



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

December 20, 2012

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

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED  
INSPECTION REPORT 05000391/2012609**

Dear Mr. Skaggs:

On November 17, 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 November 30, 2012, with Mr. Hruby, General Manager, 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 one NRC-identified finding which was determined to involve a violation of NRC requirements. However, because the finding was a Severity Level IV violation and was entered into your Corrective Action Program, the NRC is treating this as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the NCV 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).

TVA

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

Sincerely,

**/RA/**

Eric Michel, Acting Chief  
Construction Projects Branch 3  
Division of Construction Projects

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

Enclosure: Inspection Report 05000391/2012609 w/Attachment

cc w/encl: (See next page)

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

Sincerely,

**/RA/**

Eric Michel, Acting Chief  
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 Division of Construction Projects

Docket No. 50-391  
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cc w/encl: (See next page)

\* Previous Concurrence

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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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TVA

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Letter to Michael D. Skaggs from Eric Michel dated December 20, 2012.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED  
INSPECTION REPORT 05000391/2012609

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2012609

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: Spring City, TN 37381

Dates: October 1 – November 17, 2012

Inspectors: T. Nazario, Senior Resident Inspector, Construction Projects  
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Region II (RII)  
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Approved by: Eric Michel, Acting Chief  
Construction Projects Branch 3  
Division of Construction Projects

Enclosure

## EXECUTIVE SUMMARY

### Watts Bar Nuclear Plant, Unit 2

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

### Inspection Results

- The NRC identified a Severity Level (SL) IV non-cited violation (NCV) of 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion XVII, "Quality Assurance Records," for the failure to sufficiently record and furnish evidence of activities affecting quality. Specifically, quality records for a field change request (FCR), drawing revision authorization (DRA), and engineering document construction release (EDCR) were closed and authenticated as correctly documenting the installation of wiring for the safety injection accumulator tank nitrogen valve position control indications. However, a field walkdown of the completed configuration by the inspectors identified a jumper wire was not installed on terminal A1-47 from point 3 to 7 as certified by EDCR 52363-A and DRA 52363-14. (Section E.1.1)
- The inspectors concluded that five open items, including two Temporary Instructions (TIs) and three Construction Deficiency Reports (CDR) 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; Temporary Instructions (TIs); NRC inspection procedures (IPs); CDRs; and refurbishment.



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## REPORT DETAILS

### Summary of Plant Status

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

### I. QUALITY ASSURANCE PROGRAM

#### Q.1 Quality Assurance Oversight Activities

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

###### a. Inspection Scope

The inspectors continued to review problem evaluation reports (PERs), as part of the applicant's corrective action program, to verify that issues being identified under the corrective action program were being properly identified, addressed, and resolved by the applicant.

During this inspection period, the inspectors observed a training session on safety conscious work environment and 10 *Code of Federal Regulations* (CFR) 50.9 to determine whether the training met regulatory requirements of Confirmatory Order 2012-0171, issued for enforcement action EA-12-021 (ML 12173A020). The training addressed actions to prevent recurrence outlined in Confirmatory Order 2012-0171, Section 3.d. Specifically, TVA would provide 10 CFR 50.9 training (both manager/supervisor as well as craft-level) to employees, including contractor and subcontractor employees, at all Nuclear Construction (Watts Bar Unit 2 and Bellefonte) locations by December 21, 2012. The training consisted of multiple sessions provided to supervisors and non-supervisory personnel at the site. The observed training was part of the corrective action plan for PER 533342 which addressed the confirmatory order.

###### b. Observations and Findings

No findings were identified.

###### c. Conclusions

The observed training satisfied the requirements in Confirmatory Order 2012-0171, Section 3.d, and the corrective actions in PER 533342 for this training.

## 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 activities observed included work associated with:

- Work order (WO) 112833358, Essential Raw Cooling Water (ERCW) Leak Observed Downstream of 1-FCV-67-146, 10/15/2012
- WO 111117679, Remove and Reinstall Check Valve 2-CKV-062-0928, 10/02/2012
- WO 113595125, Remove and Reinstall Check Valve 2-CKV-062-0928, 11/07/2012
- WO 113866338, Conduit 2VC9697A from system 292 Auxiliary Building Conduit & Cable Tray System, 09/12/2012
- WO 113280423, Conduit 2CR4683A from system 292 Auxiliary Building Conduit & Cable Tray System, 10/05/2012

##### b. Observations and Findings

No findings were identified.

##### c. Conclusions

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

### **C.1.2 Mechanical Components – Work Observation and Construction Refurbishment Process (Inspection Procedures 50073 and 37002)**

#### a. Inspection Scope

The inspectors observed repairs to the cladding in the bowls and hot leg portions of steam generators 1 and 4 to verify welding was in accordance with procedures and ASME B&PV Code 2007 edition. The inspectors reviewed welding procedure specifications and supporting procedure qualification records to determine whether the qualified procedures met the requirements of ASME B&PV Code 2007 edition.

The inspectors reviewed Westinghouse design specification 425A55, Rev.2, to determine whether the specification met regulatory commitments. The inspectors reviewed pre-heat and post-weld soak procedures to determine whether the requirements of ASME B&PV Code 2007 edition were met.

Documents reviewed are listed in the attachment.

#### b. Observations and Findings

No findings were identified.

#### c. Conclusions

The observed refurbishment activities on steam generators 1 and 4 were conducted in accordance with procedures and ASME B&PV Code 2007 edition. The documents reviewed as a result of the inspection were in compliance with the requirements of ASME B&PV Code 2007 edition.

### **C.1.3 Nondestructive Examination Procedure Radiographic Examination Procedure Review/Work Observation/Record Review (Inspection Procedure 57090 and 37002)**

#### a. Inspection Scope

The inspectors observed radiographic examination (RT) of refueling water storage tank (RWST) welds 2-063B-T288-1H10 and 2-063Y-PDMT-0F-1 to determine whether procedure and American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code 1971 edition 1973 addenda requirements were met. Specifically, the inspectors reviewed the material to be radiographed, material thickness, radiation source, film brand, minimum source to film distance, exposure conditions, film density limits, radiograph identification, location markers, geometrical unsharpness limits, penetrameter selection, and radiographic technique to determine whether procedure and ASME requirements were met.

