2-063A-T185-20A C0R0
- 2-063A-T185-20B C0R0
- 2-063A-T185-23 C0R0
- 2-063A-T185-24 C0R0
- 2-063A-T189-19A C0R0
- 2-063A-T190-21A C0R0

During the PT observation, the inspectors reviewed work to determine whether the following attributes satisfied procedural guidance and the ASME B&PV Code 1972 edition through 1973 addenda:

- Applicable instructions (WOs 110815488 and 110815492) were present,
- The PT equipment and materials were certified and on location,
- Test attributes were specified and followed,
- Proper evaluation of indications was performed, and
- Post-examination cleaning was completed

The inspectors observed PT on Steam Generator 3 hot leg nozzle ring to determine whether the examination was conducted in accordance with applicable procedure and ASME B&PV Code 1971 edition through 1973 addenda requirements. Additional documents reviewed are in the attachment.

The following samples were inspected:

- IP 57060 02.02 – six samples

b. Observations and Findings

No findings of significance were identified

c. Conclusions

The PT observed met procedure and ASME B&PV Code 1971 edition through 1973 addenda requirements.

C.1.5 Structural Steel and Supports Work Observation (IP 48053)

a. Inspection Scope

The inspectors observed the installation of structural steel supports to determine whether the supports were installed in accordance with procedure, specification, and drawing requirements. Specifically, the inspectors examined support tolerances, adequacy of clearances, and anchor bolt spacing. The inspectors reviewed documents in WO 113412525 and 110719929 to determine whether structural steel supports were installed in accordance with the directions in the WOs. Additional documents reviewed are in the attachment. The inspectors observed installation activities for the following supports:

- 2-ISLS-998-3620
- 2-ISLA-998-3616
- 2-CSPR-252-82
- 2-CSPR-252-167

b. Observations and Findings

No findings of significance were identified

c. Conclusions

The structural steel support observed met procedure, specification, and drawing requirements.

C.1.6 Instrument Components and Systems – Procedure Review (IP 52051)

a. Inspection Scope

Work Procedure Review

Translation of Commitments

The inspectors reviewed one Bechtel and two TVA procedures to verify that NRC requirements and Final Safety Analysis Report (FSAR) commitments were properly translated into procedures for adequate control and installation of instrument components and associated items. The following procedures were reviewed:

- MAI-4.4A Instrument Line Installation (TVA)
- MAI-4.4B Instrument and Instrument Panel Installation (TVA)
- 25402-000-GPP-0000-N3401 Instrument and Instrument Line Installation (Bechtel)

The inspectors reviewed TVA procedure, MAI 4.4B, and Bechtel procedure, 25402-000-GPP-0000-N3401, to verify that installation requirements were consistent with the requirements of ANSI N45.2.4-1972 (also designated as IEEE 336-1971). The inspectors reviewed installation requirements pertaining to the use of latest approved drawings, use of manufacturer's recommendations, preservation of internal cleanliness, maintenance of component qualification requirements, and installation specifications and procedures. ANSI N45.2.4-1972 was endorsed by Regulatory Guide 1.30, which is listed in the conformance table in section 7 of the applicant's FSAR. The inspectors verified that these procedures, as well as TVA Instrument Line Installation procedure MAI-4.4A, contained the instrument and instrument line installation requirements consistent with TVA specification N3E-934, Instrument and Instrument Line Installation.

Slope of Instrument Lines

The inspectors reviewed TVA procedure MAI-4.4A to verify that the slope requirements contained were consistent with the slope requirements of TVA specification N3E-934. Inspectors previously concluded that the slope criteria included in specification N3E-934 met applicable requirements, including those in the FSAR in Inspection Report 05000391/2012602 Section C.1.9.

Physical Separation and Independence

The inspectors reviewed Watts Bar Unit 2 FSAR, Regulatory Guide 1.75, "Criteria for Independence of Electrical Safety Systems," IEEE 279-1971, "Criteria for Safety Systems for Nuclear power Generating Stations," and IEEE 384-1992, "IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits," to assess if the physical

separation and independence criteria were translated into specifications for internal panel wiring. The inspectors observed that design criteria document, WB-DC-30-4, "Separation/Isolation," section 4.6 establishes installation criteria for the separation of wiring within panels and other enclosures. The inspectors interviewed responsible engineers and reviewed documents to evaluate if specifications were established to ensure physical separation and independence requirements of instrument components within panels.

Inspection Procedure Review

The inspectors reviewed MAI-4.4A, MAI-4.4B and the Bechtel procedure to verify that they contained acceptance criteria sufficient for inspection to determine whether components and their installation, maintenance, and protection conformed to TVA's instrument and instrument line specification, N3E-934. Additionally the inspectors reviewed the procedures to verify that inspection record templates included spaces for identifying the specific characteristics being inspected, inspector's determination of conformity, and identifying nonconformities.

The inspectors reviewed the TVA instrument procedure, MAI 4.4B, and the Bechtel procedure to verify that the instrument inspection requirements were consistent with ANSI N45.2.4-1972 for inspection requirements including; inspection of protective measures of installed equipment, installation was in accordance with specified requirements, equipment was not damaged during construction, installation complies with latest drawings, component was installed with correct orientation.

The following samples were inspected:

- IP 52051 Section 02.02.c – one samples
- IP 52051 Section 02.02.d – two samples

b. Observations and Findings

No findings of significance were identified. The inspectors observed that the TVA and Bechtel procedures were used to install instrument and instrument lines and perform quality inspections by QC inspectors.

c. Conclusions

The inspectors determined that the applicant's requirements and NRC regulations were properly translated into specifications for installation of instrument components and instrument lines. The inspectors concluded that the installation and inspection procedures contained the requirements of ANSI N45.2.4-1972 and applicable construction specifications. For the samples reviewed, the inspectors concluded that the applicant's requirements and NRC regulations were met.

C.1.7 Instrument Components and Systems – Work Observation (IP 52053)

a. Inspection Scope

In-Process Installation

The inspectors performed a walkdown of in-process work being completed by work orders 110815487 and 110815490. The in-process work for WO 110815487 specifically inspected were sensing lines associated with Isolation Valve 2-ISIV-063-0305B and Flow Transmitter 2-FT-63-151. The inspection of WO 110815490 was of the sensing lines associated with the Flow Transmitter 2-FT-63-170 and root valves 2-RTV-063-0342A. These instrument components are within the Safety Injection System and are variables that provide information to indicate the operation of individual safety systems and other plant systems. The inspectors performed the walkdown to verify that physical separation was maintained between instrument lines, the bending ratio of the lines and support placement were according to engineering design drawings within the work packages, interface points between instrument lines and instrument components had appropriate welding connections, and that installed components were adequately protected from damage by adjacent construction activities. The inspectors interviewed foremen and field engineers on installation methods used, quality or engineering inspection schedules for the in-process work, and slope requirements to verify the method used was consistent with requirements reflected within work packages and work procedures. The inspectors also verified whether appropriate instrument component unit identification (UNID)s were in the field, components were in proper location and orientation, and whether the in-process work orders installed or reworked sensing line tubing and supports from process connections to panel isolation valves in accordance with specification N3E-934.

Completed Installation

The inspectors reviewed completed work order 09-952506-004, which mounted 2-FT-3-163A, Steam Generator Auxiliary Feedwater Flow transmitter, to verify whether the latest drawings had been used in the package. The inspectors walked down the transmitter to verify whether the correct transmitter was installed in the appropriate location and whether it was mounted in accordance with its environmental qualification. The inspectors also walked down the transmitter to verify whether the transmitter had appropriate protections for openings and could be protected from adjacent work. Steam generator auxiliary feedwater flow is identified in the FSAR as a variable that provides information to the operator to initiate required manual safety actions.

The inspectors reviewed and walked down completed WO 09-953656-008, which mounted level transmitter 2-LT-3-110 to verify that the correct model transmitter was installed in the appropriate location. Transmitter 2-LT-3-110 feeds into the low-low steam generator water level reactor trip signal.

