



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

May 1, 2012

Mr. Michael D. Skaggs
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6A Lookout Place
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Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2012603**

Dear Mr. Skaggs:

On March 31, 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 April 16, 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.

Based on the results of this inspection, the enclosed report documents three NRC-identified findings and one self-revealing finding which were determined to involve violations of NRC requirements. However, because the findings were Severity Level IV violations and were entered into your corrective action program, the NRC is treating them as non-cited violations (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any of the NCVs in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTENTION: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at the Watts Bar Unit 2 Nuclear Plant.

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

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000391/2012603 w/Attachment

cc w/encl: (See next page)

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*** Previous Concurrence**

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Letter to Michael D. Skaggs from Robert C. Haag dated May 1, 2012.

SUBJECT: WBN NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2012603

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2012603

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: 1260 Nuclear Plant Rd
Spring City TN 37381

Dates: February 19 – March 31, 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

- A self-revealing finding and Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," was identified for the applicant's failure to perform work on the appropriate equipment as specified in work instructions associated with WO 112412320. (Section C.1.1)
- A SL IV NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for failure to incorporate design requirements into refurbishment activities associated with the Stow remote valve operators. (Section C.1.2)
- A SL IV NCV of 10 CFR 50 Appendix B Criterion XVII, "Quality Assurance Records," was identified for failure to adequately maintain QA records (radiographic film) in a condition such that they were capable of providing evidence of quality. (OA.1.4)
- A SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," with two examples, was identified for failure to identify inappropriate use of Quality Level 3 (QL) material. Specifically, QL 3 rivets were being used in a QL I/II application. (OA.1.10)
- The inspectors concluded that concerns pertaining to several open items, including Unresolved Items (URIs), NCVs, NRC Bulletins (BL), 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, pre-operational testing 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 491434, dealing with a human performance event, where Unit 1 backup pressurizer heater cables were disconnected when the work instructions specified that the Unit 2 pressurizer heater cables should be disconnected. This is further discussed in section C.1.1, below.

Also, a Problem Identification and Resolution (PI&R) team inspection was conducted during the inspection period; however, the results will be documented in a separate report numbered 05000391/2012612.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

For the issues reviewed during this inspection period by the resident inspector staff, PERs were properly identified, addressed, and resolved. For the issues reviewed during the PI&R team inspection, the results will be documented in report numbered 05000391/2012612.

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 verified that significant problems were documented under the corrective action program and were being properly identified, addressed, and resolved by TVA.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

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

Q.1.3 Document Control (IP 35742)

a. Inspection Scope

The inspectors reviewed the program elements of document control that are identified in the TVA Nuclear Quality Assurance Plan (NQAP) to verify that administrative controls are being effectively implemented during the WBN 2 Construction Completion Project. The Engineering Document Construction Release (EDCR) Program was reviewed, as it relates to the review, approval, management and control of engineering related EDCR deliverables, for the WBN 2 CCP. Select closed EDCR work packages, from a list of closed EDCR's for the last six months, were reviewed against program requirements. Select engineering drawings were reviewed for proper preparation, revision, review and approval and issuance for the WBN 2 Construction Completion Project. Bechtel Engineering Drawings, Bechtel Field Change Request Instructions and TVA procedure NEDP-3, "Drawing Control Program," Rev.15, were reviewed against requirements of the TVA NQAP. Review of a representative sample of select master drawings from the TVA Business Support Library (BSL) and comparison to Configuration Control Drawings, residing in WBN2 control room, was performed. Additional documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Administrative controls are effectively implemented so that up-to-date drawings are being provided to the plant in a timely manner.

Q.1.4 Measuring and Test Equipment (IP 35750)

a. Inspection Scope:

The inspectors reviewed the program elements the TVA NQAP to verify applicable portions of requirements for Measuring & Test Equipment (M&TE) are being implemented. These requirements are implemented in TVA procedure NPG-SPP-6.4, "Measurement and Test Control," Rev.0. A representative sample of M&TE instruments, stored in the WBN1 Calibration Laboratory, were selected from a tool inventory list of equipment for review and physical inspection to determine if they were being properly stored in accordance manufacturers and programmatic requirements. The most recent calibration record for each instrument was reviewed. A representative sample of recently completed work packages was selected and all instruments, used in the work packages, were traced back to calibration records. PERs for lost, stolen, or damaged M&TE pieces were reviewed for proper documentation and corrective actions. TVA and Bechtel audit reports which addressed M&TE were reviewed. Interviews of Bechtel craft

workers and a Bechtel craft supervisor were conducted from a questionnaire prepared by the inspectors to assess worker familiarity of the requirements of NPG-SPP-6.4. Additional documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified

c. Conclusions

Administrative controls are effectively implemented so that only accurate and properly calibrated M & TE is issued and that individuals are qualified or properly supervised in the use of this equipment at WBN2.

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) 112412320, involving the very low frequency (VLF) testing of cable 2PP800A.
- WO 111234754, involving the hydrostatic testing of unqualified portions of the common component cooling water (CCS) system.

b. Observations and Findings

Introduction: A self-revealing finding and Severity Level (SL) IV non-cited violation (NCV) of 10 Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," was identified for the applicant's failure to perform work on the appropriate equipment as specified in work instructions associated with WO 112412320.

Description: WO 112412320 was implemented to complete VLF testing on cable 2PP800A, between breaker compartment 20 on 6.9kV shutdown board 2A-A and the 6.9kV/480VAC transformer (2-OXF-341A-A) for pressurizer heater backup group 2A-A. VLF testing requires the cable to be determined from the connected equipment. Work documents associated with the work order reflected that cable 2PP800A had been disconnected at the shutdown board end on November 21, 2011, and at the transformer end on December 14, 2011.

On January 17, 2012, during preparations for implementing the VLF test, a field engineer and craft personnel removed a cover from transformer 2-OXF-68-341A-A and discovered that cable 2PP800A was still connected, contrary to lead lift/land sheet accompanying the work order. The work was immediately stopped to resolve the apparent documentation discrepancy. It was later discovered that cable 1PP800A associated with Unit 1 transformer 1-OXF-68-341A-A had been disconnected in error.

The inspectors determined that this performance deficiency was more than minor in that the work was performed outside the boundaries of the approved work documents and outside of protective clearances (i.e., hold-order or tag-out), risked personnel safety, presented a significant fire hazard, and jeopardized backup pressurizer heater capacity as required in Unit 1 Technical Specification requirement 3.4.9. The technical specification requires two operable groups of heaters of the four available. The inspectors determined this finding to be of very low safety significance, SL IV, because it only affected one of four groups of heaters and the other three groups remained available as demonstrated by their most recent surveillances. This issue was entered into the corrective action program as PER 491434 with an associated root cause analysis, the review of which is documented in section Q.1.1, above. The inspectors reviewed this finding for cross-cutting aspects and determined that a lack of in-the-field reinforcement of human error prevention tools and an insufficient perception of the risks present in the subject WO resulted in these tools not being used commensurate with the risk of the assigned task. This is reflected in the work practices component of the human performance cross-cutting area (H.4(a)).

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to this, the applicant failed to perform work on the appropriate equipment as specified in work instructions. Specifically, Unit 2 construction personnel errantly performed the determination of medium voltage power cables from the terminals of the Unit 1 pressurizer backup heater transformer 1-OXF-68-341A-A instead of the proper Unit 2 transformer 2-OXF-68-341A-A. This finding was determined to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the issue was entered into the applicant's corrective action program as PER 491434, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000391/2012603-01, Failure to Implement Cable Determination Activities In Accordance With Prescribed Work Instructions Affecting Operating Unit.

c. Conclusions

With the exception of the above noted self-revealing finding, 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 Mechanical Components – Work Observation and Construction Refurbishment Process (IPs 50073 and 37002)

a. Inspection Scope

The inspectors performed an independent verification into the adequacy of the applicant's valve refurbishment program, specifically with regard to the Stow brand (now Elliot-Stow) remote valve operators used throughout the plant. The inspectors reviewed installations against the requirements specified in applicant procedures and vendor documents. Applicant procedures were compared against the vendor documents to ensure that all design attributes were translated or referenced as appropriate to ensure that installations were performed satisfactorily with procedures of sufficient technical adequacy. The inspectors questioned about any additional or unique training requirements for work associated with these components. The inspectors also viewed the refurbishment activities for shelf-life limits, appropriate inspections with clear acceptance criteria, corrective action implementation, and testing within an established test program. Additional documents reviewed are listed in the attachment.

The following samples were inspected:

- IP 50073 Section 02.02.c - one sample
- IP 37002 Section 02.02.b – one sample

b. Observations and Findings

The inspectors identified the following NCV:

Introduction: A SL IV NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for failure to incorporate design requirements into refurbishment activities associated with the Stow remote valve operators.

Description: The inspectors found that the applicant's valve refurbishment procedure, 25402-000-GPP-0000-N3525, "Valve Refurbishment (SR/QR)," Revision (Rev.) 0002, Appendix D, "Stow Reach Rod Refurbishment," lacked specific guidance relative to verification of minimum bend radius. Further, the inspectors found four installations in the plant (2-BYV-062-538, 2-DRV-074-509, 2-DRV-074-516, and 2-DRV-074-517), for which the applicant had taken credit for valve refurbishment completion, but which violated the vendor-specified minimum bend radius.

Additionally, the vendor literature specified that the o-rings within the through-wall operator stations are to be inspected for damage or deterioration every year and are only qualified for a serviceable life of approximately 5 years – and should be changed out within that time. The applicant's refurbishment procedure did not call for either the inspection or the change-out of these o-rings, many of which may have been in layup service for in excess of 30 years. Applicant records of the refurbished components did not demonstrate that these o-rings had been inspected or replaced.

While the applicant's procedures called for the inspection of the remote operator assembly for loose, damaged, or missing fasteners, the inspectors found that both applicant procedures provided no guidance on installation acceptability criteria for clamps supporting the remote operator sleeve between the through-wall operator stations and the valve locations. The vendor literature for the flexible shaft assembly notes that "clamps are used at intermediate positions to prevent deflection or movement

of the shaft while valves are operated.” No further guidance on limits or installation requirements were found by inspectors within the vendor literature. The inspectors found numerous installations in the field with completely unsupported flexible shafts, in lengths ranging from several feet to tens of feet.

The performance deficiency was determined by the inspectors to be more than minor in that it represented and improper or uncontrolled work practice that can impact quality or safety, involving safety-related structures, systems and components (SSCs). The inspectors determined this finding to be of very low safety significance, i.e. SL IV, in accordance with section 6.5 of the Enforcement Policy in that this violation is not representative of a breakdown in a QA process. The inspectors evaluated this finding for cross-cutting aspects and determined that none exist.

Enforcement: 10 CFR 50, Appendix B, Criterion III, “Design Control,” requires, in part, that measures shall be established to assure that design requirements are translated into specifications, drawings, procedures, and instructions. Contrary to this, the applicant failed to ensure that design attributes essential to the operational capability of safety-related remote valve operators were addressed through the applicant’s refurbishment process. This finding was determined to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the examples supporting the violation were entered into the applicant’s corrective action program as PER 514641, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000391/2012603-02, Failure to Translate Stow Remote Valve Operator Design Requirements to Refurbishment Procedures.

c. Conclusions

With the exception of the above listed NCV, field refurbishment of safety-related mechanical components was performed per the approved refurbishment program and procedures.

C.1.3 Piping – Work Observation (IPs 49063 and 37002)

a. Inspection Scope

The inspectors observed work activities associated with the construction refurbishment and acceptance of safety-related piping systems and passive components within the CCS system. The inspectors verified that the work instructions and procedures identified requirements and provisions for ensuring that the material condition of accessible portions of piping systems was evaluated and documented prior to final assembly of associated components. The inspectors verified that personnel were adequately qualified for the roles they performed and that procedures detailed necessary actions and were followed by the craft. The inspectors also verified that work activities promptly identified any failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances in safety or quality-related SSCs, and that material identification and control measures were in place and appropriately implemented. Additional documents reviewed are listed in the attachment.

