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

December 18, 2013

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

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2013609

Dear Mr. Skaggs:

On November 16, 2013, 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 21, 2013 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 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 the violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the non-cited violation 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 Resident Inspector at the Watts Bar Unit 2 Nuclear Plant. In addition, if you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at Watts Bar Unit 2 Nuclear Plant.

In accordance with 10 *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC 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 Haag, Chief
Construction Projects Branch 3
Division of Construction Projects

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

Enclosure: Inspection Report 05000391/2013609 w/Attachment

cc w/encl: (See next page)

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cc w/encl: (See next page)

* Previous Concurrence

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Letter to Michael D. Skaggs from Robert C. Haag dated December 18, 2013.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2013609

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-391
Construction Permit No.:	CPPR-92
Report No.:	05000391/2013609
Applicant:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Unit 2
Location:	Spring City, TN 37381
Dates:	September 29 – November 16, 2013
Inspectors:	T. Nazario, Senior Resident Inspector, Construction Projects Branch (CPB) 3, Division of Construction Projects (DCP) Region II (RII) R. Lewis, Resident Inspector, CPB3, DCP, RII E. Patterson, Resident Inspector, CPB3, DCP, RII S. Temple, Resident Inspector, CPB3, DCP, RII C. Jones, Senior Construction Inspector, Construction Inspection Branch (CIB) 1, Division of Construction Inspection (DCI), RII, Sections Q.1.3, Q.1.4, Q.1.5, Q.1.6, Q.1.7, Q.1.8, Q.1.9, Q.1.10, Q.1.11, Q.1.12, Q.1.13, Q.1.14, and Q.1.15 C. Taylor, Senior Construction Project Inspector, CPB1, DCP, RII, Sections Q.1.3, Q.1.4, Q.1.5, Q.1.6, Q.1.7, Q.1.8, Q.1.9, Q.1.10, Q.1.11, Q.1.12, Q.1.13, Q.1.14, and Q.1.15 A. Artayet, Senior Construction Inspector, CIB3, DCI, RII, Sections Q.1.3, Q.1.4, Q.1.5, Q.1.6, Q.1.7, Q.1.8, Q.1.9, Q.1.10, Q.1.11, Q.1.12, Q.1.13, Q.1.14, and Q.1.15 M. Magyar, Construction Project Inspector, CPB2, DCP, RII, Sections Q.1.3, Q.1.4, Q.1.5, Q.1.6, Q.1.7, Q.1.8, Q.1.9, Q.1.10, Q.1.11, Q.1.12, Q.1.13, Q.1.14, and Q.1.15 C. Cheung, Construction Project Inspector, CPB2, DCP, RII, Sections Q.1.3, Q.1.4, Q.1.5, Q.1.6, Q.1.7, Q.1.8, Q.1.9, Q.1.10, Q.1.11, Q.1.12, Q.1.13, Q.1.14, and Q.1.15. S. Smith, Senior Construction Inspector, CIB2, DCI, RII, Section Q.1.4 J. Baptist, Senior Construction Project Inspector, CPB3, DCP, RII, Sections P.1.1, P.1.2, and OA.1.2 A. Wilson, Construction Project Inspector, CPB3, DCP, RII, Section OA.1.3

Enclosure

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

EXECUTIVE SUMMARY

Watts Bar Nuclear Plant, Unit 2

This integrated inspection included aspects of engineering and construction activities performed by TVA associated with the Watts Bar Nuclear (WBN) Plant Unit 2 construction project. This report covered a seven-week period of inspections in the areas of quality assurance (QA), identification and resolution of construction problems, construction activities, pre-operational testing, 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 V, "Instructions, Procedures, and Drawings," for failure to follow procedures. Specifically, a fastener utilized to retain a plug internal to the number two steam generator (SG) was tightened outside of the approved work process by a job-site supervisor unfamiliar with the torque wrench's operation, such that the subsequent quality control verification step did not identify a fastener tightened in excess of the design torque value. The performance deficiency was considered more than minor in accordance with Inspection Manual Chapter (IMC) 2517 because it represented an improper or uncontrolled work practice that, if left uncorrected, could impact the quality or safety of a safety-related structure, system, or component. The finding was determined to be of very low safety significance in accordance with Section 6.5 of the NRC Enforcement Policy because it is does not represent a breakdown in the QA process. The applicant issued problem evaluation report 800044, and the responsible contractor initiated nonconformance report 905601-01, to address the identified conditions. A procedural cross-cutting aspect was identified in the Work Practices component within the Human Performance area [H.4(c)]. (Section C.1.2)

- The inspectors concluded that concerns pertaining to one Inspection Follow-up Item (IFI) have been appropriately addressed for WBN Unit 2. In addition, sufficient inspections have been completed to close out five inspection procedures (IP). These items are closed.