The inspectors observed RT of the RWST to determine whether applicable work instructions clearly specified the examination procedure to be used and that a copy of the procedure was available in the area during examination. Radiographic examination of the RWST was also observed to determine whether the specific areas to be examined were clearly defined and the required equipment and materials were available at the work location.

The inspectors observed processing of radiographic film to determine whether the film was being processed in accordance with procedure requirements and that the film was free of chemical and mechanical blemishes.

The inspectors reviewed radiographic personnel certifications to determine whether the personnel performing RT met procedure and American Society for Nondestructive Testing SNT-TC-1A requirements.

The following samples were inspected:

- IP 57090 Section 02.02 – two samples

Documents reviewed are listed in the attachment.

b. Observations

No findings were identified.

c. Conclusions

The observed radiographic examination of RWST welds met procedure and applicable ASME B&PV Code 1971 edition thru 1973 addenda requirements. The processing of the radiographic film was conducted in accordance with procedure requirements. The radiographic personnel were certified in accordance with procedure and SNT-TC-1A requirements.

#### **C.1.4 Piping – Work Observation (Inspection Procedure 49063 and 37002)**

a. Inspection Scope

The inspectors observed installation of pipe spools and fittings in the ERCW system, turbine driven auxiliary feedwater system, and chemical & volume control system to determine whether procedure and ASME B&PV Code 1971 edition thru 1973 addenda requirements were met. The inspectors observed cleanliness control, grinding, supporting, and quality-related inspections for the piping and fittings installed in the systems discussed above to determine whether procedures and specifications were followed. The inspectors reviewed material identification and records related to the piping and fitting installations to determine whether procedure requirements were met.

The following samples were inspected:

- IP 49063 Section 02.01 – 2 samples
- IP 49063 Section 02.02 – 2 samples

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The observed pipe spool and fitting installations activities were conducted in accordance with procedures, specifications, and ASME B&PV Code 1971 edition thru 1973 addenda. The cleanliness control, grinding, supporting, and quality-related inspections observed by the inspectors were conducted in accordance with procedures and specifications.

**C.1.5 Reactor Vessel and Internals Construction Refurbishment Process (Inspection Procedure 50053)**

a. Inspection Scope

The inspectors performed inspection activities associated with the reactor vessel stud hole remediation plan and trial fit to support Westinghouse analysis, performed under WO 112388257. The inspectors observed the trial fit of the reactor vessel studs into the reactor vessel and observed the applicant's oversight of the work activities to determine if the work was completed in accordance with the work instructions, if foreign material exclusion control measures were implemented, and if the applicant provided adequate oversight for the work activity.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The reactor vessel stud trial fit activities were performed in accordance with applicable procedures.

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

a. Inspection Scope

The inspectors observed in-process and completed installation of safety-related raceway components to verify they were in accordance with specification and drawing requirements in the WO package. The inspectors reviewed associated work orders to verify that components were installed in accordance with the latest approved revision of construction drawings, specifications, and procedures. The inspectors reviewed the size and type of installed raceway systems to verify that the drawings and the Integrated Cable and Raceway Design System reports matched the installed components. As part of the installation review, the inspectors reviewed drawings to verify that components were installed in the location shown on the drawings, and that supports and mounting hardware were installed and spaced in accordance with the G-40 specification. The inspectors reviewed the installation to verify that component identification tags and train labeling were in accordance with the G-40 specification. The inspectors examined specification requirements of pull fittings to verify that the pull fittings used were applied at intervals to maintain adequate total bend radius in accordance with the G-40 specification. The inspectors reviewed the installation to verify that conduits and junction

boxes maintained specified physical and electrical separation and independence between redundant components. The inspectors reviewed the documentation of quality control inspections of the completed work package to verify the quality control inspection reviewed the appropriate installation aspects of the raceway components.

Additional documents reviewed are listed in the attachment.

The following samples were inspected:

- IP 51053 Section 02.02.d - 3 samples
- IP 51053 Section 02.02.e - 4 samples

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors concluded that the conduit installation met specification and drawing requirements.

## **E.1 Engineering Activities**

### **E.1.1 Onsite Design Activities (Inspection Procedure 37055)**

a. Inspection Scope

The inspectors evaluated the adequacy of design controls as implemented by the applicant's contractor for engineering, procurement, and construction (EPC) at the Watts Bar Unit 2 construction completion project. The inspection scope included reviews of documentation for completed field change requests (FCRs), including advance approvals for at-risk changes and red-line changes.

An inspection sample of nine FCRs was selected for review where the lead design discipline was electrical engineering. A sample of five FCRs was selected in the plant design discipline (e.g. supports and stress analysis). An additional six FCRs were selected that affected equipment supports and instrumentation. The inspection scope included evaluations of the following attributes:

- Design change documents, including engineering document construction releases (EDCRs), associated design verification reports (DVRs), associated FCRs, master equipment lists, and associated drawing revision authorizations (DRAs) were reviewed to determine whether the documents were prepared, verified, approved, and controlled in accordance with the TVA Nuclear Quality Assurance Plan, the Bechtel Project Nuclear Quality Assurance Manual, and project procedures
- FCR documentation was reviewed to determine whether the documents identified the reasons or need for the changes
- The FCR changes were evaluated to confirm the changes did not compromise the original design intents and that design input assumptions remained valid
- The inspectors evaluated whether FCR changes were subject to controls commensurate with that provided for the original designs (inspectors considered

impact on overall design by reviewing the adequacy of FCR changes, impact on other disciplines, and need to change prior analyses)

- Reviews determined whether design output documents, including drawings were updated to accurately reflect new or changed design configurations
- For the Advance Authorization (AA) changes released for work at-risk without design verification, the reviews determined whether the unverified changes and related construction activities were adequately controlled during the unverified periods
- For changes that had been implemented in the field, the inspectors reviewed a sample of work orders and field implementation data sheets to verify work was completed in accordance with the approved field change request
- Effective performance of activities, including roll-up of red-line changes, was evaluated through interviews with field engineers, design engineers, quality assurance management, and direct field inspections of completed installations

The inspectors reviewed QA audits and surveillances conducted in 2011 and 2012 and interviewed responsible managers to evaluate the extent of independent oversight for design activities. The review provided a determination whether the scope and schedule of audits were consistent with activities being performed at the site, whether audit findings were adequately addressed through the corrective action program, whether issues were properly screened for significance and reportability, and if substantive findings were reported to responsible management. The audit results were reviewed to determine whether audit conclusions were consistent with problems being reported in the corrective action program. Three QA audits and five QA surveillances were reviewed.