The inspectors performed a review and walkdown of completed WO 11110579, which was associated with Flow Element 2-FE-063-0075, and installed orifice flanges, root valves, as well as instrument tubing and supports. These instrument components are within the Safety Injection System and are variables that provide information to indicate the operation of individual safety systems and other plant systems. These variables inform the operator when mitigating the consequences of an accident. Inspectors observed that physical separation was maintained between instrument lines supporting separate trains, that the bending ratio of the lines and support placement were according to engineering design drawings within the work packages, verified QC sign offs were

applicable, and that interface points between instrument lines and instrument components had appropriate welding connections. The inspectors interviewed foremen and field engineers on slope requirements to verify that the method used was consistent with the requirements reflected within work packages and work procedures. The inspectors also verified whether appropriate instrument component unit identification (UNID)s were in the field, and components were in proper location and orientation in accordance with specification N3E-934.

The following samples were inspected:

- IP 52053 02.02.c - two samples
- IP 52053 02.02.d - two samples

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors concluded that the mounting of transmitter 2-FT-3-163A was adequate. The inspectors determined that in-process and completed work associated with the sensing lines was being performed in accordance with design specifications and requirements, and NRC regulatory requirements were met.

III. OPERATIONAL READINESS ACTIVITIES

F.1 Fire Protection

F.1.1 Fire Protection (IP 64051)

a. Inspection Scope

The inspectors observed fire operations staff performing emergency light battery charger checks for three Appendix R dedicated light packs. The inspectors reviewed the procedure and made observations in the area of radiological controls, beam direction management, and design drawing requirements. The inspectors observed fire watch activities in the Unit 2 reactor and auxiliary building. The inspectors observed and interviewed fire watch personnel involved in hot work activities, as well as roving and continuous fire watch personnel. The inspectors interviewed fire watch personnel to verify that they had adequate knowledge of their responsibilities, applicable procedures, and the location of the nearest functioning fire extinguisher and telephone. The inspectors then took a limited set of field-verifiable attributes from preventative maintenance (PM) guidance into the field and evaluated five deployed extinguishers and five stationary extinguishers. The inspectors reviewed the extinguishers' labeling, accessibility, serviceability, and overall material condition. The inspectors reviewed documentation for the most recent PM records of these seven extinguishers to ensure that mandatory periodicities were met. Additional documents reviewed are listed in the attachment.

The following emergency light battery charger checks were observed:

- 0-BAT-228-0416/07
- 0-BAT-228-0416/23

- 0-BAT-228-0416/24

The following extinguishers were observed:

- U2-FW-046
- U2-25
- U2-19-A
- U2-27-A
- U2- 21
- U2-FW-88
- U2-FW-109
- U2-FW-95
- U2-FW-114
- AB-27

The following three hot work or grinding activities were observed:

- WO 110811966, CCI EDCR 53594 Sys 062 2-RTV-062-0445A ASME Sect III
- WO 111239517, CCM EDCR 52523C Sys 068 WBN-2-HG-R-068-RB
- WO 111935445, CCC EDCR 52633 PER 143772 Sys 031 667 2-STRU-667-5001

The following samples were inspected:

- IP 64051 Section 02.07 – ten samples
- IP 64051 Section 02.08 – three sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

Applicant fire fighting staff is adequately maintaining equipment for the purposes of suppressing fires within the auxiliary building and reactor building. They are also maintaining emergency lighting in the control room to ensure emergency lighting is available when required. The applicant implemented adequate fire protection measures and controls to support Unit 2 construction activities and minimize impact on Unit 1 operation activities.

IV. OTHER ACTIVITIES

OA.1.1 (Discussed) NRC Bulletin (BL) 79-24, Frozen Lines (IP 92717)

a. Inspection Scope

Background: This issue resulted from an industry event involving freezing of a common High Pressure Coolant Injection recirculation line in early 1979. The applicant evaluated all lines for the need for freeze protection to address this NRC BL. Later, Construction Deficiency Report (CDR) 391/94-04 resulted from identification of an additional line subject to freezing (Main Steam pressure transmitters) after the implementation of the corrective actions for the BL. The applicant's review for the BL identified two areas in

addition to originally designed freeze protection where additional freeze protection was warranted. These were sensing lines off the feedwater flow elements and a full flow test line from the containment spray pumps where it joins the refueling water storage tank. The applicant initiated EDCR 57933 for scoping for most of the susceptible instruments and piping including the feedwater lines. For the containment spray line, the applicant initiated FCR 59253.

Inspection Activities: EDCR 57933 was previously reviewed for inspection of CDR 391/94-04 (see NRC IIR 05000391/2012604, Section OA.1.2). During this inspection the inspectors reviewed documentation contained in the applicant's engineering complete package which included the historic NRC documentation, previous applicant commitments, and FCR 59253. The applicant has contracted with the Thermon company to provide specific freeze protection design for each configuration and installation of the equipment. This work had not yet begun.

b. Observations and Findings

No findings of significance were identified. The applicant has adequately scoped which equipment needs to be protected from freezing, however, actions are not yet implemented.

c. Conclusion

The applicant's planned actions to correct this problem are adequate. This item remains open pending review of final design and installation of freeze protection equipment.

OA.1.2(Discussed) CDR 391/83-07, Transfer Valves to Auxiliary Feedwater (AFW) Have Non-Divisional Power (IP 51063, 51065, 52053 and 52055)

a. Inspection Scope:

Background: During a design review of the AFW system, it was discovered that pressure switches for the suction of the turbine driven AFW pump received non-divisional power, whereas the WBN FSAR section 10-4-9-1 states that backup to the condensate storage tank is from the fully qualified seismic category 1 essential raw cooling water system (ERCW) and that the controls associated with the fully qualified ERCW transfer valves meet the requirements of IEEE-279.

Pressure switches sense suction pressure to the turbine-driven AFW pump and sends control signals to automatically open valves to admit ERCW if low pressure is sensed. This assures a continuous supply of steam generator make-up and prevents cavitation damage to the turbine-driven AFW pump if the normal makeup, from the nonqualified condensate storage tank, should be lost.

Inspection Activities: The inspectors reviewed the applicant's actions to resolve the deficiency by reviewing the engineering complete closure package, which included EDCR 54145. The inspectors reviewed the revised drawings to verify that the deficiency no longer exists and that the logic of operation is consistent with the description in the associated design documents. The inspectors also reviewed Unit 1 drawings associated with the same design change to verify that the same design that was used on Unit 1 was made to Unit 2. Additional documents reviewed are included in the attachment.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

Additional inspection activities are still required prior to closure of CDR 391/83-07; specifically, the inspectors will review TVA's field implementation.

OA.1.3(Discussed) CDR 391/80-06, AFW Design Deficiency (IP 51063, and 51065)

a. Inspection Scope:

Background: During a design review of the Class 1E power channels, it was discovered that the turbine-driven AFW pumps at WBN Units 1 and 2 do not receive instrument control power from an electric channel that is distinct from the channels serving the electric pumps as stated in the FSAR. As a result, a single failure could cause loss of the AFW system when needed following certain events. A major feedwater line rupture, on either Steam Generator 3 or 4, concurrent with loss of Channel 1-I Vital Instrument Power for WBN Unit 1, Channel 2-III vital Instrument Power for WBN Unit 2, could prevent the AFW systems from operating as required. The major line rupture could disable train B electric pump, and the loss of the noted vital instrument power would disable both train A electric pump and the turbine-driven pump of the AFW system.

Inspection Activities: The inspectors reviewed the applicant's actions to resolve the deficiency by reviewing the engineering complete closure package, which included EDCR 52343. The inspectors reviewed the revised drawings to verify that the deficiency no longer exists and that the logic of operation is consistent with the description in the associated design documents. The inspectors also reviewed the battery calculation to verify that the new power supplies were accounted for in the battery loading and voltage drop calculations. Additional documents reviewed are included in the attachment.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

Additional inspection activities are still required prior to closure of CDR 391/80-06; specifically, the inspectors will review portions of TVA's field implementation of EDCR 52343.