- Other areas inspected were adequate with no findings identified. These areas included QA; piping; mechanical systems and components; electrical systems and components; fire protection; pre-operational testing activities; various NRC inspection procedures; and refurbishment activities.

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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.

Inspectors reviewed corrective actions associated with PER 705550, which dealt with post weld heat treatment requirements for existing welds (welds completed prior to the restart of Unit 2 construction) under current requirements. Specifically, inspectors reviewed a comparison between previously approved welding procedures and current procedures, and several Field Welding Checklists for existing welds which required Post Weld Heat Treatment under the current program requirements.

b. Observations and Findings

No findings were identified.

c. Conclusions

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

Q.1.2 Safety Conscious Work Environment (Inspection Procedure 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 to verify that concerns had been properly captured and addressed. The inspectors also met with the employee concerns program representatives to discuss trending information.

b. Observations and Findings

No findings 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 10 CFR 50, Appendix B, Criterion I, Organization (Inspection Procedures 35060, 35960, and 35100)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was documented in integrated inspection reports 05000391/2010610 Agencywide Document Access and Management Systems (ADAMS) accession number ML13035A201 and 05000391/2009602 ADAMS accession number ML091210420. The 05000391/2009602 report documented that the requirements for periodic review under inspection procedure 35060, 35960, and 35100 had been satisfactorily completed.

Inspection Activities: Related to the requirements of Appendix B Criterion 1, Organization, the inspectors interviewed the Senior Advisor for Tennessee Valley Authority (TVA) Quality Assurance and the Quality Assurance Manager for Bechtel, TVA's engineering, procurement, and construction contractor for Unit 2, to determine whether substantive changes had occurred to the organizational structure since the previous NRC inspection. The discussion also addressed changes in the following areas: quality assurance staffing, quality assurance policy, quality assurance procedures and the reporting mechanism to the corporate quality assurance organizations for both TVA and Bechtel.

Both TVA and Bechtel organizational charts were reviewed to determine whether any changes to the organizations since the last NRC inspection decreased the level of commitments for both quality assurance organizations and whether independence from cost and scheduling responsibilities was maintained. In addition, the inspectors interviewed quality assurance personnel to determine whether staffing levels were adequate for the scope of work. Training records were reviewed and evaluated to determine whether individuals had the proper experience and received appropriate training to perform quality assurance and control inspections on various types of construction activities for Unit 2.

The TVA and Bechtel's quality assurance manuals were reviewed by inspectors to determine if substantive policy changes had occurred. The review also evaluated whether the quality assurance manuals identified services such as engineering, procurement, and design activities and those organizations that had responsibilities to perform such activities.

Two Bechtel procedures and one TVA procedure were evaluated to determine whether revisions to the procedures followed the control process for procedure revisions and document control. In addition, one TVA and one Bechtel audit were reviewed to evaluate whether the reporting mechanism to each other's organization and their corporate quality assurance departments communicated deficiencies and trended areas to detect problems. In addition, the inspectors evaluated whether corrective actions

taken had been communicated to corporate management when instances of unacceptable performance were identified.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion I were inspected:

- IP 35060, Section 02.02
- IP 35100, Section 02.01
- IP 35960, Section 02.01

b. Observations and Findings

No findings were identified. The review of changes to the QA program and policy, and interviews with QA program management, identified that QA program changes have been implemented since the previous inspection of this area; however, none of the changes implemented resulted in reductions in the level of commitment for the applicant's and engineering, procurement, and construction contractor's QA programs.

c. Conclusion

Based upon the review of activities to implement requirements for organizational structure and interaction between TVA and Bechtel quality assurance organizations, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.4 10 CFR 50, Appendix B, Criterion II, Quality Assurance Program (Inspection Procedures 35060, 35061, 35100, 35960)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedures 35060, 35061, 35100, and 35960 were satisfactorily completed.