Documents reviewed for this inspection are listed in the attachment.

The following samples were inspected:

- IP 37055 Section 02.03.b – 20 samples
- IP 37055 Section 02.05.c – 3 samples
- IP 37055 Section 02.06 – 2 samples

b. Observations and Findings

The inspection of the implementation of design controls identified the following Severity Level (SL) IV Non-Cited Violation (NCV):

Introduction: A SL IV NCV of 10 CFR50, Appendix B, Criterion XVII, "Quality Assurance Records," was identified by the inspectors for the failure to sufficiently record and furnish evidence of activities affecting quality. Specifically, quality records for a FCR, drawing revision authorization, and EDCR were closed and authenticated as correctly documenting the installation of wiring for the safety injection accumulator tank nitrogen valve position control indications. However, a field walkdown of the completed configuration by the inspectors identified a jumper wire was not installed on terminal A1-47 from point 3 to 7 as certified by EDCR 52363-A and DRA 52363-14.

Description: The inspectors reviewed completed FCR 55144-A, at-risk advance authorization AA-06, and DRA 52363-14. The inspectors interviewed design engineers and reviewed the closure documentation for the controlling EDCR 52363-A. The quality



record review and design engineering interviews established that the closure of the EDCR indicated that the installation of the jumper on terminal A1-47 between points 3 and 7 on the safety injection system accumulator nitrogen inlet valve, 2-HS-63-64A, had been completed in accordance with FCR 55144-A, DRA 52363-14, and WO 09-954101-015. In contrast, the inspectors' walkdown of the completed wiring for the safety injection system accumulator tank nitrogen header inlet valve, 2-HS-63-64A, control room indications in panel 2-M-6 identified that a jumper necessary for functionality of the control room circuitry was not installed on terminal block A1-47 between terminals 3 and 7.

The EDCR was authenticated as complete and correct even though the full work scope described in an associated field change request was not accomplished. The work order that was issued to install the wiring, WO 09-954101-015, documented that the wiring had not been installed; however, it incorrectly indicated that the work was accomplished under another design control package, EDCR 52453. The inspectors' review of EDCR 52453 found that the EDCR did not include instructions to install the missing wire. Information recorded in EDCR 52453-A incorrectly indicated the jumper had previously been installed.

The applicant's failure to ensure that the QA record of the activity, specifically EDCRs 52363-A and 52453-A were sufficient, as required by 10 CFR50, Appendix B, Criterion XVII, in documenting the as installed configuration of the safety injection system accumulator tank nitrogen header inlet valve is a performance deficiency. The applicant issued PER 628404 to address the issue. This finding is considered more than minor because it is similar to Inspection Manual Chapter 2517, Appendix C, Example 1.a, where the inaccurate quality record could preclude the applicant from being able to take appropriate action on safety-significant matters, or the NRC from objectively or properly assessing, auditing, or otherwise evaluating significant activities. The inspectors determined this finding to be a SL-IV violation, in accordance with Section 6.5 of the Enforcement Policy because the applicant failed to establish, maintain, or implement adequate controls over construction processes that are important to safety. However, this finding did not represent a breakdown in the applicant's QA Program for construction related to a single work activity.

No cross-cutting aspects were identified for this finding.

Enforcement: Appendix B, Criterion XVII, "Quality Assurance Records" of 10 CFR Part 50, states, in part, that: "Sufficient records shall be maintained to furnish evidence of activities affecting quality..." Section 6.3.2 of procedure TVA-NQA-PLN89-A Rev.26, Nuclear Quality Assurance Plan states, "Sufficient records and documentation shall be prepared and maintained to provide evidence of the quality of items or activities affecting quality..." Additionally, Bechtel Engineering Department Procedure Instruction for EDCRs, 25402-3DP-G04G-00081 Rev. 14, section 4.8 states, in part, that: "SSCs are considered design complete when the design changes (EDCRs) have been issued and all regulatory requirements and open items have been closed."

Contrary to the above, the quality records failed to provide sufficient evidence that the documented activity affecting quality was consistent with the installed field configuration. Specifically, EDCRs 52363-A and 52453-A incorrectly indicated that the jumper was installed on terminal A1-47 between points 3 and 7 on the safety injection system accumulator nitrogen inlet valve, 2-HS-63-64A.

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 example supporting the violation 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. This violation is identified as NCV 05000391/2012609-01, "Failure to maintain sufficient quality records of completed construction activities."

c. Conclusion

With the exception of the EDCR identified in the non-cited violation, the design changes reviewed for this inspection were completed in accordance with established procedures and the applicant's QA program.

#### IV. OTHER ACTIVITIES

##### **OA.1.1 (Discussed) NRC Bulletin 88-05: Nonconforming Materials Supplied by Piping Supplies, Inc., at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey (Inspection Procedure 92717)**

a. Inspection Scope

The inspectors observed hardness testing on five flanges associated with Bulletin (BL) 88-05 to determine whether the testing was conducted in accordance with procedures, specifications, and manufacturer's guidelines. The inspectors observed calibration of the hardness testing equipment to determine whether the calibration was conducted in accordance with procedures and that the equipment met the allowable tolerances. The inspectors reviewed procedure N-GP-24, "Hardness Testing," Rev. 6, to determine whether the procedure included manufacturer's guidelines and correct hardness conversion tables.