OA.1.4(Discussed) CDR 391/86-21: Non-Quality Assurance Data Used in Calculations for Cable Tray and Conduit Loading (IP 35007)

a. Inspection Scope

Background: In December 1987, TVA determined that undocumented sources had been used to obtain values for the cable weights and dimensions that had been entered into calculations for cable tray loads and cross-sectional area fill. As a result, the input values for the calculations could not be verified as required. TVA's evaluation of the deficiency identified instances where design criteria for cable fill were violated, including cases where additional cables had been routed on full cable trays resulting in

unevaluated overfilled conditions. In addition, NRC Notice of Violation (NOV) 390/87-11-02 identified a failure to assure that cable loading calculations considered all of the spare cables residing in raceways.

Inspection Activities: In this inspection, interviews were conducted with electrical design personnel and commitment closure documents were reviewed to evaluate the scope and status of actions planned to address this area of concern. The inspectors reviewed the applicant's verification of the accuracy of Unit 2 cable and raceway data based upon field inspections of Appendix R and environmentally qualified cables that had not been replaced or modified by the construction completion project. The inspectors reviewed walkdowns of cables installed in the plant to document as-installed unit identification numbers, mark numbers, sizes, and details of routing, including as-installed cable lengths. The inspectors reviewed calculation EDQ00299920090014, which compared the walkdown results to the values entered into the integrated cable and raceway design system (ICRDS) and updated the information system as required. Limited Scope Walkdown Document (LSWD) 542 was issued to reconcile conflicting data for 28 cables installed in the plant, although not yet implemented.

The inspectors reviewed calculations of cable ampacity to apply derating factors where needed for as-installed cable configurations. Cables requiring replacement were identified in DCN 53334. To address concerns about overloading conduits and cable trays, the inspectors reviewed revised design criteria document WB-DC-20-21.1, "Category I Cable Tray Supports," which included a complete design basis for cable trays and cable tray supports. Interviews with electrical design personnel identified that spare cables and cables abandoned in place were now specifically identified in the ICRDS data system in order to accurately analyze loads. EDCRs 52934, 55045, and 55231 were issued to implement necessary modifications to supports.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that actions to address historical concerns about the accuracy of data used in electrical calculations were still in process. Further inspection is required to verify completion of committed work.

OA.1.5(Discussed) CDR 391/95-05: Loose Connections in Vendor-Wired Electrical Panels (IP 35007)

a. Inspection Scope

Background: A December 1984 Nonconforming Condition Report (NCR W-205-P) identified deficiencies with electrical connections in vendor-wired safety-related panels. A 1993 QA audit subsequently identified that the nonconforming condition had not been adequately evaluated and the deficiencies had not been adequately dispositioned for the uninspected panels. There was an action initiated to walkdown all uninspected panels required for Unit 1 operation, and to evaluate any deficiencies that could create substantial safety hazards if left uncorrected. The action identified four categories of deficiencies: terminal blocks, loose connection, cable/conductors, and cable/conductor insulation gaps. The loose connection category was determined to have an adverse impact on plant safety because the resulting condition could affect the capability to mitigate consequences of design basis events or safely shut down the reactor, and

maintain it in a safe shutdown condition. Assurance could not be provided that identified loose connections would maintain circuit continuity during a seismic event. NRC violation 390/93-24-01 documented the failure to conduct inspections of other vendor-wired panels. Later, inspection report (IR) 50-390/95-72 and 50-391/95-72 verified closure of the issue for Unit 1 after panels were inspected and found discrepancies were corrected. The final corrective actions were documented in CDR 50-390, 391/95-05. Resolution of Unit 2 vendor-wired safety related panels/racks was required to be completed prior to Unit 2 fuel load. The Unit 2 corrective actions evolved into PER 145184, which included a list all the vendor-wired safety related panels/racks. Some Unit 2 boards required for Unit 1 were inspected in previous Unit 1 actions; however, not all Unit 2 vendor-wired safety-related panels were inspected for loose connections.

Inspection Activities: The inspectors interviewed responsible engineering personnel about the status of the outstanding actions on Unit 2. The inspectors also reviewed records within the closing package for loose connections, NCO950092001, as well as PER 145184. The inspectors determined that there are several work orders that are being developed to inspect and ensure that all Unit 2 vendor-wired safety related panels do not have loose connections. The inspectors reviewed the status of work orders that have been developed to perform inspection of all Unit 2 vendor-wired safety related panels and racks, including all work packages developed as a result of PER 145184.

b. Observations and findings

No findings of significance were identified. The review of engineering and corrective actions resulted in the verification of WOs associated with PER 145184. The status of the WOs was verified as being in the planning stage, therefore, no in-process or completed work activities were ready for inspection.

c. Conclusion

The inspectors determined that the corrective actions are still in process for this item. Further inspection is required

OA.1.6(Discussed) Three Mile Island (TMI) Action Item II.D.3 and SSER App. HH Item 74: Acoustic Detectors for Power Operated Relief Valve (PORV) Position Indication (IP 35007)

a. Inspection Scope

Background: The inspectors reviewed Unit 2 construction design activities for the overall compliance and progress of TMI action item from NUREG-0737, II.D.3: "Acoustic Monitoring Valve position indication on PORVs." This TMI action requires reactor coolant system relief and safety valves be provided with a positive indication of valve position in the control room, derived from a reliable valve-position detection device or a reliable indication of flow in the discharge pipe. Implementation is required to be completed prior to fuel-load. The inspectors had previously verified in IIR 05000391/2010605, Section OA.1.5, that the TMI actions, including NRC requirements and SAR commitments, were correctly translated into design drawings, design change packages, and that procedures for Unit 2 assured that designs were adequately controlled. Procurement documentation for Acoustic Monitors and electrical components (Material Requisition #: 25402-011-MRA-HAYS-0002 and PO#: 127959) was reviewed for adherence to manufacturer's storage specifications and licensee procedural requirements. Samples of instrument and electrical components were inspected for proper storage in the warehouse in IIR 05000391/2010605, Section OA.1.5.

Inspector Activities: The inspectors gathered information on WOs that were associated with EDCR 53760, Work scope #3: Acoustic Position Monitoring for RCS PORVs.

b. Observations and findings

No findings of significance were identified. The EDCR identified UNIDs related to the Acoustic Monitoring system components. These UNIDs were traced to WOs that were to perform the installation of the system components. The status of each associated WO was verified. Inspectors determined that the WOs were either in planning status, or approved for work, and no work activities had taken place for inspectors to verify implementation.

c. Conclusion

The inspectors verified the status of WOs related to TMI Action II.D.3, and found that they were in planning or approved for work. Therefore, inspectors determined that further inspection of samples would be required in order to verify adequate installation.

OA.1.7 (Discussed) CDR 391/79-22-07: Electrical Junction Boxes in Containment (Temporary Instruction (TI) 2512/036)

a. Inspection Scope

Background: The applicant reported to the NRC a concern, with the adequacy of junction boxes inside containment to withstand pressure that could occur from a LOCA or a Main Steam-line Break (MSB), in accordance with 10 CFR 50.55(e) as NCR EEB 79-8.

The applicant determined that the field-installed conduits connected to intermediate junction boxes do not have provisions for sealing around the conduit to box interface. In order to prevent moisture incursion within the conduit, a Room Temperature Vulcanizing (RTV) sealant was used around the cables within the conduits where they enter the junction box or within nearby condulets. Although this design restricted moisture intrusion within the conduit during normal operation, it was not sufficient during LOCA or MSB conditions. Safety-related circuits could have been damaged if enough moisture or steam entered the junction box during a LOCA or MSB and the safe shutdown of the plant could have been adversely affected.