Inspection Activities: Related to the requirements of Appendix B Criterion II, Quality Assurance Program, the inspectors reviewed two status reports issued by Bechtel for their quality assurance program. The inspection was performed to determine if the applicant regularly reviewed the status and adequacy of the quality assurance program and evaluated the handling and recommendations from these assessments. Interviews were conducted with the quality assurance staff and engineering group. In-plant observations and reviews of documents were performed to evaluate the following items affecting quality:

- Indoctrination and training for lead auditors, auditors, and procurement and technical specialists;
- Survey and surveillance results reviewed during the assessments;

- Work orders including material instructions and assistance (MIA) in mechanical and electrical construction activities; and
- Assignment of stop work activities and stop work authority to an outside individual or contractor.

One TVA independent assessment and several Bechtel management assessments and audits were reviewed to determine whether these assessments were conducted in accordance with established policy and procedures. The reviews focused on the adequacy of the quantitative/qualitative criteria established for the assessments, qualifications of those individuals performing the assessments, corrective actions and whether these issues were captured in the corrective action program for disposition and trending purposes. Inspectors interviewed electrical and mechanical engineers to determine how vendor information is incorporated into work orders as MIA instructions. Specifically the inspectors reviewed corrective actions identified for work orders that involved MIA activities.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion II were inspected:

- IP 35060, Sections 02.02, 02.03, and 02.05
- IP 35061, Section 02.01
- IP 35100, Sections 02.01, 02.03
- IP 35960, Section 02.01

b. Observations and Findings

No findings were identified. The inspectors also determined from interviews of various engineers and quality assurance inspectors that no stop work orders had been issued since the last inspection.

c. Conclusion

Based upon the review of activities to implement requirements for program effectiveness, training and indoctrination for auditors, contract auditors, quality control and assurance inspectors, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.5 10 CFR 50, Appendix B, Criterion III, Design Control (Inspection Procedures 35060, 35100, 35960)

a. Inspection Scope

Background: An NRC assessment of this element for the construction project quality assurance programs was most recently documented as part of integrated inspection report was most recently documented as part of integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201) and 05000391/2008006 (ML081210735).

Inspection Activities: The inspectors reviewed the engineering organizational chart for the engineering, procurement, and construction contractor, Bechtel, along with their procedures, design calculations, design and engineering specifications, design changes, and drawings with applicable interface checks, reviews, and approvals that included TVA and authorized nuclear inspectors. These reviews were performed to determine whether design input and output documents assured uniform and effective translation of design, quality, and regulatory requirements in accordance with the:

- Bechtel Quality Assurance Manual ((BQAM), including WB2 Addendum to Section 3 – Design Control), and
- 1971 Edition with Addenda through Summer 1973 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, Rules for Construction of Nuclear Power Plant Components.

The inspectors reviewed three design calculations to determine whether the contents that included design input data, assumptions, design codes, quality assurance requirements, design basis, and computation were in accordance with the Bechtel engineering procedure for design calculations.

The inspectors reviewed two TVA design specifications that were developed, approved, and certified by Bechtel on behalf of TVA to determine whether the contents that included code classification and system boundaries, qualification test data, design and seismic criteria, tolerances, environmental qualification, material selection, design analysis, and quality assurance requirements were in accordance with the Bechtel engineering procedure for ASME Section III design specifications, including the use of a registered professional engineer in accordance with the requirements of ASME B&PV Code, Section III, Appendix XXIII, Qualifications and Duties of Specialized Professional Engineers.

The inspectors reviewed a TVA engineering specification for bolt anchors set in hardened concrete to determine whether the contents that included selection of materials, and procedures for installation, verification, tests, removal, and replacement of various anchors were in accordance with the Bechtel engineering procedure for control of TVA existing engineering specifications used to support the original design.

The inspectors reviewed three TVA engineering drawings, five Bechtel drawing revision authorizations, and two material requisitions describing design basis to determine whether the preparation, review, and approval of these documents were in accordance with the Bechtel engineering procedure for drawings utilizing engineering document construction release packages to maintain configuration control.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion III were inspected:

- IP 35060, Section 02.03
- IP 35100, Section 02.03
- IP 35960, Section 02.03

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for design control, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.6 10 CFR 50, Appendix B, Criterion IV, Procurement Document Control (Inspection Procedures 35060, 35065, 35960)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedures 35060, 35061, 35100, and 35960 were satisfactorily completed.