Hardness for the following flanges (identified by weld number) was observed:

- 2-015A-T001-90A, Heat No. 6579
- 2-015A-T001-94A, Heat No. CAO
- 2-015A-T010-95, Heat No. 6579
- 2-015A-T004-95A, Heat No. CAO
- 2-015A-T001-99C, Heat No. CAO

b. Observations and Findings

No findings were identified.

c. Conclusions

The observed hardness testing and equipment calibration was conducted in accordance with procedures, specifications, and manufacturer's guidelines. The procedure reviewed incorporated manufacturer's guidelines and correct hardness conversion tables.

## **OA.1.2 (Discussed) Hydrogen Igniter Backup Power –Generic Safety Issue-189 (Inspection Procedure 35007)**

### a. Inspection Scope

Background: An evaluation was performed for the potential of early failure of containment during very low probability events involving damage to the reactor core as discussed in NUREG/CR-6427, "Assessment of the Direct Containment Heat Issue for Plants with Ice Condenser Containments." The results of the evaluation revealed an early containment failure probability of ice condenser containments, dominated by hydrogen combustion following core damage events. Plants with these containment designs use hydrogen igniters to control the buildup of hydrogen. The existing hydrogen igniters rely on the plant AC power distribution system for power, and AC power may not be available for certain events with the potential to result in severe core damage. Therefore, for the hydrogen igniters to be effective in preserving containment integrity, the igniters must have power before a buildup of hydrogen has developed (i.e., before severe core damage has occurred).

To resolve GSI-189, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion during a Severe Accident," the staff recommended the addition of a backup power supply for the hydrogen igniters for plants with ice condenser containments. A regulatory analysis indicated the backup power modification may provide a substantial safety benefit at a justifiable cost for the PWRs with ice-condenser containments, and voluntary measures proposed by the licensees for these facilities provided the majority of the benefit. The capability to provide backup power to the igniters for events involving severe core damage coincident with a station blackout is beyond the current design basis of affected facilities. The changes at these units involve development of procedures and training to support connection of an existing large, mobile diesel generator to the electrical distribution system in a manner that provides power to at least one train of igniters through temporary connections.

### Inspection Activities:

The inspectors reviewed the applicant's documentation on equipment arrangement for the portable diesel generator, the associated dry type transformer, and the temporary service for the battery charger inside the portable diesel generator to verify component capacity and service ratings. The inspectors reviewed wiring diagram drawings to determine the adequacy of the design. The inspectors reviewed calculations to verify that the generator load was within the manufacturer's rating with the addition of the hydrogen igniters' load on the generator. The inspectors reviewed portable diesel generator load testing records to verify actual test loads applied and test duration adequacy. The inspectors performed a walkdown of the procured equipment staged at the site to confirm that the equipment characteristics and nameplate data were consistent with the drawings.

### b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the review, the applicant's documentation of the backup power system capacity was adequate. This item will remain open and require further inspection of the final system configuration.

**OA.1.3 (Closed) Temporary Instruction 2515/028, Inspection Requirements to Review Licensee Actions Taken in Response to Bulletin 79-02, Rev. 1 (Inspection Procedure 46071)**

a. Inspection Scope

Background: Temporary Instruction (TI) 2515/028 was issued on July 1, 1979, to verify that TVA had taken actions on the issues required by BL 79-02, Rev. 1. Inspection Procedure 46071, "Concrete Expansion Anchors," was issued on December 17, 1986, with the objective to confirm concrete expansion anchors were properly installed and that the applicant's response was consistent with commitments made in response to BL 79-02. Inspection Procedure 46071 was closed in NRC Integrated Inspection Report (IIR) 05000391/2011609, Section C.1.8. This report documented the inspection of field work and review of procedures and records associated with concrete expansion anchors for Unit 2. BL 79-02 was later inspected, documented, and closed in IIR 05000391/2012608 for Unit 2, Section OA.1.10. These combined inspection efforts documented in the inspection report were conducted following guidance contained inspection procedure 46071 and TI 2515/028.

Inspection Activities: The inspectors reviewed the above IIR associated with BL 79-02 to determine if sufficient NRC inspection activities had been performed to adequately address TI 2515/028.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the inspection reports reviewed, the inspectors concluded that the previous inspection documented under BL 79-02 adequately addressed TI 2515/028. TI 2515/028 is closed.

**OA.1.4 (Closed) Temporary Instruction 2515/029, Inspection Requirements for Bulletin 79-14 (Inspection Procedure 50090 and Temporary Instruction 2515/023)**

a. Inspection Scope

Background: TI 2515/029 was issued on September 14, 1979. The objective of this TI was to provide guidance for inspection and review of licensees' actions and written responses to BL 79-14. Inspection Procedure 50090 also covered aspects of BL 79-14 which requested that licensees assure that seismic analyses of safety-related piping systems accurately reflected the as-built configuration of the plant.

BL 79-14 was inspected, documented, and closed in inspection report 05000391/2012608, Section OA.1.11 for Unit 2. The combined inspection efforts documented in the inspection report were conducted following guidance contained IP 50090 and TI 2515/028.

Inspection Activities: The inspectors reviewed IIR 05000391/2012608 (ADAMS Accession Number ML 11311A082) associated with BL 79-14 to determine if sufficient inspection activities had been performed to verify TI-2515/029 was adequately addressed.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the activities reviewed in IIR 05000391/2012608, the inspectors concluded that TI 2515/029 is closed.

**OA.1.5 (Closed) Construction Deficiency Report 391/87-11, Failure to Coordinate Solenoid Valve Replacement Documents (Inspection Procedure 35007 and 51053)**

a. Inspection Scope

Background: The subject deficiency was initially reported to the NRC for Unit 2 on March 24, 1987 in accordance with 10 CFR 50.55(e). After review, the NRC determined this deficiency was associated with notice of violation 50-391/86-18-01 issued previously as part of NRC Inspection Report 50-390/86-18 and 50-391/86-18.