Inspection Activities: The inspectors reviewed the applicant's open item engineering complete closure package, including referenced documents and actions associated with PER 172639, which was issued to track Unit 2 actions associated with CDR 391/79-22-07. During the review, the inspectors evaluated whether existing Class 1E terminations in junction boxes inside containment were properly identified. The inspectors interviewed responsible personnel to verify the adequacy of corrective actions to replace existing Class 1E splices located inside containment with Environmental Qualification (EQ) splices. In addition, where splices would not be replaced, the inspectors confirmed that Class 1E circuits would be terminated on EQ terminal blocks, and that additional considerations were addressed because of the use of EQ terminal blocks including: mounting location of the terminal blocks, terminal lugs used, and the presence of weep holes in the junction boxes.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that Class 1E terminations were properly identified and the proposed corrective actions were adequate. Additional inspection activities are needed to verify field installation of the Class 1E EQ splices and terminal blocks in order to close this CDR.

OA.1.8 (Discussed) CDR 391/85-30: Incorrect Equipment Cable Terminations in Harsh Environments (TI 2512/036)

a. Inspection Scope

Background: The applicant reported to the NRC, in accordance with 10 CFR 50.55(e) as NCR WBN 6224 and 6208, a condition in which some Class 1E equipment cable terminations in harsh environments or below the computed maximum flood level were not installed correctly. The identified cables were not terminated using EQ splices or approved end caps such that heat, moisture, and radiation could deteriorate cable insulation that could possibly cause short circuits and adversely affect the safe shutdown of the plant.

Inspection Activities: The inspectors reviewed the applicant's open item engineering complete closure package, including referenced documents and actions associated with PER 143534, which was issued to track Unit 2 actions associated with CDR 391/85-30. During the review, the inspectors evaluated whether existing Class 1E terminations located in areas designated as a harsh environment were properly identified. The inspectors interviewed responsible personnel to verify the adequacy of corrective actions to replace existing Class 1E splices located in designated harsh environments with EQ splices.

The inspectors reviewed WOs 112734401, 110966863, 110966674 to ensure prescribed work included the replacement of non-EQ splices with EQ splices and to verify the specification of approved EQ splice kits.

b. Observations and Findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that Class 1E terminations were properly identified and proposed corrective actions were adequate. Additional inspection activities are needed to verify field installation of the Class 1E EQ splices and end caps in order to close this CDR.

OA.1.9 (Closed) Inspector Follow-up Item (IFI) 05000391/93-20-02: Wedge Bolt Installation Practices (IP 35007)

a. Inspection Scope

Background: During an NRC inspection at Watts Bar Nuclear Plant conducted February 19-March 19, 1993, while reviewing anchor bolt installation procedures (MAI-5.1A through MAI-5.1E), the NRC inspector identified that MAI-5.1B, pertaining to wedge bolt anchors, did not require wedge bolt anchors to be preset to the required torque, or the use of bond breakers on wedge bolts installed through freshly grouted pads. This was

not consistent with the procedures for other anchor bolt types, which required the use of bond breakers. When questioned on this, the applicant indicated that if procedures in MAI-5.1B were followed, a bond breaker would not be necessary. Further interviews by inspectors of craft and quality control (QC) personnel found inconsistencies relative to critical installation and inspection steps required to ensure proper installation of wedge bolt anchors through freshly grouted pads as described in section 6.2.5.H of MAI-5.1B. This review was identified for both units as IFI 390,391/93-20-02, "Wedge Bolt Installation Practices". To address issues identified on Unit 1, the licensee changed procedure MAI-5.1B to include the applicable requirements, issued design packages to allow for use of sleeves to prevent grout bonding, and all of the installed grout pads on Unit 1 were inspected and reset. On June 10, 1993, the NRC issued NOV 50-390,391/93-35-01, "Failure to Follow Procedures," with three examples, the first of which was a failure of MAI-5.1B to incorporate the requirements of specification G-32. The agency closed IFI 390/93-20-02 for Unit 1 in IR 50-390,391/94-22, paragraph 3.g, and closed NOV 390/93-35-01 for Unit 1 in IR 50-390,391/94-55, paragraph 8.12.

Inspection Activities: To address this issue for Unit 2, the inspectors performed the following:

- Reviewed the applicant's open item final closure report including any actions associated with PER 145062, which was issued to track required actions for Unit 2.
- Reviewed initial evaluations and corrective actions completed by TVA and to verify adequacy of existing wedge bolt anchors installed in Unit 1 and Unit 2.
- Reviewed calculation CSG-93-CA11 "Concrete Anchorage – Wedge Bolt Anchors Installation in Grout Pads" Rev. 1, to verify the assumption made that only cantilever style wedge bolt anchors, having inadequate gaps between the bolt and the base surface were susceptible to an increase in deflection if grout bonding to the wedge bolt anchor occurred. The evaluation documented re-tightening work at Watts Bar as a result of the identified deficiency. The results of the Unit 1 re-tightening effort were reviewed and the data from CSG-93-CA11 was used to address the extent of condition with Unit 2 and other TVA plants.
- Reviewed the current MAI-5.1B procedure revision to ensure it contained the correct guidance for installing wedge bolt anchors into concrete, installing wedge bolt anchors with grouted base plates, and verification of gaps between base plates and concrete surfaces.
- Reviewed the applicant's power point presentation, lesson plan and qualification cards for wedge bolt anchors to ensure all of the issues identified were incorporated into the training.
- Reviewed safety evaluation report (SER) dated July 2, 2010, for the Unit 2 refurbishment program, which discussed the applicant's commitment to ensuring that any safety-related anchor bolt that does not have proper QC documentation, will be pull tested.
- As part of NRC's review of the Hanger Analysis and Update Program (HAAUP) and related open items, the inspectors previously independently selected and reviewed a sample of QC anchor capacity test results, based on TVA's commitment to provide 100% QC documentation for pipe support anchors. This was documented in Sections OA.1.16 and OA1.17 of IIR 05000391/2011605.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

Based on a review of the applicant's final closure package, and the commitments documented in the SER, dated July 2, 2010, along with the applicant's HAAUP, the inspectors concluded that the applicant initiated appropriate actions to resolve the original wedge bolt anchor deficiency. Based on these proposed actions, IFI 05000391/93-20-02 can be closed; however, future inspection of completed work is possible at the NRC's discretion.

OA.1.10 (Closed) CDR 391/85-29, Annulus Sump Drain Valve Position Discrepancy (IP 35007)

a. Inspection Scope

Background: On August 12, 1985, the applicant reported, in accordance with 10 CFR 50.55(e), a discrepant condition wherein the 10-inch containment annulus sump drain valve (1&2-DRV-77-920) was shown as normally open on Drawing 47W852-1 and normally closed in system operating instruction (SOI)-77.01. If the valve were left open, as constructed, it would provide a flow path directly between the auxiliary building and the reactor building annulus which would impact the ability to maintain the requisite differential pressure established by design. This deficiency was tracked as Significant Condition Report (SCR) WBN NEB 8513.

On September 9, 1985, the applicant submitted its final report to the agency in which the applicant committed to install a loop seal in the 10-inch annulus sump drain line to eliminate the air in-leakage path to the auxiliary building from the annulus sump drain and leave 1&2-DRV-77-920 in the open position, which would then be reflected through revision to SOI-77.01. The loop seal was installed on Unit 1 with engineering change notice (ECN) 5866 and the agency reported closure of the issue for Unit 1 (CDR 390/85-30) in IR 50-390,391/86-14.

Unit 2's annulus sump drain line loop seal was installed by ECN 5867, and was reported to the agency by letter titled "Notification of NRC Commitment Completion," dated December 9, 1985.