The following area was inspected:

- Hydrostatic testing of unqualified Unit 2 portions of the CCS system

The following sample was inspected:

- IP 49063 Section 02.02 - 1 sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Hydrostatic testing was performed per the associated work order and test package instructions.

C.1.4 Procedures – Fire Prevention/Protection (IP 64051)

a. Inspection Scope

The inspectors observed fire operations staff personnel performing fire extinguisher annual preventative maintenance (PM) on three dry powder ABC extinguishers identified for fire watch use. The inspectors then took a limited set of field-verifiable attributes from PM guidance into the field and evaluated seven deployed 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 extinguishers were observed:

- U2-FW-003
- U2-FW-165
- U2-FW-078
- U2-FW-094
- U2-FW-121
- U2-FW-143
- U2-FW-108
- U2-FW-131
- U2-FW-138
- U2-FW-017

The following sample was inspected:

- IP 64051 Section 02.07 – 1 sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Applicant fire fighting staff is adequately maintaining equipment for the purposes of suppressing fires within the fire watch immediate response spectrum.

C.1.5 Nuclear Welding General (IP 55050)

a. Inspection Scope

The inspectors observed repair work of weld 2-001A-D006-09 C0R2 to determine whether welding was conducted in accordance with the Field Welding Checklist, WR-5. Specifically, the inspectors observed the following to determine whether the repair was welded in accordance with American Society of Mechanical Engineering (ASME) Section III, 1971 edition, 1973 winter addenda:

- welding procedure was at the work station
- welding filler material was the correct type
- the weld joint had been prepared, cleaned, and inspected
- the preheat and interpass temperatures met procedure requirements
- interpass cleaning was conducted
- heat input was controlled in accordance with procedures

The inspectors reviewed welding records for welds 2-001A-D006-16 C0R0, 2-003A-T101-12 C0R0, 2-001A-D009-30 C0R0, and 2-001A-D006-09 C0R1 to determine whether impact testing requirements met ASME Section III, 1971 edition, 1973 winter addenda requirements. The inspectors reviewed welding procedures P1-T(CVN+10), P1-A-Lh(CVN+10), and P1-AT-Lh(CVN+10) and associated procedure qualification records (PQR) to determine whether ASME Section III, 1971 edition, 1973 winter addenda requirements were met. Specifically, the inspectors reviewed impact testing records for PQRs. The inspectors reviewed filler metal certified material test reports to determine whether required impact testing met ASME Section III, 1971 edition, 1973 winter addenda. Additional documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors concluded the observed welding activities and reviewed welding records met the requirements of ASME Section III, 1971 edition, 1973 winter addenda.

C.1.6 Electrical Components and systems – Work Observation (IP 51053)

a. Inspection Scope

The inspectors observed in-process work, interviewed design and field engineers, interviewed craft workers, examined completed work, and reviewed documentation for completed installations. The observations of work were performed to determine whether work and acceptance testing was guided by documented instructions or drawings, whether installed components were adequately identified and placed in the specified configurations, whether installed equipment and adjacent equipment were protected against possible damage, whether documentation of work was complete and timely, and whether field changes and nonconforming conditions were properly identified and dispositioned. Additional documents reviewed are listed in the attachment.

The inspection samples included work performed under the following work packages:

- WO 110750965, Replace MCC Buckets in 480V Boards
- WO 110849214, Restore inboard side of containment electrical penetration 2-PENT-293-0034 to service ready condition
- WO 110870221, Remove Hand Switches and Replace Selected Hand Switches in accordance with EDCR 2-54870
- WO 12333332, Replace solenoid valve and pressure regulator for Purge Air Supply Isolation Damper 2-FSV-030-0294-A

The following samples were inspected:

- IP 51053 Section 02.02.d – four samples each

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that in-process and completed work was implemented in accordance with approved instructions and drawings. For the samples reviewed in this inspection, the inspectors concluded that the applicant's requirements and NRC regulations were met.

P.1 Pre-Operational Activities

P.1.1 Preoperational Test Procedure Review (IP 70300) (IMC 2513)

a. Inspection Scope

The inspectors reviewed pre-operational test 2-PTI-099-04, "Safeguards System," Rev. 0000 to verify the specificity and conciseness of the procedure, and readability of charts.

The following samples were inspected:

- IP 70300 Section 02.10 - one sample
- IP 70300 Section 02.12 - one sample

b. Observations and findings

No findings of significance were identified.

c. Conclusion

Additional inspection effort will be required to complete the review of this preoperational test instruction. No conclusions can be made at this time.

IV. OTHER ACTIVITIES

OA.1.1 (Discussed) Welding Corrective Action Program (CAP) Sub-issue 10: Independent Weld Deviation Reports (IDRs) (IP 55100, IP 55050, and TI 2512/032)

a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-issue 10 "Independent Weld Deviation Reports," is a collection of 474 IDRs. For Unit 1, they were reviewed and issues, found to be conditions adverse to quality, were corrected prior to startup.

For Unit 2, the applicant twice reviewed all IDRs for the possibility of applicability to Unit 2. The applicant found that none of the IDRs were potentially applicable to Unit 2 and documented those results in calculation WCG-1-315.

Inspection Activities: The inspectors reviewed WCG-1-315 and sampled 8 IDRs to verify non-applicability to Unit 2. Additional documents reviewed and IDRs sampled are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified. None of the sampled IDRs were applicable to Unit 2.

c. Conclusions

The inspectors reviewed the Welding CAP final closure report and concluded that the applicant's actions to address this sub-issue for Unit 2 were adequate. No additional inspection of this sub-issue is needed and it can be closed with closure of the Welding CAP.

OA.1.2 (Discussed) Welding CAP Sub-issue 11: Main Steam Impingement Sleeve (IP 55100 and TI 2512/032)

a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-Issue 11, "Main Steam Impingement Sleeve," was created to address a concern about issues in welds on the main steam impingement sleeves by the Unit 1 Auxiliary Building.

The welds on the Unit 1 impingement sleeves were ultrasonically examined and a slugged weld was found. This issue was at first analyzed and found to be acceptable; however, the applicant later repaired the weld.

For Unit 2, the welds in the impingement sleeves have also been found to be deficient. The applicant's planned corrective actions were to weld steel plates over the welds to bridge over them and carry the design loads instead of relying on the original welds.

Inspection Activities: The inspectors reviewed PERs 408391 & 144160, calculation WCG2913, EDCR 58676, applicable drawings, and met with the lead engineer to verify that the steel plates would enable the impingement sleeves to perform their safety function. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the Welding CAP final closure report and concluded that the planned corrective actions were adequate to ensure the impingement sleeves would be capable of performing their safety function. Due to the conclusions of this inspection and previous inspection activities documented in inspection report 05000391/2011607, this sub-issue needs no additional inspection. This sub-issue can be closed with closure of the Welding CAP.

**OA.1.3(Discussed) Welding CAP Sub-issue 12: North / South Valve Rooms
(IP55100 and TI 2512/032)**

a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-Issue 12, "North / South Valve Rooms," was created to address an employee concern about welding over cracks in structural steel in the valve rooms.

On Unit 1, the welds were examined by ultrasonic testing (UT) and visual testing (VT) as applicable. As a result of visual examination, 46 welds were found to be deficient and needed engineering justification. Also, four welds in fabricated beams were examined by magnetic particle testing (MT) for lamellar tearing, which was found and repaired in one of the four beams.

Corrective actions on Unit 2 were the same as Unit1. Visual examinations were done in the early 1990's and MT was done on the identical welds in the fabricated beams. Deficient welds found by VT were justified for use-as-is and lamellar tearing found by MT was repaired.

Inspection Activities: The inspectors reviewed PERs 393639, 346359, 144146, & 346359, FCR 57693-A, and Calculation WCG1616, to verify the adequacy of the applicant's use-as-is justifications and also to verify that design changes met the requirements of the QA Program. Also, the inspectors reviewed the drawings and inspected the repairs of the lamellar tears to verify adequate implementation of the corrective actions. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the Welding CAP final closure report and concluded that the applicant's corrective actions were adequate to ensure that the structural steel, in the north and south valve rooms, was capable of performing its safety function. Previous inspection activities have been done for this sub-issue (and identical CDR 83-55) and are documented in inspection reports 05000391/2011603, 05000391/2011605, & 05000391/2011607. This sub-issue needs no additional inspection effort and can be closed with the closure of the Welding CAP.

OA.1.4 (Discussed) Welding CAP Sub-issue 17: Welds on Vendor Supplied Equipment (IP 55100, IP 55050, and TI 2512/032)

a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-issue 17, "Welds on Vendor Supplied Equipment," was created to address deficient welds found on vendor supplied equipment.

For Unit 1, the applicant evaluated the welds and tracked them to closure with the corrective action program.

For Unit 2, the applicant reviewed the Unit 1 evaluations and found that with two exceptions all equipment in the scope of this sub-issue was either fixed during Unit 1 work or was not applicable to Unit 2. The two exceptions were:

Pittsburgh Des Moines Refueling Water Storage Tank (RWST)

In the late 1980's a review of the vendor's weld radiography for the RWSTs found inadequate welds and films. For Units 1 and 2, the welds were repaired and re-radiographed as necessary to restore compliance. For Unit 2, the applicant did a record review and found that all but one weld had been accepted by TVA in 1989. That weld was scheduled for repair and tracked by PER 144061.

Broadline Polar Crane

The polar crane had full-penetration groove welds that were contractually required to be radiographically examined. Upon review, the welds and radiographic film were found not to meet the requirements. For Unit 1, the welds and film were accepted as-is after engineering analysis. For Unit 2, the deficient welds are being tracked by PER 144061 and found to be acceptable for use as-is in calculation WBP-MTB-002. The film was reviewed by a Level III interpreter and found not to meet code density requirements but to be interpretable.

Inspection Activities: The inspectors reviewed the "Welds on Vendor-Supplied Equipment" section of the applicant's "Welding Corrective Action Program Closure Report" and PER 144061 to verify the non-applicability of most of the vendor welds and the adequacy of the applicant's planned corrective actions for the two exceptions. Also, the inspectors chose a sample of welds from the RWST and reviewed the records (including radiography to verify their adequacy. The welds chosen were: 4V1, 2H10, 1H9, and 12C-3. The inspectors also verified that welds showing acceptable slag inclusions were made with the shielded metal arc welding process and that the welding procedures were retrievable as lifetime QA records. Lastly, the inspectors reviewed Calculation WBP-MTB-002 Rev. 2, corrective action documents, and met with the

responsible engineer to discuss the acceptability of the corrective actions. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

The inspectors found one unresolved item (URI) and one NCV.

- (1) Introduction: The inspectors identified one URI associated with the use of less conservative portions of later editions of the American Welding Society (AWS) code of record to disposition non-conforming conditions.

Description: The inspectors reviewed the Welding Corrective Action Program Closure Report, (RIMS T03 120222 002). Section 5.3.17.5 of that report dealt with the Broadline Polar Crane weld and weld radiography non-conformances. The report stated that after review in 1988, the film was found to be in non-compliance with the requirements of the bridge criteria section of AWS D1.1, 1972 edition, in that the density of the film exceeded the maximum allowed by the code (3.5). The inspectors noted that the applicant accepted the film as acceptable for interpretation because, "AWS D1.1 changed the upper limit density limit to 4.0 in 1975" and "Most industry standards consider densities up to 4.0 as readily interpretable." The inspectors questioned the use of less conservative later edition of the AWS code of record to accept welding non-conformances.

The applicant created PER 517736 to address this issue. Input from the NRC's office of Nuclear Reactor Regulation (NRR) is needed to resolve this issue. Consequently, this issue is identified as URI 05000391/2012603-03, Use of less conservative later editions of the AWS code of record to disposition welding non-conformances.

- (2) Introduction: A SL IV NCV of 10 CFR 50 Appendix B Criterion XVII, "Quality Assurance Records," was identified for failure to adequately maintain QA records (radiographic film) in a condition such that they were capable of providing evidence of quality.