The notice of violation concerned TVA's "failure to translate design requirements, including vendor specifications, into specifications, drawings, procedures, or instructions as required by 10 CFR Part 50, Appendix B, Criterion III." The following two specific examples were cited.

- The American Switch Company (ASCO) Solenoid Valves Manual NP-1 requirements to orient solenoid valves, model 206.381, vertical and upright, were not translated into installation instructions. This failure resulted in installed equipment not meeting vendor requirements.
- Seismic requirements of IEEE 344-1975, which requires the effects of electrical connections, conduit, and sensing lines, etc., to be considered, were not translated into installation instructions. This failure resulted in inadequately installed equipment, as referenced in construction Deficiency Report (CDR) WBRD 50-390/86-59.

CDR 391/87-11 addressed only the first example. The second example was documented in CDR 391/86-59.

As a result of several EDCRs, the applicant intended to remove and replace all ASCO solenoid valves for Unit 2. NCO080008030 was written to track this issue. This package was reviewed as part of the closure for BL 75-03, and was documented in NRC

Inspection Report 05000391/2012602. When the initial engineering change notice (ECN) was issued for this package, it did not include civil or mechanical disciplines in the review. The root cause of this deficiency was the failure to perform appropriate inter-discipline reviews of the ECN before implementation, which was addressed by CDR 391/87-11.

The seismic adequacy of the solenoid valve installation was subject to evaluation because a change in configuration and/or mass of the solenoid valves could render the seismic qualification invalid. Vendor drawings indicated that the installation of ASCO solenoid valves must be upright within 45 degrees of vertical to ensure operation. If the configuration of the installations was different than specified by the vendor, operation of the solenoid valves could not be ensured.

Inspection Activities: The inspectors reviewed calculation WCG-ACQ-0125, "Seismic Evaluation of Control Valves/Dampers Due to the Replacement of Solenoid Valves," which included assessments of the weight differential for each solenoid valve and the effect of the weight variation of the assembly on the dampers to verify the seismic evaluation was not compromised by replacement solenoid valves. The inspectors reviewed several design change procedures within the WO package to ensure appropriate inter-discipline reviews were required for design changes. The inspectors reviewed work orders for the installation of auxiliary feedwater pump flow control valves 2-FCV-003-355A and 2-FCV-003-359B to verify the implementation of work packages. Inspectors interviewed responsible engineering staff involved with the seismic calculations and the installation instructions contained within the WO package to verify adequacy of seismic design margins, solenoid valve weights, and installation requirements for proper alignment of solenoid valves. The inspectors observed the physical installation of the solenoid valves listed above inside the Auxiliary Building at elevation 713' column line A12S and verified the valves were installed in the upright position in accordance with manufacturer's instructions.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on reviews of the applicant's final completion package, calculations, and revised installation instructions, the inspectors determined the applicant has adequately addressed the issues identified in the CDR. CDR 391/87-11 is considered closed.

**OA.1.6 (Closed) Construction Deficiency Report 391/87-23: Failed Motor Pinion Keys & Motor Shaft in Limitorque Operator (Inspection Procedure 50075)**

a. Inspection Scope

Background: The applicant identified multiple motor-operated valves (MOVs) with failed motor pinion keys and motor shafts in Limitorque electric actuators. Limitorque was the original equipment manufacturer that supplied the MOV electric actuators for WBN Unit 2. These failures consisted primarily of circumstances resulting from high impact loading

on components inside of high speed MOV actuators that had valve stem speeds greater than 50 inches/minute. The applicant implemented modifications to these high speed Limitorque actuators that experienced rapid impact overloading. The modifications consisted of slowing down many of these MOV actuators so they would have valve stem speeds of less than 50 inches/minute, and had the motor shaft and motor pinion gear key fabricated from higher strength American Iron and Steel Institute (AISI) 4140 material.

Inspection Activities: The inspectors reviewed the applicant's complete EDCR closure packages, purchase order, specification, corrective actions, and WOs to ensure that proposed actions satisfied the concerns identified in CDR 391/87-23. The inspectors reviewed several corrective action documents to verify proper actions were implemented by the applicant that addressed and corrected these failures and prevented recurrence.

The inspectors reviewed TVA WOs and maintenance instructions to ensure that adequate requirements existed in the instructions for the maintenance of MOV actuators. Additionally, the inspectors reviewed several TVA Maintenance Instructions used for performing maintenance on various sizes and types of Limitorque actuators to ensure that proper motor pinion gear key material was specified to prevent inadvertent installation of the wrong key material. The inspectors reviewed the PO and design specification used to purchase the replacement safety-related electrical MOV actuators to verify these documents contained requirements to obtain the new higher strength AISI 4140 material for the motor shafts and motor pinion gear keys.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based upon the review of the applicant's completed engineering complete package, EDCRs, WOs, and additional documentation, the inspectors concluded that the scope and effectiveness of the applicant's corrective actions were the same as Unit 1, are in compliance with all applicable requirements, and are adequate to address this sub-issue/CDR. Based on these actions, CDR 391/87-23 is closed.

**OA.1.7 (Closed) Construction Deficiency Report 391/91-12: Undersized Component Cooling System Instrumentation for Reactor Coolant Pump Thermal Barriers (Inspection Procedure 35007)**

This item was previously closed in IIR 2012608, Section OA.1.19, as CDR 390/91-12. The item identifier should have been documented as CDR 391/91-12. The number 390 refers to the docket number for Watts Bar Unit 1, while the number 391 refers to the docket number for Unit 2. This section documents the change to Section OA.1.19 in IIR 2012608 to CDR 391/91-12. This was a typographical error, and no changes to the inspection activities or inspection conclusions were necessary.

## **V. MANAGEMENT MEETINGS**

### **V.1 Exit Meeting Summary**

An exit meeting was conducted on November 30, 2012 to present inspection results to Mr. Hruby, General Manager, and other members of his staff. The inspectors identified that no proprietary information had been received during the inspection and none would be used in the inspection report. The areas inspected were described, inspection activities, and discussed the inspection results. The applicant acknowledged the observations provided with no dissenting comments.