Inspection Activities: The inspectors reviewed three separate folders of purchase orders that included purchase requisitions, request for quotations, initial audit reports, and four annual supplier evaluations of vendors and suppliers that were selected from Bechtel's active evaluated supplier list (ESL). This review was performed to determine whether the technical, quality assurance, and regulatory requirements were in accordance with the BQAM (including WBN2 Addendum to Section 4 – Procurement Document Control) for rendered safety-related items and services, including applicable references to the following:

- Engineering drawings and specifications,
- Design and seismic criteria,
- Codes, standards, and specifications,
- Statements for traceability to certifications, rights of access, 10 CFR 50 Appendix B and 10 CFR 21 applicability, and
- American National Standards Institute N45.2 for QA program, N45.2.2 for quality levels of packing, shipping, handling, and storage, and N45.2.9 for retention of QA records.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion IV were inspected:

- IP 35060, Section 02.04
- IP 35065, Section 02.01
- IP 35960, Section 02.04

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for procurement document control, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.7 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings (Inspection Procedure 35061 and 51063)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35061 were satisfactorily completed.

Inspection Activities: The inspectors conducted inspections of low-voltage cable termination and cable re-landing work activities performed in accordance with work orders (WO) 112395760 and 115224334, respectively. Work order 112395760 involved terminating cable 2V4479A to a terminal block located in junction box 8709-A. Work order 115224334 involved re-landing cable 2V4246A to pigtails from solenoid valve 2-FSV-062-0143A. The inspectors reviewed applicable procedures and interviewed quality inspection personnel to determine whether quality inspection procedures and reference documents were adequately detailed to instruct the quality inspectors on what they should be looking for when performing inspections or observing tests.

Documents reviewed are listed in the attachment.

The following inspection procedure section applicable to Criterion V was inspected:

- IP 35061, Section 02.01

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on interviews with personnel and the review of activities and documents the inspectors concluded that the activities related to the above section of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.8 10 CFR 50, Appendix B, Criterion VI, Document Control (Inspection Procedures 35061, 35065, 35100, 35960 and 51053)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report

05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedures 35061, 35065, 35100, and 35960 were satisfactorily completed.

Inspection Activities: Related to the requirements of Appendix B Criterion VI, the inspectors conducted direct observations of work activities to evaluate the control of quality assurance documents, including WO 112395760 for performing low-voltage cable terminations, and WO 115224334 for lift/re-landing of low-voltage cable. Documents reviewed included documents used to control the quality control (QC) oversight activities. The inspectors reviewed the work packages for revision control, adequate installation methods, and QC inspection criteria and hold points to determine if those performing QC inspection activities have available to them the most recent and approved specifications, procedures, and instructions pertinent to activities audited, monitored, or inspected.

The inspectors witnessed a QC receipt inspection of safety-related manual switches (purchase order 564085) and selected samples of three safety-related items in stores (solenoid valve CAT ID CPQ163E, limit switch CAT ID BVG950R, and motor control center (MCC) bucket CAT ID CPP411T) to verify adequate implementation of the protection, and handling, control of procurement specifications and purchasing documents. In addition, the inspectors reviewed the respective procurement documents, material receipt reports (MRR), purchase order documents, and technical requirements. The inspectors compared the procured items to the associated records to verify that the key specifications identified in the original technical requests were translated to the purchase order and verified on the MRR. The inspectors also reviewed the associated procurement documents to determine whether changes were subjected to the same degree of control as the original document.

The inspectors interviewed engineering, procurement, and QC personnel and reviewed document control procedures to evaluate the implementation of these procedures. The interviews and reviews were conducted to determine if procedures in use were complete, reviewed, approved, and controlled. Inspectors also verified implementation of document control procedures for the review, approval, and distribution of QA Manual documents.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion VI were inspected:

- IP 35061, Section 02.01
- IP 35065, Section 02.01
- IP 35100, Section 02.04
- IP 35960, Section 02.01

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on interviews with personnel and the review of activities and documents to implement the quality program requirements for document control, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.9 10 CFR 50, Appendix B, Criterion VII, Control of Purchased Material, Equipment, and Services (Inspection Procedures 35060 and 35065)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedures 35060, and 35065 were satisfactorily completed.