Inspection Activities: The inspectors walked down the in-plant configuration of the subject drain line for Unit 2. The inspectors observed the valve 2-DRV-77-920 to be closed and tagged as a Unit1/Unit 2 interface point and an auxiliary building secondary enclosure (ABSCE) component, controlled under temporary instruction (TI)-12.008. The inspectors verified this was reflected on flow Drawing 1-47W852-1. The inspectors reviewed ECN 5867 and confirmed the field configuration met design output requirements. Inspectors observed the draft version of SOI-77.01 which reflects the Unit 2 valve additions to confirm that the valve was to be checked open. Inspectors reviewed Unit 1 surveillances of the valve and loop seal fill as described in Temporary Instruction (TI) 5.008 and TI-5.005, respectively. Additional documents reviewed are in the attachment.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

The inspectors reviewed the applicant's final closure package and performed independent inspection activities to verify the applicant implemented or initiated appropriate actions to resolve the original construction deficiency. Based on these actions, CDR 391/85-29 can now be closed for Unit 2; however, future inspection of completed work may be performed at the NRC's discretion.

OA.1.11 (Closed) CDR 391/86-01: Overpressurization of Volume Control Tank (VCT) (IP 50073 and 50075)

a. Inspection Scope:

Background: In 1985, during the flushing of the chemical and volume control system piping associated with the Unit 2 VCT, the design pressure of 75 lbs/in² (psi) and hydro pressure of 124 psi was exceeded while supplying the VCT using an RHR pump with a discharge pressure of approximately 220 psi. Through measurement of the tank's circumference, deformation was found to have occurred on the tank due to the overpressurization. A similar event occurred on Unit 1, in 1981, where the Unit 1 VCT was overpressurized during a system hydro test which pressurized the VCT to 270 psi. Westinghouse and TVA performed a number of tests and analyses, and determined that the Unit 1 VCT was acceptable for continued use.

Inspection Activities: The inspectors reviewed the applicant's corrective actions that were required to be implemented in order to bound the Unit 2 event and subsequent damage within the Unit 1 event. The inspectors reviewed calculations and evaluations, and interviewed technical personnel to verify that the Unit 2 event and subsequent damage was bounded by the Unit 1 event. The inspectors reviewed the liquid penetrant test evaluation data sheets to verify that an approved procedure was used for the test. The inspector also reviewed the penetrant, developer, and cleaner lot numbers to verify that they were approved and certified for use. The inspectors performed a walkdown of the VCT to verify that the material condition was consistent with the inputs into the technical justification and that the Unit 2 deformation was bounded by the Unit 1 deformation. The inspectors reviewed the revised procedures to verify that hydro and flushing procedures used in construction and pre-operational testing identify the limiting component pressures so that design pressure will not be exceeded. Additional documents reviewed are included in the attachment.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

Based on the review of the applicant's final closure report, program procedures, and technical evaluations, the inspectors concluded that the applicant adequately addressed the issues identified in the CDR. CDR 391/86-01 is closed.

OA.1.12 (Closed) URI 05000391/2012603-03, Use of less conservative later editions of the American Welding Society (AWS) code of record to disposition welding non-conformances. (IP55100 and TI 2512/032)

a. Inspection Scope

Background: URI 05000391/2012603-03 was written to address a concern with the use of less conservative later editions of the AWS D1.1 code. Specifically, as identified in IIR 05000391/2012603 Section OA.1.4, radiographs of welds on the Broadline Polar Crane did not meet the density requirements of the AWS code of record, 1972 edition, but were accepted, as-is, by the applicant because they met the density requirements of the 1975 edition.

Inspection Activities: The issue was reviewed by the NRC program office (Nuclear Reactor Regulation (NRR)) and discussions were held to form a conclusion on the acceptability of using the later edition. The issue was reviewed by NRR and discussions were held to form a conclusion on the acceptability of using the later edition. The inspectors also reviewed the associated PERs, 553409 and 520008, to verify that relevant documentation was being updated to reflect the design change associated with using a different AWS code edition. Additional documents reviewed are included in the attachment.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

Based on discussions with NRR, the inspectors concluded that, for this specific case, it is acceptable for the applicant to use the less restrictive radiographic density requirements from the 1975 edition of AWS D1.1. URI 05000391/2012603-03 is closed.

OA.1.13 (Closed) URI 78-04-02, Reactor Vessel – Nozzle Weld Surface Cracking (IP 57090)

a. Inspection Scope

NRC IIR05000391/2010603, item C.1.10 documented the initial review of URI-78-04-02. This URI was originally documented in IR 50-391/78-04 and was mistakenly identified as URI-78-05-02 and subsequently discussed as URI-78-05-02 in IIR 05000391/2010603. The URI documented a concern with cracking detected near the safe-end or buttered portion of the reactor vessel nozzle weld number 2-068C-W004-01. During this inspection period, the inspectors verified the RT technique used by the licensee was reviewed and approved by the authorized nuclear inspector/authorized nuclear in-service inspector (ANI/ANII), interviewed the RT Level III technician and reviewed documentation concerning compliance of the technique with the ASME Code, Section III, 1971 edition through summer 1973 addenda. Additional documents reviewed are included in the attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Repair and NDE associated with the repair of weld number 2-068C-W004-01 was performed in accordance with the code of record (ASME Section III, 1971 edition through summer 1973 addenda). URI-78-04-02 is closed.

OA.1.14 (Closed) TMI Action Item III.D.3.3: In-Plant Radiation Monitoring (IP 35007)

a. Inspection Scope

Background: TMI Action Item III.D.3.3 required each applicant to provide instrumentation for accurately determining in-plant airborne radioiodine concentrations to minimize the need for unnecessary use of respiratory protection equipment. TVA's efforts to address this issue, for Unit 1, referenced TVA responses to TMI Action Items II.B.3 and II.F.1 which described how TVA would collect and analyze air samples with portable monitoring equipment. The NRC accepted TVA's response and documented inspection efforts in IRs 50-391/84-09 and 50-390/94-06. The applicant plans to utilize the engineering efforts used on Unit 1 to satisfy this item for Unit 2 and will subsequently use similar, if not the same, portable monitoring equipment for Unit 2 as used in Unit 1.

Inspector Activities: The inspectors reviewed the applicant's design criteria document for radiation monitoring systems and the regulatory position as documented in NUREG 0737 (ML051400209) and NUREG-0847, Supplement 16 (ML072060493) to determine if the applicant had correctly bounded the action item requirements for III.D.3.3.

The inspectors conducted interviews with radiation control personnel, design personnel, and control room operators to evaluate implementation of procedures and training for in-plant monitoring and sampling of airborne radioactive iodine. Direct field observations of the radiation control laboratory, auxiliary building areas, control room, radiological survey equipment, and reviews of radiological sampling procedures were conducted to verify implementation of committed actions.

The inspectors reviewed procedures to determine if increasing airborne activity would be detected in the auxiliary building or other plant areas, and if procedures required the radiation control staff to be dispatched to the affected area with hand carried high volume air samplers. The inspectors reviewed information to verify that the high volume samplers were to be equipped with silver zeolite sample cartridges to selectively collect iodine over other elements. Additional documents reviewed are listed in the attachment.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

Based on a review of the applicant's final completion and inspection efforts, the inspectors determined that the measures implemented by the applicant were sufficient to address the requirements of TMI Action Item III.D.3.3. Therefore, TMI Action Item III.D.3.3 is closed.

OA.1.15 (Closed) Non-Cited Violation (NCV) 391/2011603-02: Failures to Adequately Identify the Critical Characteristics for Dedication of Commercial Grade Items (IP 92702)

a. Inspection Scope

Background: A 2011 inspection of the procurement of commercial grade components, that were intended for service in safety-related applications, found that the engineering specifications for dedicating three components did not sufficiently identify the specific criteria that were necessary for verifying that the equipment conformed to the critical characteristics for nuclear service. Examples of deficiencies included illegible dedication criteria (equipment stock codes CDP309G, CDV598Q, and CEF784K), a failure to adequately document verification of seismic qualification (stock code CDP309G), a non-applicable criterion for part number (stock code CDV598Q), and a failure to provide criteria for verifying volumetric capacity of air pressure regulators (stock code CDP309G).