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Applicant personnel**

A. Bangalore, Bechtel – Electrical Design  
D. Beckley, Bechtel – Electrical Engineer  
G. Lee, TVA – Sr. Metallurgical Engineer  
G. Scott, TVA - Licensing  
J. Boykin, TVA – Quality Control  
J. O'Dell, TVA – Licensing  
M. McGrath, TVA – Licensing  
R. Enis, TVA – Civil Oversight  
A. Hart, Construction Supervisor  
T. Das, Civil Engineer  
M. Usman Quraishi, Electrical Engineer  
J. Mills, Valve Design Engineer  
R. Phipps, Electrical Foreman  
B. Pittman, MOV Test Engineer  
C. Walker, MOV Engineer

#### **INSPECTION PROCEDURES USED**

IP 35007	Quality Assurance Program Implementation During Construction
IP 37002	Construction Refurbishment Process – Watts Bar Unit 2
IP 46071	Concrete Expansion Anchors
IP 50073	Mechanical Components - Work Observation
IP 50053	Reactor Vessel and Internals Work Observation
IP 57090	Pipe Support and Restraint Systems
IP 50075	Safety-Related Components – Records Review
IP 50090	Pipe Support and Restrain Systems
IP 51053	Reactor Vessel and Internals Work Observation
IP 49063	Piping – Work Observation
IP 37055	Onsite Design Activities
IP 92717	IE Bulletins for Information and IE Information Notice Follow-up
TI 2512/028	Inspection Requirements to Review Licensee Actions Taken in Response to IE Bulletin 79-02, Revision No. 1
TI 2515/029	Inspection Requirements for IEB 79-14

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Open and Closed

391/2012608-01	NCV	Failure to maintain sufficient quality records of completed construction activities (Section E.1.1)
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Closed

2515/028	TI	Inspection Requirements to Review Licensee Actions Taken in Response to Bulletin 79-02, Rev. 1 (Section OA.1.3)
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2515/029	TI	Inspection Requirements for Bulletin 79-14 (Section OA.1.4)
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391/87-11	CDR	Failure to Coordinate Solenoid Valve Replacement Documents (Section OA.1.5)
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391/87-23	CDR	Failed Motor Pinion Keys & Motor Shaft in Limitorque Operator (Section OA.1.6)
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391/91-12	CDR	Undersized Component Cooling System Instrumentation for Reactor Coolant Pump Thermal Barriers (Section OA.1.7)
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Discussed

88-05	BL	Nonconforming Materials Supplied by Piping Supplies, Inc., at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey (Section OA.1.1)
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189	GSI	Hydrogen Igniter Backup Power (Section OA.1.2)
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## LIST OF DOCUMENTS REVIEWED

### II. MANAGEMENT OVERSIGHT AND CONTROLS

#### C.1.2 Mechanical Components – Work Observation and Construction Refurbishment Process (Inspection Procedures 50073 and 37002)

##### Corrective Action Documents

PCI NCR 902741-15, Repair of Cladding in Steam Generator 1 Hot Leg Channel Head

##### Specifications

G-679059, Westinghouse Design Specification – Model D Steam Generator, Rev. 9

##### Certificate of Compliance

PCI Certificate of Compliance No. 902741-01

##### Work Orders

WO 113295239, Perform Cladding Repair of #1, #3, and #4 S/G's IAW PCI QA Travelers, 9/19/2012

WO 113926835, Repair of SG3 Hot leg Side Nozzle Dam Ring Vent Hole, 10/3/2012

##### NDE Reports

PT-902741-024, SG3 Hot leg Side Nozzle Dam Ring Repair, 10/31/2012

PT-902741-025, SG3 Hot leg Side Nozzle Dam Ring Repair, 11/1/2012

##### Weld Traveler

PCI QA Traveler 902741-SG3-04 Rev.0

PCI Weld Traveler 902741-SG3-05 Rev.0

#### C.1.3 Nondestructive Examination Procedure Radiographic Examination Procedure Review/Work Observation/Record Review (Inspection Procedure 57090 and 37002)

##### Corrective Action Documents

PER 517736, Radiographic Image Deterioration of ASME Section III Class 2 Welds Associated with WBN-2 RWST

##### Design Specifications

WBNP-DS-1935-2726, Watts Bar Nuclear Plant Units 1 and 2 Refueling Water and Primary Makeup Water Storage Reservoirs, Rev. 0

##### Drawings

WM-2-56039-Q-C2/01, Refueling Water Storage Tank – Unit 2

FSK-M-5506, System 063 Weld Repair ASME Class B RWST, Rev.0

Procedures

RT-ASME/ANSI Piping, Bechtel Nondestructive Examination Standard Radiographic Examination, Rev. 5

Work Order

113611394, Repair ASME Class B Welds on 2-TANK-063-0046, 11/14/2012

Miscellaneous

Nondestructive Examination Report Radiographic Interpretation Report Numbers: RT 576 and PER 304

**C.1.4 Piping – Work Observation (Inspection Procedure 49063 and 37002)**Corrective Action Document

PER 617221, ERCW weld 0-067BN212-04 not performed in accordance with TVA processes

Specifications

G-29, Welding, Brazing, Soldering, and Heat Treatment, Rev.12

Drawings

E-2879-IC-212, Weld Map for ERCW Replacement Piping  
FSK-M-368, Turbine Driven Auxiliary Feedwater Pump Piping, Rev.3  
SK 555-18 SH.27, Weld map for system 062, Rev.14

Procedures

Welding Procedure: WPS-GT11-0-4-N, Rev.3  
Bechtel Welding Procedure: P1-AT-Lh, Rev.1  
MAI 4.2B, Pipe Installation, Rev.10

Work Order

112833358, Through Wall Leak in 90 EL. Replace 0-PIPE-067-C, 10/15/2012  
111117679, Remove and Reinstall Check Valve 2-CKV-062-0928, 10/02/2012  
113595125, Remove and Reinstall Check Valve 2-CKV-062-0928, 11/07/2012