Description: As described in the background section above, the Unit 1 and 2 RWSTs were added to the Welding CAP in the 1980's and found to have deficient welds and radiographs. In or around 1989, the applicant did repairs and re-radiography to restore compliance. In 2010, the applicant reviewed the corrective action records from the 1989 time frame and found that all but one weld had been accepted by the applicant. The inspectors chose a sample of RWST welds and reviewed the records to verify that compliance had been restored. During this review the inspectors noted that several 1989 radiographs of the repairs were unreadable such that they could not be used to provide evidence of weld quality after the repair. In addition, the inspectors learned that, in 2010, the applicant only reviewed corrective action documents and did not review the actual film.

This finding was found to be more than minor because it represented an inadequate process that adversely affected QA records of the RWST, a safety-related SSC, and the records could not be easily created. The finding was of low safety significance because the process was not indicative of a breakdown in the applicant's QA program for construction; and was not the result of multiple and recurring significant deficiencies associated with a construction activity. This finding does not have a cross cutting aspect associated with it.

Enforcement: 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records," states, in part, that "Sufficient records shall be maintained to furnish evidence of activities affecting quality."

Paragraph 6.3.2 A of the current revision of the TVA Nuclear Quality Assurance Program states "Sufficient records and documentation shall be prepared and maintained to provide evidence of the quality of items or activities affecting quality. QA records shall be legible, complete, and identifiable to the item involved."

Additionally, Appendix B of the current revision of the TVA Nuclear Quality Assurance Program commits Watts Bar to NRC Regulatory Guide 1.88 Rev. 2, which endorses ANSI N45.2.9, 1974 for collection storage and maintenance of quality assurance records.

Section 2.2 of ANSI N45.2.9, 1974 defines a lifetime record as any meeting one or more of the following:

1. Those which would be of significant value in demonstrating capability of safe operation.
2. Those which would be of significant value in maintaining, reworking, repairing, replacing, or modifying the item.
3. Those which would be of significant value in determining the cause of an accident or malfunction of an item

Also, Appendix A of ANSI N45.2.9, 1974 lists weld radiographic test final results as a lifetime record.

Contrary to the above, before March 8, 2012, the applicant failed to maintain QA records sufficient to provide evidence of the quality of items or activities affecting quality. Specifically, the applicant failed to maintain weld radiographs for the Unit 2 RWST, which were classified as lifetime QA records, in a condition whereby they would be able to provide evidence of quality. Five radiographs were found to be in a degraded condition, several of which were unreadable. These were welds 1H10 Sections 2-3, 4-5, and 6-7, and weld 2H10 Sections 17-18 and 18-19.

This finding was found to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and it was entered into the applicant's corrective action program as PER 517736, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000391/2012603-04, Failure to Maintain Weld Radiographs.

c. Conclusions

One URI and one NCV were found associated with this sub-issue. Otherwise the inspectors concluded that the other reviewed records and procedures met the applicable requirements.

OA.1.5(Discussed) Welding CAP Sub-issue 20: Undersize Nozzle Welds in ASME Components (IP 55050 and TI 2512/032)a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-issue 20, "Undersize Nozzle Welds in ASME Components," was created to address undersized nozzle-to-shell welds on tanks, filters, and heat exchangers in ASME Class 2 and 3 components (related to Notice of Violation (NOV) 390/89-200-41)

For Unit 1, the applicant inspected accessible nozzle-to-shell welds on components most susceptible to failure or of most significance in the event of weld failure. Of 874 welds inspected, 105 were found to be less than minimum size, and 6 did not meet minimum strength requirements and needed repair.

For Unit 2, the applicant did a review and found that 158 welds needed inspection. The result of the inspection was that 56 welds need more evaluation.

Inspection Activities: The inspectors reviewed PER 144131 and met with the responsible engineer to verify the adequacy of the applicant's planned and completed corrective actions. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the Welding CAP final closure report and concluded that the scope and effectiveness of the applicant's corrective actions are the same as Unit 1, meet all applicable requirements, and are adequate to address this sub-issue. Therefore no more inspection activities are needed for this sub-issue and it can be closed with the closure of the Welding CAP.

OA.1.6(Discussed) Welding CAP Sub-issue 21: Lack of Penetration / Lack of Fusion (LOP/LOF) in ASME Class 3 Welds (IP 55050 and TI 2512/032)a. Inspection Scope

Background: The Welding CAP was created in the mid 1980's to address several welding-related issues. Sub-issue 21, "Lack of Penetration / Lack of Fusion in ASME Class 3 Welds," was created in 1990 when an NRC radiography inspection for microbiologically induced corrosion (MIC) found LOP and LOF in several welds.

For Unit 1, the applicant radiographed 175 welds. Although all LOP/LOF indications met allowable design stress from ASME Section III, 23 were reworked to restore design margin. To prevent recurrence, a 10% random radiography was instituted. Additionally, the applicant hired a contractor, Aptech Engineering Services, who prepared a report showing 95% confidence that 95% of the affected weld population meet ASME allowable stresses and that this confidence could be extended to Unit 2 by sampling 20 more welds.

For Unit 2, the applicant has chosen 20 welds to be RT'd to achieve 95/95 confidence. The 10% random radiography was decommitted in 1996 and is not being done for new construction.

Inspection Activities:

The inspectors reviewed PER 144183, Aptech Engineering Services' report "The Significance of Lack of Penetration/Lack of Fusion in ASME Class 3 Welds at Watts Bar Nuclear Plant", reviewed corrective action documents, and met with the applicant's responsible engineers to verify the adequacy of corrective actions on Unit 2 to achieve the same confidence as Unit 1. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the Welding CAP final closure report and concluded that the conclusions made by Aptech Engineering Services, combined with the additional radiography that was performed, was adequate to statistically show the same 95%/95% confidence on Unit 2 as was found on Unit 1. This sub-issue needs no more inspection effort and can be closed with the closure of the Welding CAP.

OA.1.7 (Discussed) Mechanical Equipment Qualification (MEQ) Special Program (SP) (IP 50071 and TI 2512/038)

a. Inspection Scope

Background: The MEQ SP was created to meet the requirements of 10 CFR Part 50 Appendix A, General Design Criterion 4.

For Unit 1, the applicant evaluated the non-metallic parts of safety-related equipment in harsh environments and produced a controlled MEQ binder to establish and maintain the qualification status of equipment in the plant.

For Unit 2, the applicant was doing the same as Unit 1.

Inspection Activities: The inspectors met with the applicant's responsible staff to discuss the program and also reviewed Appendix P of procedure SPP-9.2 Rev. 0 to verify the ability of the program to ensure that all applicable equipment is addressed in the MEQ SP. Additional documents reviewed are listed in the Attachment.

b. Observation and Findings

No findings of significance were found.

c. Conclusions

The inspectors concluded that the applicant's program was adequate to ensure that all applicable equipment is entered into the MEQ Program for evaluation. Further inspection is required.

OA.1.8(Discussed) Cable Issues CAP Sub-issue 5: Cable Proximity to Hot Pipes (IP 35007 and TI 2512/016)a. Inspection Scope

Background: This sub-issue for the Cable Issue CAP was developed in response to NRC Information Notice 86-49, which highlighted the potential for cable damage resulting from close proximity to hot pipes.

Inspection Activities: The inspectors completed an evaluation of the status of this CAP Sub-issue: Cable Proximity to Hot Pipes. The applicant's program activities were reviewed to confirm that the program plan addressed related commitments and NRC requirements. The inspectors' review included a determination whether acceptance criteria established by the applicant were based on the Watts Bar G-40 specification and other analyses used to disposition any as-built deviations identified.

The inspectors reviewed a completed calculation EDQ00299920120001 that had been issued to address the concern of installed conduit and their proximity to hot piping with high local ambient temperatures on Unit 2. The inspectors conducted a walk down on Unit 2 to review samples of safety-related deviations to verify that the program adequately analyzed and identified discrepancies of separation criteria between hot pipes and conduits, and properly translated discontinuities into the calculation. The inspectors conducted interviews with the applicant to ensure the walk downs were completed by the applicant and that each deviation was analyzed to determine its acceptability and documented with a required corrective action. The inspectors also reviewed design documentation, including EDCR 59055 and its associated Field Change Requests, to verify that the identified deviations were included in the package and were addressed in attached design drawings. Additional documents reviewed are listed in the Attachment.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that the program has effectively identified discrepancies that did not meet the separation criteria and has adequately identified the cases requiring corrective actions or rework. This item is currently in-process and is in need of further inspection of future completed work.

OA.1.9(Discussed) Cable Issues CAP Sub-Issue: Use of As-Installed Cable Lengths (TI2512/016)a. Inspection Scope

Background: This sub-issue for the Cable Issue CAP was developed to resolve historical concerns with the adequacy of information in the cable routing database. CAP actions had been previously implemented to verify and validate cable routing information in the integrated cable and raceway design system (ICRDS) database; however, the NRC questioned whether as-installed cable lengths were used in engineering calculations.

In a 2011 inspection (IIR 05000391/2011605), inspectors determined that documentation of as-installed values for cable lengths was properly required by procedure and that workers were recording the values for engineering follow up.

Inspection Activities: The inspectors interviewed responsible engineering personnel and reviewed records of completed cable installations performed under WO 09-953531-016 to verify that as-installed cable lengths were recorded and submitted to engineering for entry into ICRDS. The “Installed Cable Length” documented in the Maintenance Activity Instruction (MAI) 3.2 Data Sheet 1, “Cable Installation/Pullback Data Sheet” and MAI 3.3 Data Sheet 3, “Cable Termination Data Sheet” of WO 09-953531-016 was compared to the “Installed Length” recorded in the Integrated Cable and Raceway System (ICRDS) database for cables 2V710A, 2V711A, 2V718A, and 2V719A. This was performed to verify values for as-installed cable lengths were accurately incorporated for future use in engineering analysis and calculations. Additional documents reviewed are listed in the Attachment.

b. Observations and findings

No findings of significance were identified. The review of installed cable lengths recorded in the ICRDS database, that are to be used in cable sizing calculations, was found to be adequately captured from data sheets included in WO packages.

c. Conclusion

Further inspection samples will be required to verify the recorded values for as-installed cable lengths are being accurately documented into the ICRDS database and incorporated into cable sizing calculations.

OA.1.10 (Discussed) Inspection of HVAC Duct and Supports CAP (TI 2512/025, IP 50100)

a. Inspection Scope

Background: The Heating, Ventilating, and Air Conditioning (HVAC) CAP was developed after TVA determined adverse conditions existed involving HVAC duct and duct supports were programmatically characterized as having:

- Incomplete design basis
- Inadequate design documents
- As-built configurations not in conformance with existing design documents
- Inadequate or incomplete inspection documentation and incomplete instructions

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

- Completing the design basis by reviewing and revising the design criteria; issuing supporting calculations and updating the final safety analysis report (FSAR) to be consistent with the upgraded design criteria
- Updating design output documents to be consistent with the completed design basis
- Revising construction, maintenance, and QA procedures to incorporate design output documents
- Developing bounding critical cases of existing installations and evaluating their adequacy, and performing unique evaluations or modifying installations when they could not be qualified by the critical case evaluations

The Unit 2 program uses the Unit 1 approach and also addresses TVA's past corrective action tracking documents.

The NRC letter from P. D. Milano to Mr. Bhatnagar dated February 11, 2009, "Watts Bar Nuclear Plant, Unit 2 – Status of Regulatory Framework for the Completion of Corrective Action and Special Programs and Unresolved Safety Issues," provided the staff's assessment of TVA's approaches for resolving the CAPs and SPs. The staff concluded there was reasonable assurance that, when implemented as described, the HVAC CAP will be appropriately resolved for Unit 2.

Inspection Activities: Previous inspection results, documented in IIR 05000391/2010604 and 05000391/2011608, concluded that walk down packages, updated design calculations, unmodified duct and duct supports were adequate. For this inspection, activities focused on required HVAC modifications due to updated design requirements and previously identified deficiencies. Specifically, the inspectors reviewed closed work orders for HVAC duct and support modifications.