Inspection Activities: The inspectors conducted interviews with responsible personnel in the procurement engineering organization to determine whether personnel understood the requirements for control of commercial grade dedications. The inspectors reviewed the corrected and updated procurement data sheets for each of the three items identified in IIR 391/2011603-02 to verify actions were sufficient to bring the identified deficiencies into compliance with requirements. Additional documents reviewed are listed in the attachment.

b. Observations and findings

No findings of significance were identified. The inspectors found the applicant had documented the evaluation of the deficient condition and the implementation of corrective actions in PER 348970.

c. Conclusion

Based on a review of the actions surrounding PER 348970, the inspectors determined that the conditions identified in the NCV had been restored to compliance with applicable requirements. NCV 391/2011603-02 is closed.

OA.1.16 (Closed) URI 391/87-10-02, Use of Stick-on Wiring Fasteners (IP 92701)

a. Inspection Scope

Background: URI 87-10-02 questioned the adequacy of adhesive back supports to perform the intended function throughout the life of the plant and their ability to withstand a seismic event. For Unit 1, IR 50-390/91-26 documented the review of calculation WBPEV AR8904019 and the modification of specifications and drawings to incorporate requirements for securely mounting mounts to panels, and indicated that the issue would remain open until the field work was completed. Review of the field work for Unit 1 was documented in IR 50-390/93-01 and 50-391/93-01 and IR 50-390/95-64 and 50-391/95-64.

In IIR 05000391/2010603, section OA.1.3; NRC inspectors documented the closure of the Adhesive Backed Cable Support Mount Electrical CAP Sub-issue for Unit 2. This closure included inspection of cable support mounts in control panels in the Unit 2 control room.

Inspection Activities: The inspectors interviewed personnel and reviewed two calculations, WBNPEV AR8904019 and EDQ00299920090002, to verify that the calculations had adequate scope and were still applicable to Unit 2. EDQ00299920090002 documented additional walkdowns of panels done by the applicant for Unit 2. The inspectors reviewed a specification, a procedure, and drawings to verify that they included installation instructions of fastened mounts.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

The inspectors concluded that this issue was adequately resolved. Based on the document review done in this report and the field observations in IIR 0500391/2010603, URI 391/87-10-02 is closed.

OA.1.17 (Closed) NRC BL 78-04: EQ of Certain Stem Mounted Limit Switches inside Reactor Containment (TI 2512/036)

a. Inspection Scope

Background: BL 78-04 was issued due to a review by Westinghouse of the seismic and environmental qualifications of the electrical circuitry used for valve operation of certain stem-mounted limit switches (SMLS) associated with various safety-related valves. The SMLS were found not to be environmentally qualified for Loss-of-Coolant Accident (LOCA) conditions. The SMLS in question were identified as NAMCO Model D2400X or EA-170-302 SNAP LOCK. All NAMCO and SNAP LOCK type switches had been seismically qualified by tests, and only environmental qualification was a concern for this issue.

BL 78-04 was originally addressed by the applicant as part ECN 1549 where the limit switches in question were replaced with environmentally qualified limit switches (NAMCO type EA 180 or EA 740) for Units 1 and 2. In IRs 390/82-13 and 391/82-10, the applicant's response to BL 78-04 was evaluated and subsequently closed.

Inspection Activities: The inspectors reviewed the applicant's open item final closure package, including referenced documents and actions associated with NCO080008035, which was issued to track Unit 2 actions in response to BL 78-04. In reference to the applicant's closure package, the inspectors reviewed calculation EDQ0029992009011, "Watts Bar Nuclear (WBN) Unit 2 – List of 10 CFR 50.49 Components and Cables," Rev. 002 to verify that the applicable SMLS were identified, specified as EQ components, and associated with the appropriate environmentally qualified NAMCO limit switch model.

The inspectors interviewed responsible personnel and reviewed EDCRs 54172, 54923, 53917, 53235, 53421, 54870, 53760, 54070, and 53948 to ensure the applicable SMLS are being replaced with EQ SMLS under the WBN Unit 2 EQ Program. The inspectors also reviewed Purchase Order (PO) 122807 to verify environmentally qualified limit switches were being procured for the specified SMLS. The inspectors conducted field observations of those limit switches replaced in response to BL 78-04 and in-process installation activities of SMLS being replaced under the EQ Program to ensure the appropriate NAMCO limit switches were installed or are being installed.

b. Observations and Findings

No findings of significance were identified. As noted above, the applicant replaced applicable SMLS in Unit 2 required by BL 78-04 and in addition, all EQ limit switches are scheduled to be replaced as part of completing the WBN Unit 2 construction project under the Unit 2 EQ program.

c. Conclusion

Based on the review of the applicant's closure report and the results of the inspection efforts, the inspectors concluded that the applicant adequately addressed the issues identified in the BL. BL 78-04 is closed.

V. MANAGEMENT MEETINGS

X.1 Exit Meeting Summary

An exit meeting was conducted on July 19, 2012, to present inspection results to Mr. Hruby 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 lead inspector described the areas inspected, inspection activities, and discussed the inspection results. The applicant acknowledged the observations provided with no dissenting comments.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

A. Bangalore, Electrical Design, Bechtel
D. Beckley, Electrical Design, Bechtel
J. Brizendine, TVA
P. Cox, Electrical Design, Bechtel
T. Das, Civil Engineer, Bechtel
R. Evans, Procurement Engineering Group, Bechtel
A. Hart, Construction, Bechtel
D. McNeil, Instrument Design, Bechtel
R. Johnson, Site Support, TVA
G. Jones, Electrical Design, Bechtel
G. Scott, Licensing, TVA, Unit 2
J. Temples, I&C Design, Bechtel
M. Tuck, Radcon Tech Support, TVA
J. Ulrich, Radcon Technical Support, TVA
R. Yager, Procurement Engineering Group, Bechtel
I. Zeringue, Engineering and Construction, TVA
R. Hruby, Technical Services, TVA
G. Scott, TVA Licensing

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction and Pre-Construction Activities
IP 37002	Construction Refurbishment Process - Watts Bar Unit 2
IP 48053	Structural Steel and Supports - Work Observation
IP 50073	Mechanical Components - Work Observation
IP 50075	Safety Related Components - Records Review
IP 51063	Electric Cable - Work Observation
IP 51065	Electric Cable - Record Review
IP 52051	Instrument Components and Systems - Procedures
IP 52053	Instrument Components and Systems - Work Observation
IP 52055	Instrument Components and Systems - Records Review
IP 55100	Structural Welding General Inspection Procedure
IP 57060	Nondestructive Examination Procedure Liquid Penetrant Examination Procedure Review/Work Observation/Record Review
IP 57080	Nondestructive Examination Procedure Ultrasonic Examination Procedure Review/Work Observation/Record Review
IP 57090	Nondestructive Examination Procedure Radiographic Examination Procedure Review/Work Observation/Record Review
IP 64051	Procedures - Fire Prevention/Protection
IP 92701	Follow-up
IP 92702	Follow-up on Corrective Actions for Violations and Deviations
IP 92717	IE Bulletins Sent for Information and Information Notice Follow-up

TI 2512/016 Inspection of Watts Bar Nuclear Plant Cable Issues Corrective Action Program Plan
 TI 2512/032 Inspection of Watts Bar Nuclear Plant Welding Corrective Action Program Plan
 TI 2512-036 Inspection of Watts Bar Nuclear Plant Environmental Qualification Special Program