**C.1.5 Reactor Vessel and Internals Construction Refurbishment Process (Inspection Procedure 50053)**Work Order

WO 112388257, Reactor Pressure Vessel Screw in Reactor Vessel Stud into Reactor Vessel Stud Holes, 10/31/2012

**C.1.6 Electrical Components and Systems – Work Observation (IP51053)**

Work Orders

- WO 113488284, CCE BC Conduit EDCR2 552333 System 030 290 WBN-2-MISC-290  
2PM9659B, 08/21/2012
- WO 113866338, CCE EDCR 55233 FCR 55856 SYS 292 074 WBN-2-MISC-293, 09/12/2012
- WO 113251621, CCE BC Conduit EDCR2 52321 WBN-2-MISC-293, 02/28/2012
- WO 113537209, CCE BC Conduit EDCR2 54636 SYSTEM 001 292 WBN-2-MISC-292  
2VC6139A, 2VC6140A, 2-JB-292-8107A, 10/04/2012
- WO 110710559, CCE EDCR2 (U1RG Approved) 54636 SYS 292 2-MISC-292, 03/04/2010
- WO 113280423, Conduit 2CR4683A from system 292 Auxiliary Building Conduit & Cable Tray  
System at elevation 737'
- WO 113280563, Conduit 2PLC5247A from system 292 Auxiliary Building Conduit & Cable Tray  
System at elevation 772' (column line A12T) and Control Building at elevation 741' (column  
line C8P)
- WO 111095010, Conduit 2VC6146A from system 292 Auxiliary Building Conduit & Cable Tray  
System at elevation 757' (column line A6R) and at elevation 729' (column line A13WB)

Specifications

- MAI-3.1, Installation of Conduit Systems and Conduit Boxes, Rev. 17
- G-40, Installation, Modification, and Maintenance of Electrical Conduit, Cable Trays, Boxes,  
Containment Electrical Penetrations, Rev. 24

**E.1.1 Onsite Design Activities (Inspection Procedure 37055)**EDCRs

- 52363-A, Instrumentation and wiring for Main Control Room Panel, 2/9/2011
- 52453, Instrumentation and wiring for Main Control Room Panel, 116/2009
- 52370-A, Instrumentation and wiring for Main Control Room Panel, 3/22/2010
- 52359-A, Instrumentation and wiring for Main Control Room Panel, 8/17/2009
- 53069, Cable and Conduit for 480V shutdown Board, 3/26/2010
- 55233, Cable and conduit routing throughout the plant; 5/3/2010

FCRs

- 55396-A, Red Line Roll-Up, Pipe Supports, 3/22/2010, related to EDCR 52578
- 56844-A, Red Line Roll-Up, Pipe Supports, 1/17/2011, related to EDCR 52578A
- 57368, Red Line Roll-Up, Pipe Supports, 1/29/2011, related to EDCR 53344
- 55452-A, Red Line Roll-Up, 5/6/2010, related to EDCR 52578
- 55144-A, Instrumentation and Wiring changes associated with Main Control Room Panel  
(Advanced Authorized Changes); 02/03/2011; related to EDCR 52363-A
- 55095-A, Instrumentation and Wiring changes associated with Main Control Room Panel  
(Advanced Authorized Changes); 03/16/2010; related to EDCR 52370-A
- 54982-A, Instrumentation and Wiring changes associated with Main Control Room Panel  
(Advanced Authorized Changes); 11/23/2009; related to EDCR 52359-A
- 59759-A, Cable and Conduit routing throughout the plant, 07/31/2012, related to EDCR 53069
- 59864-A, Cable and Conduit routing throughout the plant, 08/10/2012, related to EDCR 55233-2
- 54755-A, Instrumentation and Wiring Changes associated with Main Control Room Panel  
(Advanced Authorized Changes); 07/20/2012; related to EDCR 52360-A
- 54914-A, Instrumentation/wiring changes for Main Control Room Panel (Advanced Authorized  
Changes); 11/23/2010; related to EDCR 52362-A
- 55673-A, Change allowable gap on pipe support, 05/11/2010; related to EDCR 52509

59866-A, Mounting bracket changes for MOV Limit Switch; 08/15/2012; related to EDCR 2-54851  
 59869-A, Remove the restriction of interim support prior to work. Also allow field to work on Group-2 & Group-3 supports in any order  
 59870-A, Update EDCR re the status of a flow indicator in the SGWLRS; 08/1/2012; related to EDCR-2 54263  
 60019-A, Cut access holes in 16" pipe to expose pipe clamp and install cover plates over holes  
 60037-A, Revise sequencing of support modifications to allow work without the addition of temporary supports  
 60051-A, Request approved AA's from FCR 59755 be final approved  
 60074-A, Support modified as shown in attached DRAs  
 60086-A, Update drawings to permit use of typical conduit support in other building areas; Approved 9/10/2012; related to EDCR 54633-2

### Work Orders

09-954101-015 for EDCR 55144-A  
 110822037 for EDCR 59759-A

### Procedures

Engineering Department Procedure Instruction 25402-3DP-G04-00062, Field Change Request, Rev. 17  
 Engineering Department Procedure Instruction 25402-3DP-G04G-00081, Engineering Document Construction Release, Rev. 14  
 Construction Completion Project Procedure 25404-000-GPP-0000-N3105, Field Change Requests, Rev. 14

### Design Verification Reports

DVR for FCR 59864-A  
 DVR for FCR 54982-A  
 DVR for FCR 55095-A  
 DVR for FCR 55144  
 DVR for FCR 60037-A  
 DVR for FCR 60051-A  
 DVR for FCR 60074-A

### Calculations

WCG-2-657, Identification of Structural interface Boundary for Selected Permanent ABSCE Pipe Penetrations and Isolation Devices, pages C19, C20a and C24, Rev. 6, 09/17/12