As part of the inspection activities, the inspectors performed field inspections of four closed work orders to verify that the information documented in the work orders matched field conditions. The selected work orders were WO# 111542590, 111542691, 110739497, and 110739327. Work completed under the work orders included HVAC duct and support modifications. All four work orders count as samples towards completion of the HVAC CAP.

The inspectors interviewed the craft performing in-process modifications on HVAC CAP related work orders. Work being performed at the time of the interviews included HVAC duct and support modifications. Based on the interviews with the craft, it was determined that the appropriate personnel were aware and knowledgeable of the installation requirements, material traceability requirements, and the role and responsibility of Field Engineering.

The inspectors reviewed Modification/Addition Instruction (MAI) 4.3 – "HVAC Duct Systems," MAI 5.1C – "Undercut (UC) Concrete Anchors," and General Engineering Specification G-95 – "Installation, Modification and Maintenance of HVAC Duct" to determine if installation instructions and requirements were adequate for the work that was performed. The inspectors also reviewed project procedures 25402-000-GPP-0000N6204 – "Field Material Control and Traceability" and 25402-000-GPP-0000-N1206 – "Work Order Processing" to develop an understanding of controls put in place to maintain material traceability and the work order closure process.

b. Observations and Findings

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

Introduction: A SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," with two examples, was identified for failure to install appropriate Quality Level (QL) material. Specifically, QL 3 rivets were being installed in a QL I/II application.

Description: The inspectors reviewed closed work orders 111542590 and 111542691 for modifications to HVAC duct supports. Both work orders received the necessary QC inspections and engineering reviews required for closure. During the review, the inspectors identified the following:

- As documented in Attachment B – “Material Traceability and Transfer Record,” QL 3 rivets were installed in a load bearing condition in HVAC supports 123-1690 and 123-1787. Per the General Requirements found in MAI 4.3 – “HVAC Duct Systems,” blind rivets shall be “QA Level I or II in load bearing applications.”

The inspectors concluded that the findings were more than minor in accordance with Inspection Manual Chapter (IMC) 2517 because they represented a deviation that if left uncorrected, could adversely affect the environmental or seismic qualification of a SSC. The finding is a SL IV because it does not represent a breakdown in the QA process. The applicant issued Service Request 525290 to address the identified conditions. No cross-cutting aspect was identified.

Enforcement: 10CFR50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, QL 3 rivets were installed in a QL I/II application for supports 123-1690 and 123-1787 as required per MAI 4.3 – “HVAC Duct Systems.” Because this was an SL IV violation and because it was entered into the applicant’s corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. NCV 05000391/2012603-05: Failure to Follow Instructions.

c. Conclusions

The inspected activities associated with NCV 05000391/2012603-05 discussed above were not performed in accordance with applicant procedures and NRC regulations. Additional inspection activities are still required prior to closure of the HVAC CAP.

OA.1.11 (Discussed) Vendor Information CAP (TI 2512/031, IP 50073, IP 51053, IP 52053)

a. Inspection Scope:

Background: The Vendor Information CAP was established to resolve issues identified in TVA Conditions Adverse to Quality Reports, employee concerns, TVA audit findings, and NRC inspection findings, with the use of vendor information at Watts Bar. Specifically, vendor information was not adequately evaluated for implementation, vendor information did not match the plant configuration, vendor information was inconsistent with associated TVA-developed design input/output documents, vendor documents were incorrect or out of date, vendor document control was inadequate, vendor manuals were lost or were uncontrolled, and the incorporation of the Vendor Information Program was not approved by TVA Engineering. To resolve these issues on Unit 2, TVA committed to using the same approach used to resolve the Unit 1 CAP.

Inspection Activities: The inspectors reviewed the applicant’s implementation of the Vendor Information CAP to verify that the problems associated with this CAP have been resolved in accordance with commitments and NRC requirements. The inspectors reviewed vendor document information that included vendor manuals, drawings, analyses and tests to verify that the information met the procedure requirements and were adequately evaluated for implementation. The inspectors selected a sample of eight components, consisting of two electrical, four mechanical, and two instrumentation and control components; and performed a walkdown of each component to verify that

the vendor information on file was applicable and attainable to the installed component in the field. The inspectors also reviewed the vendor revision process, used when an EDCR is processed by engineering, to verify that the vendor packages followed the procedures and were updated accordingly. The inspectors reviewed the Unit 2 steam generators vendor information to verify that the vendor information accurately reflected the Unit 2 steam generators given the differences between the Unit 2 and Unit 1 steam generators.

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions:

Additional inspection activities are still required prior to closure of the Vendor Information CAP; specifically, the inspectors still require the review of TVA's response to Generic Letter 90-03 to verify that the commitments made in the response are present in the current Vendor Information Program procedures, and the inspectors will review the corrective actions from the recent NCV described in section C.1.2.

OA.1.12 (Closed) Construction Deficiency Report (CDR) 391/83-28, Seismic Analysis of North Steam Valve Rooms (IP 35007)

a. Inspection Scope

Background: In May 1983, the applicant notified the NRC that an error had been discovered in the seismic analysis of the north steam valve room (NSVR). Specifically, the natural frequency was not used in generation of the response acceleration spectra as required by design criteria WB-DC-20-24, and changes in the structural configuration and weights of attached masses had invalidated an assumption that torsional affects were insignificant. The applicant originally identified this issue as non-conformance report (NCR) WBN CEB 8301, and later issued PER 172729 to track this item. The NRC identified the item as CDR 390/83-28 and CDR 391/83-28, for Unit 1 and Unit 2 respectively. The NSVR was reanalyzed in CEB-75-23, "Dynamic Earthquake Analysis of the North Steam Valve Room and Response Spectra for Attached Equipment," Rev. 1, which had been corrected to include the correct response spectra. Modifications were required for 14 supports in the Unit 1 NSVR as a result of the reanalysis. The 14 supports were modified under engineering change notice (ECN) 4154, and the applicant submitted their final report for closure on December 1, 1983. Based on interviews, review of supporting documentation, and work observation, inspectors closed CDR 50-390/83-28 for Unit 1 in NRC IR 50-390/84-45.

Inspection Activities: The inspectors performed the following inspection activities for Unit 2:

- Reviewed the applicant's engineering complete open item closure report, including any actions associated with PER 172729, which was issued to track required Unit 2 actions for historical NCR WBN CEB 8301.
- Reviewed ECN 4155, Rev. 5, to verify the number of supports requiring modification due to the re-analysis.
- Reviewed the applicant's revised final report for NCR WBN CEB 8301 for Unit 2, dated April 17, 1986, to verify commitments to address the 155 NSVR supports requiring modification due to the re-analysis.
- Reviewed EDCRs 52457, 52441, and 52430 to verify that they enveloped the

- 155 supports originally requiring modification.
- Reviewed Watts Bar Nuclear Unit 2 Hanger and Analysis Update Program (HAAUP) Corrective Action Program Implementation Plan, to verify incorporation of ECN 4155 and EDCRs 52457, 52441, and 52430.

The applicant is currently implementing their HAAUP CAP, which included a complete pipe stress reanalysis using detailed walkdown information, outstanding design changes, and the appropriate seismic response spectra, in accordance with current design standards and procedures. ECN 4155 represented an outstanding design change that was used as an input for the pipe stress reanalysis. As a result of the reanalysis, EDCRs 52457, 52441, and 52430 were created; actions contained in these EDCRs envelope the 155 supports originally identified by ECN 4155. Additional documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the applicant's engineering complete closure package and determined that the applicant either implemented or initiated appropriate actions to resolve the original construction deficiency. Based on these proposed actions, the item is closed; however, future inspection of completed work is possible at the NRC's discretion.

OA.1.13 (Closed) CDR 391/83-58, Defective Pacific Scientific Company Shock Arrestor Capstan Spring Tang (IP 35007)

a. Inspection Scope

Background: In October 1983, the applicant notified the NRC that they had received Pacific Scientific shock arresters (snubbers) with defective capstan springs. Specifically, the tang on the capstan spring was prone to failure in size PSA-1 and PSA-3 snubbers. This deficiency was originally identified by the applicant in NCR WBN 5127. This deficiency was tracked by the NRC as CDR 390/83-63 for Unit 1 and CDR 391/83-58 for Unit 2. The applicant determined that 161 affected PSA-1 and no PSA-3 snubbers had been received at Watts Bar. The applicant located 155 of the 161 affected snubbers, and replaced or had them reworked by the vendor. The additional 6 snubbers could not be accounted for and were assumed to have been scrapped. The applicant revised procedure WBNP-QCP-4.23-5, "Support Shock Arrestors," with a list of serial numbers for the affected snubbers that could not be located, and a provision to reject those snubbers upon identification. The applicant submitted a final report for the disposition of this deficiency in April 1986. CDR 390/83-63 was closed for Unit 1 in NRC IR 50-390/87-13 and 50-391/87-13.

Inspection Activities: The inspectors performed the following inspection activities for Unit 2:

- Reviewed the applicant's engineering complete open item closure report including any actions associated with PER 172794, which was issued to track required Unit 2 actions for historical NCR WBN 5127.
- Reviewed PER 172794 to ensure incorporation of actions to verify replacement

- of defective capstan springs in PSA-1 and PSA-3 snubbers.
- Reviewed Construction Completion Project Procedure 25402-000-GPP-0000-TI216, "Watts Bar Unit 2 Completion Project Refurbishment Program," Rev. 5 to ensure incorporation of a requirement to refurbish snubbers.
- Reviewed Field Material Requisition (FMR) 25402-000-FMR-PH02-00012 to verify incorporation of a requirement to replace capstan springs in PSA-1 and PSA-3 snubbers during the refurbishment process.

Additional documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors reviewed the applicant's engineering complete closure package, including the refurbishment procedure and material requisition for snubber refurbishment, and determined that the applicant had implemented or initiated appropriate actions to resolve the original construction deficiency. Based on these actions, the item is closed; however, future inspection of completed work is possible at the NRC's discretion.

OA.1.14 (Closed) NUREG-0737 TMI Action Item II.K.3.17, Report on Outage of Emergency Core Cooling System (ECCS) (IP 35007)

a. Inspection Scope

Background: In October 1980, the NRC set forth by letter, all Three Mile Island (TMI) related items approved for implementation by the Commission at that time. The letter was issued as NUREG-0737, "Clarification of TMI Action Plan Requirements." Action item II.K.3.17 required licensees to provide the Commission with a report encompassing all ECCS component outages over the last five years of operation. This report was to detail outage dates and length of outages for all ECCSs including the causes of said outages, in order to provide the staff with a quantification of historical unreliability in order to determine if a need exists for cumulative outage requirements in the technical specifications.

NUREG-0847, "Safety Evaluation Report (SER) Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2," dated June 1982, documents the applicant's commitment to provide this report, a commitment tracked as license condition (30). In a letter dated October 28, 1983, the applicant revised the commitment to comply with this item based upon the staff having received sufficient information from operating facilities to perform its review of the TMI Action Plan item, as well as the applicant's active participation in the nuclear power reliability data system (NPRDS) and compliance with the requirements of 10 CFR 50.73. In Supplement 3 to NUREG-0847, dated January 1985, the staff accepted the applicant's position and declared that no license condition would be imposed upon the Watts Bar facility in this matter, and thus considered license condition (30) closed. In June 1998, the applicant decommitted to the NPRDS participation based upon a March 26, 1997 letter from the Institute of Nuclear Power Operations (INPO) notifying TVA of the distribution of interim Equipment Performance and Information Exchange (EPIX) software (delayed) and the termination of NPRDS reporting.