Inspection Activities: Related to the requirements of Appendix B Criterion VII, the inspectors interviewed an individual in the supplier quality organization responsible for initiating changes to the status of suppliers identified on the ESL. The interview was conducted to determine whether information about supplier capabilities and performance was used for adding suppliers to the list and for defining applicable limits on allowable scope of services. The discussion also addressed whether information about ongoing supplier performance was evaluated as documented by the procurement organization in overages, shortages, damage, and discrepancy (OSDD) reports.

A printed report of information in the October 2013 version of the ESL was inspected to determine whether the ESL depicted sufficient information to show the status of supplier quality program documents that had been reviewed. In addition, a determination was made whether the report depicted the status of applicant's audits of the implementation of supplier QA programs. In addition, the review checked for evidence that the acceptance status of suppliers was documented, and that required periodic assessments and audits were up to date.

The inspectors interviewed a procurement buyer and reviewed selected OSDD reports to evaluate the implementation of monitoring and reporting of supplier performance issues. The inspection was conducted to determine if deficiencies in documentation and item conformance were being identified and trended to detect problem suppliers. In addition, the inspectors evaluated whether corrective actions had been taken when instances of unacceptable performance were identified.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion VII were inspected:

- IP 35060, Section 02.04
- IP 35065, Sections 02.01 and 02.02

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for control of purchased material, equipment, and services, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.10 10 CFR 50, Appendix B, Criterion VIII, Identification and Control of Materials, Parts, and Components (Inspection Procedure 35100)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35100 were satisfactorily completed.

Inspection Activities: The inspectors interviewed personnel responsible for material storage and quality inspection and conducted direct observation of selected items in material storage warehouses, material staging areas, and in-place storage. The inspection was implemented to determine if items were adequately marked or tagged to show unique component identification. For items released by the warehouse and staged for installation, inspectors checked to determine if there were markings or tags (e.g. material withdrawal requests (MWRs) or MRRs) for traceability to heat numbers, lot numbers, purchase orders, and procurement specifications.

The following inspection procedure section applicable to Criterion VIII was inspected:

- IP 35100, Section 02.03

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for control of purchased material, equipment, and services, the inspectors concluded that the activities related to the above section of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.11 10 CFR 50, Appendix B, Criterion X, Inspection (Inspection Procedure 35061 and 51063)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35061 were satisfactorily complete.

Inspection Activities: Related to the requirements of Appendix B Criterion X, the inspectors observed quality control inspections performed to verify acceptable installation of a low-voltage cable termination (WO 112395760), and lift and re-landing of a low-voltage cable (WO 115224334). The inspectors assessed the scope of quality control oversight to determine if quality control inspectors had available to them the most recent and approved specifications, procedures, and instructions pertinent to activities audited, monitored, or inspected. In addition, the inspectors reviewed the documentation related to the oversight activity and the method for dispositioning and controlling identified deficiencies.

The inspectors also reviewed documented deficiencies identified by quality control oversight for a cracked termination board during lift/re-landing (WO 115210115), and a wedge bolt spacing issue (WO 114864637). The inspectors reviewed the associated documentation related to the oversight activity and the method for dispositioning and controlling the deficiencies and associated resolution.

The inspectors witnessed a receipt inspection of safety-related manual switches (purchase order 564085) and evaluated quality inspection records for three safety-related items (solenoid valve, CAT ID CPQ163E, limit switch, CAT ID BVG950R, and MCC Bucket, CAT ID CPP411T) that were maintained in storage. The inspection was conducted to determine if meaningful inspections were made to verify that materials meet specifications, including the certificate of conformance. In addition, the inspectors performed physical inspection of the selected items and reviewed pertinent documents for adherence to the design and purchase requirements by comparing the procured items to the key specifications identified in the original technical requests, the purchase orders, and the documented receipt inspection on the MRR.

Documents reviewed are listed in the attachment.

The following inspection procedure section applicable to Criterion X was inspected:

- IP 35061, Section 02.01

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on the review of activities and documents to implement the quality program requirements for document control, the inspectors concluded that the activities related to the above section of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.12 10 CFR 50, Appendix B, Criterion XII, Control of Measuring and Test Equipment (Inspection Procedure 35100)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35100 were satisfactorily completed.