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

None

Opened

None

Discussed

79-24	BL	Frozen Lines (Section OA1.1)
391/83-07	CDR	Transfer Valves to AFW Have Non-Divisional Power (Section OA.1.2)
391/80-06	CDR	AFW Design Deficiency (Section OA.1.3)
391/86-21	CDR	Non-Quality Assurance Data Used in Calculations for Cable Tray and Conduit Loading (Section OA.1.4)
391/95-05	CDR	Loose Connections in Vendor-Wired Electrical Panels (Section OA.1.5)
II.D.3	TMI	Acoustic Detectors for PORV Position Indication (Section OA.1.6)
Item 74	SSER App HH	Acoustic Detectors for PORV Position Indication (Section OA.1.6)
391/79-22-07	CDR	Electrical Junction Boxes in Containment (Section OA.1.7)
391/85-30	CDR	Incorrect Equipment Cable Terminations in Harsh Environments (Section OA.1.8)

Closed

05000391/93-20-02	IFI	Wedge Bolt Installation Practices (Section OA.1.9)
391/85-29	CDR	Annulus Sump Drain Valve Position Discrepancy (Section OA.1.10)
391/86-01	CDR	Overpressurization of VCT (Section OA.1.11)

05000391/2012603-03	URI	Use of less conservative later editions of the AWS code of record to disposition welding non-conformances (Section OA.1.12)
78-04-02	URI	Reactor Vessel – Nozzle Weld Surface Cracking (Section OA.1.13)
III.D.3.3	TMI	In-Plant Radiation Monitoring (Section OA.1.14)
391/2011603-02	NCV	Failures to Adequately Identify the Critical Characteristics for Dedication of Commercial Grade Items (Section OA.1.15)
391/87-10-02	URI	Use of Stick-on Wiring Fasteners (Section OA.1.16)
78-04	BL	EQ of Certain SMLS inside Reactor Containment (Section OA.1.17)

LIST OF DOCUMENTS REVIEWED

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1.2 Ultrasonic Testing Examination and Construction Refurbishment Process (IPs 57080 and 37002)

Procedures

UT-2, Ultrasonic Examination Straight Beam, Rev. 12A
 UT-PCI, Standard Specification for Straight Beam Ultrasonic Examination of Rolled Steel Plates for Special Applications, Rev. 0
 GQP 9.9, Ultrasonic Thickness Measurement, Rev. 8

Corrective Action Documents

PCI Nonconformance Report 901365-002 R1
 PER 501765, Anomalous UT Shell Thickness Measurements on SG 2, 02/02/2012

Drawings

PCI drawing WBR-3001, PLP Penetration Location & Machining Steam Generator 2, Rev. 2

C.1.3 Radiographic Examination (IP 57090)

Procedures

25402-000-4MP-T040-S0126, RT-ASME/ANSI Piping, Rev. 5

C.1.4 Liquid Penetrant Testing Examination and Construction Refurbishment Process (IPs 57060 and 37002)

Procedures

25402-000-4MP-T040-S0125, Liquid Penetrant Examination PT (SR)-ASME, Rev. 9
 GQP-9.7, Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding, Rev. 15

C.1.5 Structural Steel and Supports Work Observation (IP 48053)

Procedures

MAI-5.1B, Wedge Bolt (WB) Anchor Installation, Rev. 21

C.1.6 Instrument Components and Systems – Procedure Review

Procedures

MAI-4.4A, Instrument Line Installation, Rev. 14
 MAI-4.4B, Instrument and Instrument Panel Installation, Rev. 6
 25402-000-GPP-0000-N3401, Instrument and Instrument Line Installation, Rev. 8

Specifications

N3E-934, Instrument and Instrument line installation and Inspection, Rev. 8
 WB-DC-30-4, Design Criteria Document Separation/Isolation

C.1.7 Instrument Components and systems – Work Observation

WO 09-952506-004
 VR-WBC0083, Rosemount 1154 Series H Reference Manual, 3/11/2009

WO 09-953656-008
 WO 110815487, EDCR2 53620 SYS 063 2-ISIV-063-0305B
 WO 110815490, EDCR2 53620 SYS 063 2-RTV-063-0342A
 WO 111005791, EDCR2 53580 SYS 063 2-FE-063-0075

OA.1.2(Discussed) CDR 391/83-07, Transfer Valves to Auxiliary Feedwater (AFW) Have Non-Divisional Power (IP 51063, 51065, 52053 and 52055)

PER 172660, Transfer Valves to AFW Have Non-Divisional Power, 03/2012
 2-45W760-3-4, Main and Aux Feedwater Sys Schematic Diagram, Rev. 1
 1-45W760-3-4, Main and Aux Feedwater Sys Schematic Diagram, Rev. 16
 2-45W760-3-5, Main and Aux Feedwater Sys Schematic Diagram, Rev. 0
 1-45W760-3-4, Main and Aux Feedwater Sys Schematic Diagram, Rev. 12
 2-45W760-3-3, Main and Aux Feedwater Sys Schematic Diagram, Rev. 2
 1-45W760-3-4, Main and Aux Feedwater Sys Schematic Diagram, Rev. 16

OA.1.3 (Discussed) CDR 391/80-06, AFW Design Deficiency (IP 51063, and 51065)

EDQ00223620080011, 125V DC Vital Power Control Voltage Analysis – Unit 2, Rev. 5
 EDQ00023620070003, 125V DC Vital Battery System Analysis, Rev. 14
 2-45W600-3-2, Main & Auxiliary Feedwater Sys Schematic Diagram, Rev. 0
 2-45W600-3-12, Main & Auxiliary Feedwater Sys Schematic Diagram, Rev. 0
 2-45W600-3-4, Main & Auxiliary Feedwater Sys Schematic Diagram, Rev. 0
 2-45W600-3-3, Main & Auxiliary Feedwater Sys Schematic Diagram, Rev. 0

OA.1.4 (Discussed) Use of undocumented sources for data in calculations

Open Items & Commitment Completion Package for PER 144944, QA data for cable weights & outside diameters was not used in calculations, dated 05/02/2012
 EDQ00299920090014, "Unit 2 Class 1E and Appendix R Cables – As-Constructed ICRDS Verification, Rev. 000
 EDQ00299920080001, Unit 2 Class 1E V5 Cable Ampacity, Rev. 007
 EDQ00299920080002, Unit 2 Class 1E V4 Cable Ampacity, Rev. 017
 LSWD 542, Limited Scope Walkdown to verify Cable Routing and Cable Jacket Information for 28 Unit 2 Cables that vary from Cable Installation Records, dated 3/19/2012
 DCN 53334, Replace Ampacity and Voltage Drop Cable Breakages on Trains A & B 480 V Shutdown Boards, Rev. A, dated 5/6/2009

OA.1.5 (Discussed) Loose Electrical Connections in Vendor-Wired Panels

PER 145184, Numerous Loose Connections Documented and Corrected
 Partial Closure Package, NCO950092001

OA.1.6 (Discussed) Acoustic Detectors for Power Operated Relief Valve (PORV) Position Indication

EDCRs
 EDCR 53760, Rev. A

Work Orders
 WO 110800702, Install Accelerometers 2-XE-068-0334, 0304A, 0363-0365

Others

Partial Closure Package, NCO820253028, Rev. 01

OA.1.7 (Discussed) CDR 391/79-22-07: Electrical Junction Boxes in Containment (TI 2512/036)

WBN Open Item Final Closure Package, Tracking Number: PER 172639

OA.1.8 (Discussed) CDR 391/85-30: Incorrect Equipment Cable Terminations in Harsh Environments (TI 2512/036)Closure Package

WBN Open Item Final Closure Package, Tracking Number: PER 143534

Work Orders

WO 112734401

WO 110966863

WO 110966674

OA.1.10 (Closed) Construction Deficiency Report (CDR) 391/85-29, Annulus Sump Drain Valve Position DiscrepancyProcedures

SOI-77.01, Att. 1V, Liquid Waste Disposal Valve Alignment Verification, Rev. 0068

TI-5.008, Inspection of ABSCE Components Located in U2 Areas, Rev. 16

TI-5-005, Monthly Drain Trap Fill and Inspection, Rev. 0

Design

ECN 5867, Installation of Water Trap in the Annulus Drain Piping to Maintain Annulus Pressure Requirements Defined by EGTS PreOp Test, Rev. 0