For the Unit 2 completion project, TVA to NRC Letter dated March 20, 2008, "Watts Bar Nuclear Plant (WBN) – Unit 2 – Generic Communications Status for Unit 2 – Restructured Tables," indicated under the Table 1 entry for NUREG-0737, II.K.3.17, a status of "closed," based upon the supplemental safety evaluation report (SSER) 3 acceptance of TVA's revised commitment. In its response letter, NRC to TVA Letter dated May 28, 2008, "Watts Bar Nuclear Plant, Unit 2 – Status of Generic Communications for Review," Table 1 entry for NUREG-0737, II.K.3.17, the agency also indicated the matter "closed" in its corresponding column. This position is reiterated in the most recent revision to the applicant's framework letter, TVA to NRC Letter dated December 20, 2011, "Watts Bar Nuclear Plant (WBN) Unit 2 – Status of Regulatory Framework for the Completion of Construction and Licensing for Unit 2 – Revision 7, and Status of Generic Communications for Unit 2 – Revision 7."

Inspection Activities: The inspectors reviewed the applicant's final closure package associated with this issue and performed the following additional and independent activities:

- Reviewed all documents referenced in the applicant's final closure package.
- Reviewed procedure NPG-SPP-01.1, "Administration of Standard Programs and Processes (SPPs), Standard Department Procedures (SDPs), and Business Practices (BPs)," Rev. 2.
- Reviewed procedure NPG-SPP-03.3, "NRC Commitment Management," Rev. 1, against the applicant's continuing management of this commitment.
- Reviewed procedure NPG-SPP-02.2, "Performance Indicator Program," Rev. 3.
- Interviewed responsible licensing personnel.

b. Observations and Findings

No findings of significance were identified. In June of 1998, the applicant decommitted to the NPRDS reporting requirement discussed above. This was in response to the Institute of Nuclear Power Operations (INPO) termination of NPRDS reporting to which the applicant was notified in March of 1997. INPO initiated the Equipment Performance Information Exchange (EPIX) reporting system as a replacement to NPRDS, but the applicant made no particular commitment to reporting within that system. Failure data is reported to the NRC for the purpose of tracking the Mitigating System Performance Index (MSPI) which forms part of the regulatory response decisions affecting the site. This reporting is accomplished in accordance with procedure NPG-SPP-02.2, which was provided by the applicant for the inspector's review.

c. Conclusions

Based upon the inspector's review of the applicant's final closure package, it was determined that the applicant continues to meet the intent of the revised commitment accepted by the agency and this item is closed for Unit 2.

OA.1.15 (Closed) NUREG-0737 TMI Action Item II.K.1.5, Review Engineered Safety Feature (ESF) Valves (IP 35007)

a. Inspection Scope

Background: In October 1980, the Nuclear Regulatory Commission set forth by letter, all TMI-related items approved for implementation by the Commission at that time. The letter was issued as NUREG-0737, "Clarification of TMI Action Plan Requirements."

Action item II.K.1.5 required licensees to implement the requirements of Bulletins 79-05, 79-06, and 79-08. Inspection and Enforcement Bulletin (IEB or Bulletin (BL)) 79-06A was directly applicable to Watts Bar as a Westinghouse pressurized water reactor (PWR), and paragraph 8 required all licensees to review all safety-related valve positions, positioning requirements, and positive controls to assure that valves remain positioned in a manner to ensure the proper operation of engineered safety features. Also, licensees were to review related procedures, such as those for maintenance, testing, plant and system startup, and supervisory periodic (e.g., daily/shift checks) surveillance to ensure that such valves are returned to their correct positions following necessary manipulations and are maintained in their proper positions during all operational modes. BL 80-06, "ESF Reset Controls," tied itself to the aforementioned BLs noting that each of the previous communications addressed each ESF by its specific manufacturing type. The agency was requesting reviews undertaken for this particular BL that addressed all ESFs (i.e., BWR and PWR of all manufactures). BL 80-06 required licensees to: 1) review drawings for all systems serving safety-related functions at the schematic level to determine whether or not, upon the reset of an ESF actuation signal, all associated safety-related equipment remains in its emergency mode; 2) verify the actual installed instrumentation and controls at the facility are consistent with the schematics reviewed in Item 1, by conducting a test to demonstrate all equipment remains in its emergency mode upon removal or reset of the actuation signal; and 3) for any equipment which does not remain in its emergency mode, describe the proposed system modification, design change, or other corrective action planned to resolve the problem.

NUREG-0847, "SER Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2," dated June 1982, documents in paragraph 7.3.5 (BL 80-06), the agency's acceptance of TVA's response and proposed modifications to feedwater isolation valves, main feedwater check valve bypass valves, upper tap main feedwater isolation valves, steam generator blowdown isolation valves, and residual heat removal heat exchanger outlet flow control valves subject to review of electrical schematics that were not available at the time. Supplement 3 to NUREG-0847 (SSER 3), dated January 1985, documents in paragraph 7.3.5 (BL 80-06), the agency's review of the schematics for the five valves in question and independent confirmation of their ability to remain in the accident positions after removal or reset of the ESF actuation signal. Supplement 16 to NUREG-0847 (SSER 16), dated September 1995, Appendix EE – Disposition of all Generic Safety Issues Applicable to Watts Bar, Subpart B – NUREG-0737 Issues Not Addressed to Sub-tier Levels, lists for item II.K.1.5 that, "In section 7.3.5 of the SER and SSER 3, the staff found the applicant's response to BLs 79-06A and 80-06 acceptable, but made no explicit reference to II.K.1.5. Since the technical information was found acceptable, even though there was no mention of Item II.K.1.5., the item is closed."

For the Unit 2 completion project, TVA to NRC Letter dated March 20, 2008, "Watts Bar Nuclear Plant (WBN) – Unit 2 – Generic Communications Status for Unit 2 – Restructured Tables," indicated under the Table 1 entries for: B 79-006 a status of "closed," based upon inspection reports 05000390/1980-06 and 05000391/1980-05; B 80-006 a status of "closed," based upon paragraph 7.3.5 of the original SER; and NUREG-0737, II.K.1.5 a status of "closed," based upon SSER 16. In the response letter, NRC to TVA Letter dated May 28, 2008, "Watts Bar Nuclear Plant, Unit 2 – Status of Generic Communications for Review," Table 1 entries for BL 79-06, BL 80-06, and NUREG-0737, II.K.1.5, the agency also indicated the matters "closed" in its corresponding column. This position is reiterated in the most recent revision to the applicant's framework letter, TVA to NRC Letter dated December 20, 2011, "Watts Bar Nuclear Plant Unit 2 – Status of Regulatory Framework for the Completion of Construction and Licensing for Unit 2 – Rev. 7, and Status of Generic Communications

for Unit 2 – Rev. 7.” For BL 80-06, there remains an expectation to perform verifications of proper operation during the preoperational testing yet to be conducted. These matters are being tracked under the agency’s Inspection Planning and Scheduling (IP&S) system separately.

Inspection Activities: The inspectors reviewed the applicant’s final closure package associated with this issue and performed the following additional and independent activities:

- Reviewed all documents referenced in the applicant’s final closure package.
- Reviewed the five valve modifications identified in the applicant’s BL 80-06 response with responsible design engineering personnel against Unit 2 schematics to verify that the appropriate modifications were carried into the Unit 2 design output documents.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based upon the inspector’s review of the applicant’s final closure package, it was determined that the applicant had satisfactorily addressed the TMI action item and its associated BLs; therefore, this item is closed for Unit 2.

OA.1.16 (Closed) URI 391/2010603-06, Material Condition Inside Loop-3 Reactor Coolant System (RCS) Crossover Piping (IP 35007 and 49053)

a. Inspection Scope

Background: On March 20 and 21, 2010, NRC inspectors entered the loop-3 crossover piping, (i.e., RCS intermediate leg), to ascertain its material condition. The inspectors noted that some potential areas of pitting had not been documented by the applicant as specified by WO 110739214. Specifically, Step 5.5.3.C of WO 110739214 stated that:

“After cleaning, the surface of the RCS piping and welds shall be visually examined to determine if surface pitting has occurred. The pipe interior shall be inspected for any area showing a reduction in wall thickness as per NDRF 211911. Any suspect areas shall be forwarded to engineering for inspection and further evaluation.”

In response to the inspectors’ questions about whether the applicant had appropriately addressed areas of potential pitting, the applicant initiated PER 224434, dated April 7, 2010. On June 30, 2010, the inspectors reviewed PER 224434 and noted that corrective action 224434-002 included an engineering disposition unrelated to the issue and instead addressed a 3” drain line. Consequently, the inspectors opened URI 391/2010603-06 to track this issue.

Inspection Activities: Following the initiation of this URI, the applicant performed follow-up visual examinations and remediation of the loop-3 intermediate leg on August 26 and September 10, 2010. Several surface anomalies were noted, including tape residue, a small rust spot, small casting pits, and minor grinding scratches. These were evaluated by the applicant and either remediated or determined to be acceptable. Subsequent chemical swipe tests were performed to verify internal cleanliness. The results of the

visual examinations, remediation, and chemical swipe tests were documented by the applicant and captured by report titled, "Nonconformance Disposition Report for PER 224434. This report, dated February 15, 2012, was attached to PER 224434 along with a series of photographs showing the as-left condition of the loop-3 intermediate leg. The inspectors reviewed this information and noted that PER 224434 had been updated to reflect the actions taken by the applicant to resolve URI 05000391/2010603-06. Additional documents reviewed are listed in the Attachment.

b. Observations and findings

No findings of significance were identified. The inspectors determined that the areas of potential pitting originally described in IIR 2010602 and later by URI 391/20100603-06 were consistent with the definition of "work in progress" delineated by IMC 2517 in that the applicant had not yet performed the final cleaning and inspection of the piping in question. Examinations performed by the applicant on August 26, 2010 and September 10, 2010 properly identified and documented these and other potential problem areas inside the RCS piping in accordance with applicable instructions and procedures. Furthermore, these examinations led to an engineering disposition (Nonconformance Disposition Report for PER 224434) that appropriately addressed the areas of concern originally identified by the URI.

c. Conclusion

The inspectors concluded that the applicant's corrective actions to resolve URI 05000391/2010603-06 were adequate to provide reasonable assurance that the material condition of the loop-3 intermediate leg is acceptable. Therefore, URI 05000391/2010603-06 is now closed.

OA.1.17 (Closed) BL 83-06, Nonconforming Material Supplied by Tube-Line Corporation (IP 92717)

a. Inspection Scope

Background: The BL identified that there were potential generic safety implications at plants which either had received direct shipment of material furnished by Tube-Line Corp. or received piping subassemblies and other components from holders of ASME Certificates of Authorization which incorporated these materials. Licensees were requested to take appropriate actions to confirm the adequacy of affected components for intended service or to submit reports stating that Tube-Line Corp. materials received from the referenced manufacturing locations would not be used in safety-related systems at their facilities. TVA's response to the BL was for both Unit 1 & 2 and was deemed acceptable in IR 50-390(1)/84-03.

TVA's corrective actions for Unit 1 concluded that Tube-Line supplied fittings had been installed on the ERCW system and a use-as-is engineering disposition was provided for these fittings. The NRC approved the use-as-is disposition in SER evaluation, dated September 23, 1991, and was contingent on updates to Unit 1's FSAR to document the alternate acceptance criteria. Final action for TVA was to revise Unit 2's FSAR to document the alternative acceptance criteria.

Inspection Activities: The inspectors reviewed the applicant's final completion closure package and associated reference documents to determine whether BL83-06 actions were completed in accordance with applicant's commitments. The inspectors reviewed

Unit 2's updated FSAR to determine whether the approved alternate acceptance criteria was incorporated as specified by applicant's commitments.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based upon the review of the applicant's final closure package, the inspectors concluded that action items for BL83-06 have been completed and that Unit 2's FSAR was updated with the approved alternate acceptance criteria. Based on the results of this inspection. BL 83-06 is closed for the Unit 2 completion project.