Inspection Activities: The inspectors observed activities at the Measuring and Test Equipment (M&TE) control area for issue, return, and storage of M&TE to determine whether the computerized barcode traceability system, legible identification markings, calibration date, and expiration date for a ⅜" drive torque wrench, contact surface thermometer, and 500 psi hydrostatic pressure gauge were controlled in accordance with the TVA procedure for measuring and test equipment and BQAM (including WBN2 Addendum to Section 12 – Control of Measuring and Test Equipment).

The inspectors reviewed in-process activities for two out-of-tolerance nonconformance evaluations for dial caliper ID# E46608 and digital multimeter ID# 548456 to determine whether the period of investigation was selected between the previous calibration date and calibration date shown on each suspect item in accordance with the TVA procedure for measuring and test equipment.

Documents reviewed are listed in the attachment.

The following inspection procedure section applicable to Criterion XII was inspected:

- IP 35100, Section 02.09

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for the control of measuring and test equipment, the inspectors concluded that the activities related to the above section of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.13 10 CFR 50, Appendix B, Criterion XIII, Handling, Storage and Shipping (Inspection Procedure 35065)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35065 were satisfactorily completed.

Inspection Activities: The inspectors interviewed personnel responsible for material storage and conducted direct observation of items in construction storage warehouses and the OP41 materials staging facility. The inspection was performed to determine if items were maintained in Level B or Level D storage as applicable. This review was accomplished by examining tagging attached to samples of stored items to determine whether the required storage levels were depicted, and comparing the information on the tags to the actual conditions for storage. The inspectors also examined material condition of the storage facilities, storage configurations (e.g. stacking, packaging, use of desiccants, etc.), adequacy of area lighting, status of storage handling tools, whether stored items or other obstructions extended into passageways, overall control of housekeeping, and control of access to storage areas.

The inspection observations conducted in Level B storage facilities examined instrumentation used to monitor storage area temperature to verify the devices were controlled as measurement and test equipment by quality control staff.

Interviews were conducted with Refurbishment Preventive Maintenance personnel and in-plant observations were performed to evaluate the following items stored in-place:

- Component cooling water system thermal barrier booster pumps
- Motor-driven auxiliary feedwater pumps
- Safety injection pump 2B

The inspectors' observations of the in-plant items evaluated provisions for maintaining minimum inventories of bearing oil; protective coatings; moisture control; prevention of intrusions by foreign material into piping, conduit and enclosures; and protection against damage from construction activities.

Direct observations of items in storage in the OP41 construction materials staging facility were conducted to determine if the items were protected in accordance with the storage levels identified on tagging attached to the items. The observations of items stored under Level B requirements were conducted to determine if the facility provided protection from extreme temperature and from weather.

The following inspection procedure sections applicable to Criterion VIII were inspected:

- IP 35065, Sections 02.03, 02.04, and 02.05

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for handling and storage of materials, the inspectors concluded that the activities related to the above sections of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.14 10 CFR 50, Appendix B, Criterion XVII, Quality Assurance Records (Inspection Procedure 35100)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report documented that the requirements for periodic review under inspection procedure 35100 were satisfactorily completed.

Inspection Activities: The inspectors reviewed various quality assurance records in the Electronic Document Management System (EDMS) to determine whether project documents were stored in accordance with the BQAM (including WBN2 Addendum to Section 17 – Quality Assurance Records) for lifetime records, such as certified material test reports (CMTR), final pneumatic test results, and ASME code data reports.

Documents reviewed are listed in the attachment.

The following inspection procedure section applicable to Criterion XVII was inspected:

- IP 35100, Section 02.03

b. Observations and Findings

No findings were identified.

c. Conclusion

Based upon the review of activities to implement requirements for the quality assurance records, the inspectors concluded that the activities relate to the above section of the inspection procedure conformed to the applicable regulatory requirements.

Q.1.15 10 CFR 50, Appendix B, Criterion XVIII, Audits (Inspection Procedures 35060, 35061, 35960)

a. Inspection Scope

Background: An NRC assessment of this element of the construction project quality assurance program was most recently documented in integrated inspection report 05000391/2012610 (ADAMS accession number ML13035A201). The report

documented that the requirements for periodic review under inspection procedures 35060, 35061, and 35960 were satisfactorily completed.