### QA Audits and Surveillances

25402-WBN-AR-11-0003, Design Control, Rev. 0  
 25402-WBN-AR-12-0003, Bechtel Construction Operations (BCOI) and Bechtel Power Corporation (BPC) ASME Section III Division 1 Part 2 Addenda Bechtel Quality Assurance Manual Implementation, Rev. 0  
 25402-WBN-SR-11-1767, EDCR Scope Transfer Using FCRs, 06/02/2011  
 25402-WBN-SR-11-1774, Field Change Request (FCR) Approval Process, 06/07/2011  
 25402-WBN-SR-11-2071, FCR Review – Red Line Rollup, 12/13/2011  
 25401-WBN-SR-12-2182, EDCR Closure Review, 5/9/2012

25402-WBN-SR-12-2283, Field Change Request Initiation, Review, and Approval, 09/06/2012  
 NGDC1201, QA Program Verification – Design Control and Procurement Document Control,  
 09/06/2012

#### Corrective Action Documents

PER 353175 Design output errors in design change documents  
 PER 366098 Design output error  
 PER 431157 At-Risk changes were not incorporated into final FCR  
 PER 438434 Implementing work order was not revised to address revision to DRA  
 PER 458911 Unauthorized approver for At-Risk design change  
 PER 468120 Quality and technical requirements inadequately specified in At-Risk FCR  
 PER 471182 Improper use of Red-Line process  
 PER 471193 At-Risk FCR omitted controls for receipt of quality materials  
 PER 475525 Red Line was not fully documented  
 PER 488704 Inadequate documentation of as-built configuration  
 PER 510287 (Recurring Issue) scopes of work defined in EDCRs were not fully implemented.  
 PER 512563 Red-Line process used instead of FCR  
 PER 528302 At-Risk FCR AAs were not being posted on a timely basis  
 PER 541047 The scopes of work defined in At-Risk FCRs were not fully implemented  
 PER 543210 A work completion record incorrectly documented that a DCN was completed  
 PER 556027 QA surveillance failures to track incomplete tasks  
 PER 565286 QA audit technical justification and engineering approval was not obtained  
 PER 589569 QA surveillance failure to implement requirements in a design control document  
 PER 595046 EDCR closed with a DRA not fully implemented  
 PER 598490 Design revision not implemented in the affected work order  
 PER 596357 No change document was issued for changes to a procurement specification  
 PER 598518 Design error identified in At-Risk FCR for sealing 3-Hour penetration fire barrier  
 PER 599603 Configuration specified by design was not implemented in the plant  
 PER 600883 Design output error resulted in non-functional component  
 PER 613850 QA surveillance deficiencies in documentation of Red-Line changes  
 SR 626085 Inaccurate record of as-installed field change request  
 SR 626091 Incorrect application of required verifications in design verification checklist  
 SR 626360 Failure to implement requirement for field engineer review of FCRs approved  
 with changes

#### **IV. OTHER ACTIVITIES**

**OA.1.1 (Discussed) NRC Bulletin 88-05: Nonconforming Materials Supplied by Piping  
 Supplies, Inc., at Folsom, New Jersey and West Jersey Manufacturing Company at  
 Williamstown, New Jersey (Inspection Procedure 92717)**

#### Corrective Action Documents

PER 234500, Materials supplied by West Jersey Manufacturing Inc. or Piping Supplies Inc.

#### Specifications

G-679059, Westinghouse Design Specification – Model D Steam Generator, Rev. 9

Hardness Test Reports

Reports for Piece Item No.: 2-015A-T010-90, 2-015A-T010-95, 2-015A-T001-90A, 2-015A-T001-94A, 2-015A-T004-95A, 2-015A-T001-99C, 2-015A-T017-99E, 2-015A-T001-95, 2-015A-T005-19, 2-015A-T005-20

Work Order

111620338, Perform Hardness Tests

**OA.1.2 (Discussed) Hydrogen Igniter Backup Power – GSI-189. (IP35007)**Drawings

2-45W756-2, Wiring Diagrams 480V CONT & AUX BLDG VT BD 2A1-A Single Line SH-2, Rev. 0  
 1-15E500-1, Key Diagram Station AUX Power System, Rev. 36  
 1-15E500-2, Key Diagram Station AUX Power System, Rev. 42

**OA.1.5 (Closed) CDR 391/87-11, Failure to coordinate solenoid valve replacement documents (IP 35007, 51051, 51053, and 51055)**Calculation

WCG-ACQ-0125, "Seismic Evaluation of Control Valves/Dampers Due to the Replacement of Solenoid Valves," Rev 2

Corrective Action Documents

PER 143772, "Lack of Interface Review on ECN Which Replaces Solenoid Valves," 06/06/2012

Work Orders

WO 110887849, CCI EDCR 53276 System 032 2-ISV-032-9136, Rev. 2  
 WO 08-953136-003, Install/Add MDAFWP Recirculation Lines with Isolation Valve, Flow Control Valve and Orifice. Rev. 0

**OA.1.1 CDR 391/87-23, MOV Worm Shaft Clutch Gear Failure; and CDR 391/889-01 MOV Motor Pinion Key and Motor Shaft Failures (IP 50075)**Procedures

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**LIST OF ACRONYMS**

AA	advance authorization
AISI	American Iron and Steel Institute
ASCO	American Switch Company
ASME	American Society of Mechanical Engineers
B&PV	Boiler & Pressure Vessel
BL	Bulletin
CDR	Construction Deficiency Report
CFR	Code of Federal Regulations
DRA	Drawing Revision Authorization
DVR	design verification reports
ECN	Engineering Change Notice
EDCR	Engineering Document Construction Release
EPC	engineering, procurement, and construction
ERCW	Essential Raw Cooling Water
FCR	field change request
IIR	integrated inspection report
IP	Inspection Procedure (NRC)
MOV	Motor-Operated Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PER	Problem Evaluation Report
PO	purchase order
QA	Quality Assurance
Rev.	Revision
RWST	refueling water storage tank
SL	Severity Level
TI	Temporary Instruction
TVA	Tennessee Valley Authority
WBN	Watts Bar Nuclear Plant
WO	Work Order