OA.1.18 (Closed) CDR 391/83-66, Target Rock Power Operated Relief Valve (PORV) Opening and Closing Times (IP 35007)

a. Inspection Scope

Background: In December 1983, TVA informed the NRC that installed Target Rock PORVs on Unit 1 were not installed in accordance with manufacturer specifications and therefore the valve delay times were not as calculated. TVA determined the cause of the mispositioned valves was due to "designers failure to recognize the importance of the unusual orientation requirements for the valves as specified on the vendor drawing notes, and then not incorporating these requirements into TVA drawings." In a TVA letter to the NRC, dated January 30, 1985, it was stated "the completion of the work concerning the revision of Unit 2 drawings for the pressurizer PORVs has been rescheduled."

Inspection Activities: The inspectors reviewed the applicant's final completion closure package and associated reference documents to determine whether CDR 391/83-66 corrective actions were completed in accordance with TVA letters to the NRC dated December 7, 1983 and January 30, 1985. The inspectors reviewed EDCR 53756 Rev. A and associated drawing 47W465-7, Rev.22 to determine whether Target Rock specifications had been incorporated into TVA drawings. Additional documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based upon the review of the applicant's final closure package, the inspectors concluded that the Target Rock specifications for PORV positioning were properly incorporated into TVA drawings. CDR 391/83-66 is closed

OA.1.19 (Closed) CDR 391/83-55, Welds on Structural Steel in Valve Rooms (IP 55050 and TI 2512/032)a. Inspection Scope

This item is the same as Welding CAP Sub-Issue 12 and all inspection activities are documented in section OA.1.3 of this report.

b. Observation and Findings

No findings of significance were found.

c. Conclusions

Based upon the review of the applicant's final closure package, the inspectors concluded that the applicant's corrective actions reviewed during this inspection period, as well as inspection activities documented in inspection reports 05000391/2011603, 05000391/2011605, and 05000391/2011607, are adequate to ensure that the structural steel in the North and South Valve Rooms is able to perform its safety function. CDR 391/83-55 is closed.

OA.1.20 (Closed) CDR 391/91-01, Incomplete Penetration/Fusion of Class 3 Piping System Butt Welds (IP 55050 and TI 2512/032)a. Inspection Scope

This item is the same as Welding CAP Sub-Issue 21 and all inspection activities are accordingly documented in section OA.1.6 of this report.

b. Observation and Findings

No findings of significance were found.

c. Conclusions

Based upon the review of the applicant's final actions to address the issue, the inspectors concluded that the conclusions made by Aptech Engineering Services, combined with the additional radiography that was done, is adequate to statistically show the same 95%/95% confidence for ASME Class 3 welds on Unit 2 as was found on Unit 1. CDR 391/91-01 is closed.

OA.1.21 (Closed) CDR 391/91-28, Vendor Supplied Component Nozzle-To-Shell Fillet Welds Found to be Undersized (IP 55050 and TI 2512/032)a. Inspection Scope

This item is the same as Welding CAP Sub-Issue 20 and all inspection activities are accordingly documented in section OA.1.5 of this report.

b. Observation and Findings

No findings of significance were found.

c. Conclusions

Based upon the review of the applicant's final actions taken to address the issue, the inspectors concluded that the scope and effectiveness of the applicant's corrective actions are the same as Unit 1, are in compliance with all applicable requirements, and are adequate to address this sub-issue/CDR. CDR 391/91-28 is closed.

OA.1.22 (Closed) URI 391/87-01-01: Clarification of Issues Concerning Engineering Change Notice (ECN) 4214 (IP 92701)

a. Inspection Scope

Background: A 1987 inspection of Unit 1 questioned the installation of apparently undersized solenoid valves in the control air supply for annulus purge valves 1-FSV-30-54A and 1-FSV-30-62A. The 1/4-inch solenoid valves were not consistent with the original design, which specified 1-inch supply lines. Although an ECN had been issued to approve the smaller valves (ECN 4214), the inspectors determined that engineering had not provided an adequate justification for the change. It was determined that further review was needed to determine whether the valves excessively constricted the air flow to the air operators on the safety-related valves. In addition, the inspectors determined that the licensee's evaluation of the valve actuator for Environmental Qualification compliance was not clear; specifically in regards to use of a nonqualified rubber hose for control air supply and questionable qualification status of Teflon tape.

The applicant's corrective action review (CAQR WBP870322) subsequently discovered that the purge valves had a closing time requirement that the smaller solenoid valves could not support. In a 1994 inspection (390/1994-55), inspectors closed the URI on Unit 1 to a violation of 10 CFR 50 Appendix B, Criterion III for the failure to identify the design input requirement for valve closure time. At that time, the inspectors stated that issues involving Unit 2 would remain on hold and would be evaluated at a future date.

In a 2011 inspection (IIR 05000391/2011605), the inspectors found, through review of corrective actions identified in PER 143837 and EDCRs 54172 and 54923, that six System 30 (Ventilation) solenoid valves were to be replaced with 1-inch ASCO solenoid valves.

Inspection Activities: The inspectors reviewed Unit 1 Valve Test Report PTI-030I-01 to verify the suitability of the 1-inch ASCO solenoid valves to meet the required response time for the designated application. The inspectors reviewed the applicant's engineering complete closure package and specific procurement documents, including Material Requisitions, Purchase Orders, and Material Receiving Instructions, to confirm the 1-inch ASCO solenoid valves were accurately specified, purchased, and satisfactorily received. Additional documents reviewed are listed in the Attachment.

WO 112265364 was reviewed to ensure that the required valve response time would be implemented correctly through the installation of the specified 1-inch ASCO solenoid valves. Field observations were conducted to verify that the completed work activity for WO 112265364 installed 1-inch ASCO solenoid valves for valves WBN-2-FSV- 030-0002-A, -0005-A, -0061-A, and -0062-A. The inspectors noted the model numbers and serial numbers of the installed valves to ensure they matched the specifications of the procurement documents and work order.

b. Observations and findings

No findings of significance were identified.

c. Conclusion

The inspectors determined that the 1-inch ASCO solenoid valves were suitable to meet the required closing response time, were specified in applicable procurement documents, correctly translated into implementing work orders and the inspected sample was adequately installed in the field.

Based upon the review of the applicant's engineering complete closure package and the inspection results of the selected sample, the inspectors concluded that the applicant sufficiently addressed the concerns of ECN 4214 referenced in URI 391/87-01-01. URI 391/87-01-01 is closed.

OA.1.23 (Closed) NCV 05000391/2010603-02, Inadequate Storage and Improper Control of Documents Used in Safety Related Activities (IP 92702)

a. Inspection Scope

Background

The NCV stated that some documents and records in the CONEX modular storage unit had been used to guide the performance of safety-related work activities, and had not been properly protected or controlled. There were no signs in the storage unit, on the filing cabinets, or on the folders themselves to identify the documents as "information only." In addition, the receiving records for a safety-related purchase order were missing from the storage unit with no logout folder in place.

The NCV also identified that TVA failed to provide a complete, accurate, and up-to-date procedure, 25402-ADM-0001, Document Control, Rev. 9 that describes what to do with copies of documents once originals have been transmitted to Document Control and how to control satellite document control facilities. The applicant documented this condition in PER 234281.

Inspection Activities:

The inspectors interviewed responsible personnel and reviewed actions taken to address the NCV. Corrective actions taken by the applicant, including those outlined in PER 234281, were reviewed to determine whether the applicant adequately addressed the issues associated with the NCV. The inspectors performed a walk down in the CONEX storage unit to verify completion of actions to discard all the uncontrolled files and noted the applicant had discontinued use of the CONEX unit as a document storage area. The inspectors interviewed warehouse personnel responsible for final disposition of the receiving copy of the purchase order files, in accordance with procedure 25402-000-GPP-0000-N6104, Materials Receiving. The inspectors also reviewed procedure 25402-ADM-0001, Document Control, to verify that complete, accurate, and up to date guidance was provided for handling of quality-related documents and records. Documents reviewed are listed in the attachment.

b. Observations and findings

No findings of significance were identified.

The inspectors found that procedure 25402-ADM-0001, Document Control, provided requirements for management of temporary storage areas by directing users to NPG-SPP-31.2, Records Management. Also, procedure 25402-000-GPP-0000-N6104, Materials Receiving, provided requirements for control of record copies after the records have been transmitted to the permanent records repository.

c. Conclusion

The inspectors determined that the issues associated with this NCV have been adequately addressed. Therefore, NCV 2010603-02: Inadequate Storage and Improper Control of Documents Used in Safety Related Activities, is closed.

OA.1.24 (Closed) NCV 05000391/2010603-03, Failure to invoke Part 21 in Intergroup Agreement with Central Labs (IP 92702)

a. Inspection Scope

Background

The issue identified in this NCV involved a failure to invoke provisions of 10 CFR Part 21 on a supplier for services of safety-related components. Specifically, lever arms for limit switches purchased under purchase order (PO) 87607 were sent to TVA Central Laboratories to perform commercial grade dedication activities without invoking the provisions of Part 21.

Inspection Activities:

The inspectors interviewed responsible personnel and reviewed records associated with the NCV as documented in PER 235485 and PER 279333 to verify that appropriate actions had been taken to bring the condition into compliance and to prevent recurrence.

The inspector reviewed the revisions to Intergroup Agreement IGA-11 between the applicant and TVA Central Labs to verify appropriate changes were made to the agreement, and to ensure that 10 CFR Part 21 requirements were invoked in accordance with actions specified in PER 235485.

Other completed actions reviewed by the inspectors involved a revision to procedure NPG SPP-04.1, Procurement of Material, Labor & Services, in accordance with PER 279333. The inspectors reviewed this procedure to verify that revisions made to the procurement process addressed a method of invoking QA program requirements on vendors/suppliers.

The inspection scope included a review of PO numbers 256499 and 228991 to verify 10 CFR Part 21 requirements were communicated to TVA Power Service Shop (PSS) and TVA Central Labs (CLS) in accordance with actions in the PERs and the revision to procurement procedure NPG SPP-04.1.

b. Observations and findings

No findings of significance were identified.

The inspectors found that the applicant chose an alternative approach for communicating applicability of Part 21. Instead of establishing Contract Work Authorizations to invoke QA program requirements for TVA CLS and the TVA PSS as

planned in PER 235485, the applicant revised procurement procedures as documented in PER 279333 to specify the alternative process of invoking QA program requirements and awarding work to PSS and CLS in Purchase Orders which contained the necessary technical requirements and T-notes.

c. Conclusion

The inspectors determined that the issues associated with NCV 2010603-03 were adequately addressed and effectively tracked in the applicant's corrective action program. Based on the inspection of these items, NCV 2010603-03, Failure to invoke Part 21 in Intergroup Agreement with Central Labs, is closed.

OA.1.25 (Closed) NOV 86-02-01, Failure to follow procedures resulted in improperly installed solenoid valves/seismic (IP 92702, IP 51053)

a. Inspection Scope

Background: In 1986, NOV 86-02-01 was issued in inspection report 86-02 to identify that ASCO solenoid valves were partially disassembled and reassembled using all thread bolts in place of the original bonnet screws and mounting brackets. The work was performed without any engineering approval, thus calling into question the seismic qualification of the 8316-series solenoid valves installed. The violation also mentioned that the work plan did not have required precautions to adequately control the disassembly of the solenoid valves. The Unit 2 construction completion project responded by establishing plans to replace all safety related ASCO solenoid valves. Inspection Report 05000391/2011605 Section OA.1.9 provided details of the prior inspection activities on this issue.

Inspection Activities: The inspectors reviewed a work order (WO) which installed solenoid valves in the reactor and auxiliary building and walked down three of the ASCO Flow Solenoid Valves (FSVs) listed in the WO that were associated with System 63 (Safety Injection System). For two of the FSVs, 2-FSV-63-84-B and 2-FSV-63-64-A, the inspectors examined the installed valves to verify that the serial numbers and model numbers in the field matched those in the work order, that the FSVs were uniquely identified in the field, and that they were in the right location. The inspectors also inspected the valves to verify that the bolts were snug tight and that the valves were installed in accordance with the vendor manual, associated drawings, and seismic qualifications. For the third FSV, 2-FSV-63-23-B, the inspectors examined the valve to verify that it was uniquely identified and that it was in the right location.