Inspection Activities: The inspectors performed a review of TVA and Bechtel audit related procedures and program documents to determine the effectiveness and to verify compliance with the applicable aspects of each organization's quality assurance program. Inspectors also reviewed applicant and Bechtel master audit schedules to verify that each organization's quality assurance audit program encompassed internal and external organizations and functions, and were implemented with diverse scopes and defined frequencies.

The inspectors sampled and reviewed five TVA audits and five Bechtel audits to verify that the organizations audit records provided objective evaluation of quality related practices, procedures, and work areas. A sampling of corrective actions associated with the audits was also reviewed to verify that the actions associated with the corrective actions were adequately implemented. Inspectors also reviewed the management reporting requirements to verify that proper levels of management were provided the results of the audits.

Documents reviewed are listed in the attachment.

The following inspection procedure sections applicable to Criterion XVIII were inspected:

- IP 35060, Section 02.03 and 02.05
- IP 35061, Section 02.01
- IP 35960, Section 02.06

b. Observations and Findings

No findings were identified.

c. Conclusion

Based on the review of the documentation samples, the inspectors concluded that the activities related to the above sections of the inspection procedures conformed to the applicable regulatory requirements.

Q.1.16 Inspection Procedure 35060, Licensee Management of QA Activities

a. Inspection Scope

This section documents the closure of Inspection Procedure (IP) 35060.

b. Observations and Findings

No findings were identified.

Inspection Procedure	Status	Documented Reports
IP 35060 – Sections 02.02 a, b, and c; 02.03 a and b;	Closed	05000391/2008006 (ADAMS accession number

02.04 a, b, c, and d; and 02.05 a and b		ML081210735), 2008009 (ADAMS accession number ML 083050404), 2010603 (ADAMS accession number ML102170465), 2012610 (ADAMS accession number ML13035A201), and 2013609

c. Conclusion

Based on the review of WBN Unit 2's QA Program through IP 35060, the inspectors concluded that the activities inspected under this IP conformed to the applicable regulatory requirements. IP 35060 is closed; however, if substantial changes to the QA Program are identified through observation of future work activities, the inspectors will inspect those as necessary to satisfy the requirements in this IP.

Q.1.17 Inspection Procedure 35061, In-Depth QA Inspection of Performance

a. Inspection Scope

This section documents the closure of IP 35061.

b. Observations and Findings

No findings were identified.

Inspection Procedure	Status	Documented Reports
IP 35061 – Sections 02.01 a, b, c, d, e, f, and g; and 02.02	Closed	05000391/2008009 (ADAMS accession number ML083050404), 2008010 (ADAMS accession number ML090291033), 2010605 (ADAMS accession number ML110410680), 2012610 (ADAMS accession number ML13035A201), and 2013609

c. Conclusion

Based on the review of WBN Unit 2's QA Program through IP 35061, the inspectors concluded that activities inspected under this IP conformed to the applicable regulatory requirements. IP 35061 is closed; however, if substantial changes to the QA Program are identified through observation of future work activities, the inspectors will inspect those as necessary to satisfy the requirements in this IP.

Q.1.18 Inspection Procedure 35065, Procurement, Receiving and Storage

a. Inspection Scope

This section documents the closure of IP 35065.

b. Observations and Findings

No findings were identified.

Inspection Procedure	Status	Documented Reports
IP 35065 – Sections 02.01 a, and b; and 02.02 a, b, c, d, e, f, g, h, and i	Closed	05000391/2010602 (ADAMS accession number ML101230144), 2010603 (ADAMS accession number ML102170465), 2011607 (ADAMS accession number ML112730134), 2012610 (ADAMS accession number ML13035A201), and 2013609

c. Conclusion

Based on the review of WBN Unit 2's QA Program through IP 35065, the inspectors concluded that the activities inspected under this IP conformed to the applicable regulatory requirements. IP 35065 is closed; however, if substantial changes to the QA Program are identified through observation of future work activities, the inspectors will inspect those as necessary to satisfy the requirements in this IP.

Q.1.19 Inspection Procedure 35100, Review of QA Manual

a. Inspection Scope

This section documents the closure of IP 35100.

b. Observations and Findings

No findings were identified.