Corrective Action Documents

SCR WBNNEB8513, Containment Negative Pressure Requirement During DBE/Annulus Flooding Violated by Design, 7/17/1985

PER 172781, TROI Item (50.55e) WBN NEB8513, 6/1/2009

Drawings

47W479-3, Mechanical Drains and Embedded Piping (Equipment Drains), Rev. 10

47W476-1, Mechanical Annulus Floor Drains and Embedded Piping, Rev. 10

1-47W852-1, Mechanical Flow Diagram Floor and Equipment Drains, Rev. 23

2-47E235-66, Aux Bldg 692' Pen. Room Environment, Rev. 1

2-47E235-44, Annulus Environmental Data, Rev. 0

OA.1.11 (Closed) CDR 391/86-01: Overpressurization of Volume Control Tank (VCT) (IP 50073 and 50075)

PER 172714, Overpressurization of the volume control tank, 05/2012

WAT-D-5148, Watts Bar Unit 1 Volume Control Tank, 10/1982

QCP-4.13-PTM, Liquid Penetrant Examination, Rev. 0

QCP-4.13-FU&VM, Fit-Up and Visual Examination, Rev. 0

WBN-QCP-4.13-PTM, Process Specification, Rev. 3

Certificate of Conformance, Cleaner, 03/1982

Certificate of Conformance, Developer, 04/1982

Certificate of Conformance, Penetrant, 04/1982

OA.1.12 (Closed) URI 05000391/2012603-03, Use of less conservative later editions of the American Welding Society (AWS) code of record to disposition welding non-conformances. (IP55100 and TI 2512/032)

PER 520008, NRC Unresolved Item - AWS D1.1 Code Editions

PER 553409, NRC ID'd - A review of NRC Inspection Report 2012-603, (URI) 2012603-03

OA.1.13 (Closed) URI 78-04-02 (URI 78-05-02), Reactor Vessel – Nozzle Weld Surface Cracking (IP 57090)

Watt's Bar Unit 2 Radiography Technique Demonstrations

OA.1.14 (Closed) TMI Action Item III.D.3.3: In-Plant Radioiodine Monitoring

Procedures

EPIP-9, CECC Emergency Environmental Radiological Monitoring, Rev. 47, dated 6/22/2012

EPIP-14, Radiological Control Response, Rev. 22, dated 06/23/2010

Other

Final Closure Package, NCO-080008062, Complete Modifications on Unit 2 for In-Plant Monitoring of Iodine Radiation, Rev. 1

Letter dated December 20, 2011 from TVA to NRC Document Control Desk on the status of regulatory framework for the completion of construction and licensing for Unit 2

WB-DC-40-24, Radiation Monitoring, Rev. 21

OA.1.15 (Closed) Non-Cited Violation (NCV) 391/2011-603-02: failures to adequately identify the critical characteristics for dedication of commercial grade items (IP 92702)

PER 348970, NRC Findings on Commercial Grade Dedication Packages, initiated 3/31/2011
PDS CDP309G (RIMS T49 110616 828), Leslie Controls, Inc. Pressure Regulators, Rev. 5, dated 6/16/2011

PDS CDV598Q (RIMS T49 110607 814), Heinemann Circuit Breaker, Rev. 8, dated 6/7/2011

PDS CEF784K (RIMS B25 110512102), Dwyer Differential Pressure Switch, Rev. 5, dated 5/11/2011

Technical Report EQ11-0245, Pressure Regulator, dated 11/15/2011

Calculation MDQ00003220090356, Determination of Control and Service Air Flow for Unit 1 & 2, dated 8/25/2009

OA.1.16 (Closed) Unresolved Item (URI) 391/1987-10-02, use of stick-on wiring fasteners

Drawings

45W1640, Wiring Diagrams Control Boards Critical Wiring Braid Installation, Rev. 3

45W3000-1, Cable/Wiring Separation Requirements Notes, Rev. 1

Procedures

MAI 3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up To 15,000 Volts, Rev. 29

Other

Specification G-38, Installation, Modification, and Maintenance of insulated cables rated up to 15,000 volts, Rev.20

Calculation WBN-EEB-EDQ00299920090002, Internal Panel Separation Evaluation for Common, Unit 1, and Unit 2 Enclosures Containing Unit 2 Safety Related Cables, Rev. 0

Calculation WBPEV AR8904019, Evaluation of Adhesive Backed Cable Support Mounts, Rev. 2

OA.1.17 (Closed) NRC Bulletin (BL) 78-04: Environmental Qualification (EQ) of Certain Stem Mounted Limit Switches (SMLS) inside Reactor Containment (TI 2512/036)

Closure Package

WBN Open Item Final Closure Package, Tracking Number: NCO080008035

Calculation

EDQ0029992009011, "Watts Bar Nuclear (WBN) Unit 2 – List of 10 CFR 50.49 Components and Cables," Rev. 002

EDCRs

EDCR 54172, Rev. A

EDCR 54923, Rev. A

EDCR 53917, Rev. A

EDCR 53235, Rev. A

EDCR 53421, Rev. A

EDCR 54870, Rev. A

EDCR 53760, Rev. A

EDCR 54070, Rev. A

EDCR 53948, Rev. A

Purchase Order

PO 122807, NAMCO Limit Switches

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
ANI	Authorized Nuclear Inspector
ANII	Authorized Nuclear In-service Inspector
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
B & PV	Boiler and Pressure Vessel
BL	Bulletin
CAP	Corrective Action Program
CAQR	Condition Adverse to Quality Report
CCS	Component Cooling Water
CDR	Construction Deficiency Report
CFR	Code of Federal Regulations
CLS	Central Laboratories (TVA)
ECN	Engineering Change Notice
ECP	Employee Concerns Program
EDCR	Engineering Document Construction Release
ERCW	Essential Raw Cooling Water System
EQ	Environmental Qualification
FSAR	Final Safety Analysis Report
FSV	Flow Solenoid Valve
HAAUP	Hanger and Analysis Update Program
HVAC	Heating, Ventilation, and Air Conditioning
ICRDS	Integrated Cable and Raceway Design System
IIR	Integrated Inspection Report
IMC	Inspection Manual Chapter
IP	Inspection Procedure (NRC)
IR	Inspection Report (NRC)
LOCA	Loss-of-Coolant Accident
LOP/LOF	Lack of Penetration/Lack of Fusion
LSWD	Limited Scope Walkdown Document
MAI	Modification and Addition Instructions
MSB	Main Stream Break
MT	Magnetic Particle Test
M&TE	Measuring and Test Equipment
NCR	Non-Conformance Report
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NEDP	Nuclear Engineering Departmental Procedure
NQAP	Nuclear Quality Assurance Plan
NRC	Nuclear Regulatory Commission
NRR	NRC Office of Nuclear Reactor Regulation
NSVR	North Steam Valve Room
PER	Problem Evaluation Report
PI&R	Problem Identification and Resolution
PLP	Potential Loose-Part
PM	Preventative Maintenance
PO	Purchase Order
PORV	Power Operated Relief Valve
PQR	Procedure Qualification Record
PSS	Power Service shop
PT	Penetrant Testing

PWR	Pressurized Water Reactor
QA	Quality Assurance
QC	Quality Control
RCS	Reactor Coolant System
REV.	Revision
RT	Radiographic Test
RTV	Room Temperature Vulcanizing
SER	Safety Evaluation Report
SL	Severity Level
SMLS	Steam-Mounted Limit Switches
SP	Special Program
SSC	Systems, Structures, and Components
TI	Temporary Instruction
TMI	Three Mile Island
TVA	Tennessee Valley Authority
UNID	Unit Identification
URI	Unresolved Item
UT	Ultrasonic Test
VCT	Volume Control Tank
VLFF	Very Low Frequency
VT	Visual Test
WBN	Watts Bar Nuclear Plant
WO	Work Order