The inspectors reviewed the installation procedure referenced in the WO to verify that it had appropriate instructions for notifying engineering if changes to mounting might be needed.

b. Observations and findings

No findings of significance were identified.

The inspectors noted that the FSVs inspected were only mechanically installed; however, this was sufficient to support an evaluation of the NOV response because the NOV concern was limited to the mechanical aspects of the valve mounting configuration.

c. Conclusion

The inspectors concluded that proper controls for installation of the ASCO solenoid valves had been established in the work order and applicable implementing procedure. The inspectors concluded for the valves that were inspected, they were properly mounted. Based upon the inspection sample, the inspectors concluded that reasonable assurance was provided that nonconforming valve mounts would be removed and that the replacement installations would meet applicable requirements. Therefore, this item is closed.

OA.1.26 (Closed) Construction Deficiency Report (CDR) 391/83-62: Hydrogen Collection Duct Not Qualified as Nozzle Attachment Point (IP 50100)

a. Inspection Scope

In December of 1983, WBN NCR WBN-WBP 8334 identified a deficiency related to the qualification of the hydrogen collection duct system. Specifically, engineering failed to provide adequate analysis for the qualification of the four 8-inch diameter hydrogen collection duct nozzle attachment points to the common suction side duct for the air return fans in lower containment. This was in violation of the TVA Division of Engineering Design Procedure, EN DES-EP, 3.03 – “Design Calculations.” As part of the final disposition, the suction side duct was analyzed to qualify it as a nozzle attachment point for the four 8-inch hydrogen collection ducts. Results of the analysis indicated that a box-type anchor was required for only one of the four 8-inch hydrogen duct nozzle points. Additional analysis was performed to re-qualify the hydrogen collection duct nozzle attachment points and was documented in EDCR 52514 as part of the Unit 2 HAAUP CAP.

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

- Reviewed the applicant’s open item closure report which was issued to track required Unit 2 actions for historical NCR WBN-WBP 8334.
- Performed field verification of Support No. 47A060-30-2 to ensure field conditions matched those used in the qualification calculations.
- Reviewed “Summary of Piping Analysis Problem No. N3-30-04R” for the qualification of the updated nozzle loads.
- Reviewed “Calculations for Pipe Support No. 47A060-30-2,” Rev. 003, to verify that updated loads were properly transferred into the design calculations and that the results were adequate.
- Reviewed EDCR 52515, Rev. B to ensure that engineering and construction issues identified for the qualification of the Hydrogen Collection Duct Nozzle Attachment Point were adequately addressed.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based on these actions, the inspectors determined that the applicant resolved the original construction deficiency for Unit 2. This item is closed for Unit 2.

V. MANAGEMENT MEETINGS

X.1 Exit Meeting Summary

On April 16, 2012, the resident inspectors presented the inspection results to Mr. Hruby and other members of his staff. Although some proprietary information may have been reviewed during the inspection, no proprietary information was included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

A. Bangalore, Electrical Engineer, Bechtel
D. Beckley, Electrical Design, TVA, Unit 2
J. Boykin, Quality Control, TVA
D. Charlton, Licensing, TVA, Unit 2
W. Crouch, Engineer, TVA
R. Enis, Mechanical Engineer, TVA, Unit 2
A. Hart, Construction Supervisor, Bechtel
D. Helms, Engineer, TVA, Unit 2
R. Johnson, Site Support Manager, TVA, Unit 2
I. Khan, Electrical Engineer, Washington Group
J. Martin, Quality Manager, Bechtel
P. Olson, Start-up Manager, TVA, Unit 2
J. Robertson, Engineering Manager, Bechtel
G. Scott, Licensing, TVA, Unit 2
R. Hruby, General Manager, TVA, Unit 2
I. Zeringue, General Manager, TVA, Unit 2
R. Wigall, Engineering Manager, TVA, Unit 2

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction
IP 35742	QA Program (Document Control)
IP 35750	QA Program Measuring and Test Equipment
IP 37002	Construction Refurbishment Process – Watts Bar Unit 2
IP 49053	Reactor Coolant Pressure Boundary Piping – Work Observation
IP 49063	Piping – Work Observation
IP 50071	Safety-Related Components – Procedure Review
IP 50073	Mechanical Components – Work Observation
IP 50100	Heating, Ventilating, and Air Conditioning Systems
IP 51053	Electrical Components and Systems – Work Observation
IP 52053	Instrument Components and Systems – Work Observation
IP 55050	Nuclear Welding General Inspection Procedure
IP 55100	Structural Welding General Procedure
IP 64051	Procedures – Fire Protection/Prevention
IP 70300	Preoperational Test Procedure Test Review
IP 92701	Follow-up
IP 92702	Follow-up on Corrective Actions for Violations and Deviations
IP 92717	IE Bulletins for Information and IE Information Notice Follow-up
TI 2512/016	Inspection of Watts Bar Nuclear Plant Cable Issues CAP Plan
TI 2512/025	Inspection of Watts Bar Nuclear Plant HVAC Duct and Supports CAP Plan
TI 2512/031	Inspection of Watts Bar Nuclear Plant Vendor Information CAP Plan
TI 2512/032	Inspection of Watts Bar Nuclear Plant Welding CAP Plan
TI 2512/038	Inspection of Watts Bar Nuclear Plant MEQ SP

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000391/2012603-01	NCV	Failure to Implement Cable Determination Activities In Accordance With Prescribed Work Instructions Affecting Operating Unit. (Section C.1.1)
05000391/2012603-02	NCV	Failure to Translate Stow Remote Valve Operator Design Requirements to Refurbishment Procedures. (Section C.1.2)
05000391/2012603-04	NCV	Failure to Maintain Weld Radiographs. (OA.1.4)
05000391/2012603-05	NCV	Failure to Follow Instructions. (OA.1.10)

Opened

05000391/2012603-03	URI	Use of less conservative later editions of the AWS code of record to disposition welding non-conformances. (OA.1.4)
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Discussed

2512/032	TI	<p>Welding CAP Sub-Issue 10: Independent Weld Deviation Reports (Section OA.1.1)</p> <p>Welding CAP Sub-Issue 11: Main Steam Impingement Sleeve (Section OA.1.2)</p> <p>Welding CAP Sub-Issue 12: North/South Valve Rooms (Section OA.1.3)</p> <p>Welding CAP Sub-Issue 17: Welds on Vendor Supplied Equipment (Section OA.1.4)</p> <p>Welding CAP Sub-Issue 20: Undersize Nozzle Welds on ASME Components (Section OA.1.5)</p> <p>Welding CAP Sub-Issue 21: Lack of Penetration/Lack of Fusion in ASME Class 3 Welds (Section OA.1.6)</p>
2512/038	TI	MEQ SP (Section OA.1.7)
2512/016	TI	Cable Issues CAP Sub-Issue 5: Cable Proximity to Hot Pipes (Section OA.1.8)
2512/016	TI	Cable Issues CAP Sub-Issue: Use of As-Installed Cable Lengths(Section OA.1.9)

2512/025	TI	Inspection of HVAC Duct and Supports CAP (Section OA.1.10)
2512/031	TI	Vendor Information CAP (Section OA.1.11)
<u>Closed</u>		
391/83-28	CDR	Seismic Analysis of North Steam Valve Rooms (Section OA.1.12)
391/83-58	CDR	Defective Pacific Scientific Company Shock Arrestor Capstan Spring Tang (Section OA.1.13)
II.K.3.17	TMI Action	Report on Outage of ECCS (Section OA.1.14)
II.K.1.5	TMI Action	Review ESF Valves (Section OA.1.15)
05000391/2010603-06	URI	Material Condition Inside Loop-3 RCS Crossover Piping (Section OA.1.16)
83-06	BL	Nonconforming Material Supplied by Tube-Line Corporation (Section OA.1.17)
391/83-66	CDR	Target Rock PORV Opening and Closing Times (Section OA.1.18)
391/83-55	CDR	Welds on Structural Steel in Valve Rooms (Section OA.1.19)
391/91-01	CDR	Incomplete Penetration/Fusion of Class 3 Piping System Butt Welds (Section OA.1.20)
391/91-28	CDR	Vendor Supplied Component Nozzle-To-Shell Fillet Welds Found to be Undersized (Section OA.1.21)
391/87-01-01	URI	Clarification of Issues Concerning ECN 4214 (Section OA.1.22)
05000391/2010603-02	NCV	Inadequate Storage and Improper Control of Documents Used in Safety-Related Activities (Section OA.1.23)
05000391/2010603-03	NCV	Failure to Invoke Part 21 in Intergroup Agreement with Central Labs (Section OA.1.24)

86-02-01	NOV	Failure to Follow Procedures Resulted in Improperly Installed Solenoid Valves/Seismic (Section OA.1.25)
391/83-62	CDR	Hydrogen Collection Duct Not Qualified as Nozzle Attachment Point (Section OA.1.26)

LIST OF DOCUMENTS REVIEWED

I. QUALITY ASSURANCE (QA) PROGRAM

Q.1.3 Document Control (IP 35742B)

Audit Reviews Performed for Document Control

TVA Quality Assurance Nuclear Power Group (NPG) Maintenance Audit Report SSA1005 , R.0, 7/02/2010
 Bechtel Construction Operations, ASME Section III Division 1 Bechtel Quality Assurance Manual Implementation Audit No. 25402-WBN-AR-11-0005, R.0, 10/19/2011
 Bechtel Watts Bar Nuclear 2 Construction Completion Project (WB2CCP) Audit Report Work Order Closure and Field material Control Audit 25402-WBN-AR-10-003, R.0, 8/03/2010

List of Document Control PER's Reviewed for Corrective Actions

PER 235988, Line Verification Independence Challenges, 6/23/2010
 PER 236537, Inadequate Implementation of Maint. Planner Training per TRN-18, 6/25/2010
 PER 234977, Supplemental Supervisor Training, 6/17/2010

EDCR Packages Reviewed for Document Control

EDCR 53226 (EDCR adds a seal-in feature to each of the Motor Driven Auxiliary Feedwater Pump (2A-A and 2B-B) start circuits)
 EDCR 57376 (EDCR removes and replaces control devices and sense lines and replaces them with new components to eliminate waterhammer events in the SGV Blowdown (SGBD) system HE)

Q.1.4 Measuring and Test Equipment (IP 35750)

TVA-NQA-PLN89-A, Nuclear Quality Assurance Plan, R.25, dated 9/30/2011
 NPG-SPP-06.4 R.0000, "Measuring and Test Equipment", R.0000, dated 8/06/2010

List of Equipment Stored in the Calibration Lab that was Selected for M & TE Inspection

E45301 Fluke Digital Multimeter	Calibrated 10/13/11 to 5/30/12 Limited Certification
E45756 Barometer Calibrated	Calibrated 11/30/11 to 5/30/12
E46655 Dial Caliper	Limited Certification
E36447 Uninsulated Crimper	Functional Gauge go/no go test tested by gauge
E43632 Ultrasonic Flowmeter	Calibrated 11/16/11 to 5/16/12
E46878 Analog Pressure Gauge	Calibrated 11/18/11 to 5/18/12
E46459 Digital Megger	Calibrated 11/03/11 to 11/03/12
E46431 Outside Caliper	Calibrated 12/06/11 to 12/06/12
E46807 Torque Screwdriver	Calibrated 10/19/2011 to 11/19 12
E35358 Torque Wrench	Calibrated 9/18/11 to 9/18/12
E804651 Doble Tester	Calibrated 2/21/12 to 2/21/13

List of M & TE PER's Reviewed for Corrective Actions

PER 334744, M & TE Gauge Found out of Calibration Upon Post Test Check,
3/05/2011
 PER 390604, M & TE out of Calibration (Hydraulic Torque Wrench), 6/20/2011
 PER 404929, Issued Digital Thermometer (E45298) Issued and not Returned,
7/20/2011
 PER 369728, Craft Working and the Tool Room Closed, 5/13/2011
 PER 352555, Incorrect M & TE Gauge Action Range 4/02/11

II. MANAGEMENT OVERSIGHT AND CONTROLS**C.1.2 Mechanical Components – Work Observation and Construction Refurbishment Process**

WBN-VD-S425-2844, Stow Manual Remote Control Equipment for Valves for Atomic Power Applications Operations and Maintenance Instructions, Revision 1
 PER 107084, Reach Rod Valve Failures System 062, 7/19/2006

C.1.3 Piping – Work Observation

WO 111234754, CCH Sys 070 WBN-2-PIPE-070-C Pressure Test 2-070-HYDRO-B5-3

C.1.4 Procedures – Fire Prevention/Protection

WO 112565354, Portable Fire Extinguisher Inspections Construction Areas 0781V as listed in 0073F
 0-FPS-510-EXT/INSP, Portable Fire Extinguishers Inspection (Annual, Construction Areas), Rev. 0

C.1.5 Nuclear Welding GeneralField Weld Checklist (WR-5)

Weld Numbers: 2-001A-D009-30 C0R0; 2-001A-D006-09 C0R1; 2-001A-D006-09 C0R2; 2-003A-T101-12 C0R0; 2-001A-D006-16 C0R0

Bechtel Welding Procedure Specification

P1-A-Lh (CVN+10) revision 0
 P1-AT-Lh (CVN+10) revision 1
 P1-T (CVN+10) revision 1

Bechtel Procedure Qualification Record

1242
 1351

Certified Material Test Report

ESAB CMTR for ER70S-6 3/32-inch, Heat No. 386272, TVA P.O. 239316
 ESAB CMTR for ER70S-6 1/8-inch, Heat No. 386272, TVA P.O. 239316
 ESAB CMTR for E7018H4R 3/32-inch, Heat No. A900317, Lot No. 2D020D05, TVA P.O. 134577
 ESAB CMTR for E7018H4R 3/32-inch, Heat No. M902234, Lot No. 2H012D04, TVA P.O. 172480
 ESAB CMTR for E7018H4R 3/32-inch, Heat No. 083295, Lot No. 2E927C03, TVA P.O. 19398

Drawings

FSK-M-1216 revision 2
 FSK-M-1339 revision 0
 FSK-M-1413 revision 0
 FSK-M-3936 revision 2

Miscellaneous

Bechtel WR-31 for weld numbers: 2-003A-T101-12; 2-001A-D009-30; 2-001A-D006-16; 2-001A-D006-09 C0R1; 2-001A-D006-09 C0R2

C.1.6 Electrical Components and systems – Work ObservationProblem Evaluation Report (PER)

PER 431164 Review of WO closure process

IV. OTHER ACTIVITIES**OA.1.1 Welding CAP Sub-issue 10: Independent Weld Deviation Reports**

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

Calculation WCG-1-315 Rev. 2

Corrective Action Documents

IDR 999-0024
 IDR 999-0074
 IDR 999-0126
 IDR 999-0226
 IDR 999-0256
 IDR WTG-0024
 IDR WTG-0067
 IDR WTG-0109

OA.1.2 Welding CAP Sub-issue 11: Main Steam Impingement Sleeve

Corrective Action Documents (PERs)

144160
 408391

Drawings

47W2612-2 Rev. 1
 47W2612-1 Rev. 2

EDCR 58676 Rev. A

Calculation WCG2913 Rev. 0

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

OA.1.3 Welding CAP Sub-issue 12: North / South Valve Rooms

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

Calculation WCG1616 Rev. 7

FCR 57693-A

Corrective Action Documents (PERs)

393639

346359

144146

Drawings

48W1707-16 Rev. 11

48W1707-15 Rev. 11

48W1707-13 Rev. 11

48W1707-04 Rev. 8

OA.1.4 Welding CAP Sub-issue 17: Welds on Vendor Supplied Equipment

Corrective Action Documents

CAQR WBP880749

CAQR WBP880750

SR 516348

SR 518241

PER 144061

PER 170933

Calculation WBPMTB002 Rev. 2

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

OA.1.5 Welding CAP Sub-issue 20: Undersize Nozzle Welds in ASME Components

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

PER 144131

OA.1.6 Welding CAP Sub-issue 21: Lack of Penetration / Lack of Fusion in ASME Class 3 Welds

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

Aptech Engineering Services' report "The Significance of Lack of Penetration/Lack of Fusion in ASME Class 3 Welds at Watts Bar Nuclear Plant", February 27, 1991

Corrective Action Documents

SCAR WBP910029SCA Rev. 0

CAQR WBP910029 Rev. 0

PER 144183

OA.1.7 Mechanical Equipment Qualification SP

Watts Bar Nuclear Plant, Unit 2, Welding Corrective Action Program Closure Report, RIMS number: T03 120222 002

Procedure NPG-SPP-09.2 Rev. 0 Appendix P

OA.1.8 Cable Issues CAP Sub-issue 5: Cable Proximity to Hot PipesEngineering Documents

EDCR 59055, Hot Pipe Program has identified Safety and Non-Safety conduits, 2/6/12
EDQ00299920120001, Rev 000, Unit 2 Hot Pipe Evaluation and Disposition, 2/2/12

Other

Cable Proximity to Hot Pipes (CP1.5), Closure Report, Rev. 000, 2/16/12

OA.1.9 Electrical CAP Sub-Issue: Use of As-Installed Cable LengthsService Request (SR)

SR 514638, (NRC Identified) WBN2 Cable Length Discrepancy

Work Orders

WO 09-953531-016, EDCR-2 #53554, System 067, Install and Terminate Cables
2V710A, 2V711A, 2V718A, 2V7190A

OA.1.10 Inspection of HVAC Duct and Supports CAPProcedures, Standards and Specifications

MAI-4.3, HVAC Duct Systems, Rev. 9

MAI-5.1C, Undercut (UC) Concrete Anchors, Rev. 14

25402-000-GPP-0000-N6204, Field Material Control and Traceability, Rev. 15

25402-000-GPP-0000-N1206, Work Order Processing, Rev. 14

G-95, Installation, Modification and Maintenance of HVAC Duct, Rev. 0, SRN 7

Closed Work Orders

WO#111542590

WO#111542691

WO#110739327

WO#110739497

WO#110800695

WO#110951743

WO#111637288

WO#110739734

WO#110739537

WO#110739415

Problem Evaluation Reports

PER 524352 – QC Inspector Involvement

PER 527134 – Concerns with HVAC Work Orders

PER 524269 – QA Oversight of Work Order 110739327 HVAC Ductwork Flex Connectors

Engineering Calculations

ECN 4582, 3/28/1984

NCR WBN WBP 8334, Rev. 1

Summary of piping Analysis Problem # N3-30-04R, Rev 5

Calculations for Pipe Support No. 47A060-30-2, Rev 3

EDCR 52514, Rev. B
 Drawing Number: 47A060-30-2, Rev 0

OA.1.12 CDR 391/83-28, Seismic Analysis of North Steam Valve Rooms

PERs and NCRs

NCR WBN CEB 8301, incorrect Dynamic Earthquake Analysis of North Steam Valve Room, dated 12/24/1985
 PER 172729, NCO860149001-155 supports in Unit 2 North Steam Valve Room require modifications per ECN 4155, status date 03/14/2011

Design Criteria Documents

WB-DC-20-24, Dynamic Earthquake Analysis of Category I Structures and Earth Embankments, Rev. 9, dated 02/23/2010

EDCRs

EDCR 52430, Modification of Pipe Supports on Main Feedwater System (003), Rev. A, dated 05/25/2010
 EDCR 52441, Modification of Pipe Supports on Main and Auxiliary Feedwater (System 003), Rev. A, 10/14/2009
 EDCR 52457, Pipe Support Modification on LOOPS 1,2,3 &4 Main Steam Lines from Steam Generator to Steam Valve Vault Anchors, Rev. A, dated 09/03/2009

Miscellaneous

ECN 4155, Seismic Reanalysis and Support Redesign Required due to Incorrect Response Spectra Used for North Steam Valve Room: NCR WBN CEB 8301, Rev. 5, dated 04/29/1985
 CEB-75-23, Dynamic Earthquake Analysis of the North Steam Valve Room and Response Spectra for Attached Equipment, Rev. 4, dated 02/19/2008
 Implementation Plan, Hanger Analysis and Update Program, dated 02/09/2010
 Revised Final Report, Seismic Analysis of the North Steam Valve Rooms – WBRD-50-390/83-28, WBRD-50-391/83-28, dated 04/17/1986

OA.1.13 CDR 391/83-58, Defective Pacific Scientific Company Shock Arrestor Capstan Spring Tang

PERs and NRCs

PER 172794, TROI ITEM (50.55e) WBN-5127, status date 03/01/2012
 NCR WBN 5127, Defective Pacific Scientific Company Shock Arrestor Capstan Spring Tang, dated 02.02/1984

Procedures

Construction Completion Project Procedure 25402-000-GPP-0000-TI216, Watts Bar Unit 2 Completion Project Refurbishment Program, Rev. 7, 01/25/2012

Miscellaneous

Engineering Complete Open Items Completion Report for CDR 391/83-58, dated 01/25/2012
 Field Material Requisition (FMR) 25402-000-FMR-PH02-00012, Snubber Refurbishment, 04/29/2010
 TVA's Final Report for Watts Bar Unit1 and 2 for NCR WBN 5127, dated 11/10/1983

TVA's Supplemental Final Report for Watts Bar Unit1 and 2 for NCR WBN 5127, dated 04/08/1986

OA.1.15 NUREG-0737 TMI Action Item II.K.1.5, Review Engineered Safety Feature (ESF) Valves

2-45W600-43-1, Wiring Diagrams Sampling and Water Quality System Schematic Diagrams, Rev. 2.
 2-45W600-57-8, Wiring Diagram Separation and Miscellaneous Aux Relays Schematic Diagrams, Rev. 2.
 2-45W600-74, Wiring Diagrams Residual Heat Removal System Schematic Diagram, Rev. 0.
 DRA 52378-140, Affecting drawing 2-45W600-74, Rev. 0
 DRA 52639-001, Affecting drawing 2-45W600-74, Rev. 0
 DRA 52639-100, Affecting drawing 2-45W600-74, Rev. 0
 DRA 52671-089, Affecting drawing 2-45W600-74, Rev. 0
 2-45W600-3-11, Wiring Diagrams Main and Auxiliary Feedwater System Schematic Diagram, Rev. 0
 DRA 58285-016, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 58285-017, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-026, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-033, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-038, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-039, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-040, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-041, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-042, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-043, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-200, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-201, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-202, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-203, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-204, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-205, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-206, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-207, Affecting drawing 2-45W600-3-11, Rev. 0
 DRA 54144-208, Affecting drawing 2-45W600-3-11, Rev. 0
 2-45W760-3-6, Wiring Diagram Main and Auxiliary Feedwater System Schematic Diagrams, Rev. 0
 DRA 53217-241, Affecting drawing 2-45W760-3-6, Rev. 0
 DRA 53217-242, Affecting drawing 2-45W760-3-6, Rev. 0
 DRA 53288-047, Affecting drawing 2-45W760-3-6, Rev. 0
 DRA 53293-012, Affecting drawing 2-45W760-3-6, Rev. 0
 DRA 54144-028, Affecting drawing 2-45W760-3-6, Rev. 0
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172663

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LIST OF ACRONYMS

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
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 labs
ECP	Employee Concerns Program
EDCR	Engineering Document Construction Release
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)
LOP/LOF	lack of penetration/lack of fusion
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
PM	preventative maintenance
PO	purchase order
PORV	power operated relief valve
PQR	procedure qualification record
PSS	power service shop
PWR	pressurized water reactor
QA	quality assurance
QC	quality control
RCS	reactor coolant system
REV.	revision
RT	radiographic test
SER	Safety Evaluation Report
SL	severity level
SP	Special Program
SSC	systems, structures, and components
TI	Temporary Instruction
TVA	Tennessee Valley Authority
URI	Unresolved Item
UT	ultrasonic test
VLF	very low frequency

VT
WBN
WO

visual test
Watts Bar Nuclear Plant
work order