Inspection Procedure	Status	Documented Reports
IP 35065 – Sections 02.01; 02.02; 02.03; 02.04; 02.05; 02.06; 02.07; 02.08; 02.09; 02.10; and 02.11	Closed	05000391/2008006 (ADAMS accession number ML081210735), 2010603 (ADAMS accession number ML102170465), and 2013609

c. Conclusion

Based on the review of WBN Unit 2's QA Program through IP 35100, the inspectors concluded that the activities inspected under this IP conformed to the applicable regulatory requirements. IP 35100 is closed; however, if substantial changes to the QA Program are identified through observation of future work activities, the inspectors will inspect those as necessary to satisfy the requirements in this IP.

Q.1.20 Inspection Procedure 35960, Quality Assurance Program Evaluation of Engineering Organization

a. Inspection Scope

This section documents the closure of IP 35960.

b. Observations and Findings

No findings were identified.

Inspection Procedure	Status	Documented Reports
IP 35065 – Sections 02.01; 02.02; 02.03; 02.04; 02.05; and 02.06	Closed	05000391/2008006 (ADAMS accession number ML081210735), 2008009 (ADAMS accession number ML083050404), 2008010 (ADAMS accession number ML090291033), 2012610 (ADAMS accession number ML13035A201), and 2013609

c. Conclusion

Based on the review of WBN Unit 2's QA Program through IP 35960, the inspectors concluded that the activities inspected under this IP conformed to the applicable regulatory requirements. IP 35960 is closed; however, if substantial changes to the QA Program are identified through observation of future work activities, the inspectors will inspect those as necessary to satisfy the requirements in this IP.

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

C.1.1 Pipe Support (Snubber) Work Observations (IP 50090)

a. Inspection Scope

The inspectors observed the following dynamic pipe support (snubber) installations and reviewed the as-built records to verify that the work activities relative to dynamic pipe support systems were completed in accordance with NRC requirements, and the applicant's approved procedures:

- WBN-2-PD-SNUB-062-0187, a snubber associated with the chemical volume and control system
- WBN-2-PD-SNUB-063-0217, a size PSA-3 snubber associated with the safety injection system

The inspectors observed the snubber installations to verify the support was free of damage and corrosion, pre-installation checks were completed, correct materials were used, extension rods and connecting joints were not deformed, the snubbers were installed with the correct pin to pin and cold set points in accordance with the design specifications, and M&TE was properly controlled and calibrated. Design and installation records were reviewed to verify that the design inputs, to include field changes and vendor specifications, were properly translated to the field installation procedures, and that the pipe support installation was completed in accordance with the approved drawing and design specifications.

The following samples were inspected:

- IP 50090 Section 02.03.c - two samples

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The installations of the dynamic supports (snubbers) were completed in accordance with the approved drawings and procedures.

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

a. Inspection Scope

The inspectors observed parts of the foreign object search and retrieval (FOSAR) activities on SG 2. The inspections included observations of a mock-up, on-site machining, foreign object removal, and cleaning activities. In addition, the inspectors reviewed the Westinghouse engineering evaluation, WBT-TVA-2490, “Skewed Penetration Machining Chips Evaluation PIN 6.6.3-015,” dated August 29, 2013. The inspections were completed to verify that precautions were taken to maintain the integrity of the SG 2, that the applicant’s inspections and engineering evaluation of the wear times for the SG tubes were adequate, and to determine whether work instructions were adequate and being followed.

As part of the SG 2 machining, the inspectors observed the nondestructive examination (NDE) liquid penetrant (PT) examination activities associated with the foreign object removal, to verify the examinations were completed in accordance with procedure GQP 9.7, “Solvent, Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding,” Rev. 15. The inspectors reviewed two PT

examination records for SG 2 to determine whether the reports, evaluation data, and results were in accordance with approved procedures and ASME B&VP code 1971 edition through 1973 summer addenda.

In addition, the inspectors observed the alignment for the 2B containment spray pump. The inspection was completed to verify the pump was aligned in accordance with N3602, "Installation of Rotating Equipment," Rev. 3, the approved vendor manual specifications, and that M&TE was properly controlled and calibrated.

Documents reviewed are listed in the attachment.

b. Observations and Findings

The following severity level (SL) IV non-cited violation was identified.

Introduction: The NRC identified a severity level (SL) IV non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow procedures. Specifically, a fastener utilized to retain a plug internal to the number two SG was tightened outside of the approved work process by a job-site supervisor unfamiliar with the torque wrench's operation, such that the subsequent quality control verification step did not identify a fastener tightened in excess of the design torque value.

Description: On October 24, 2013, inspectors reviewed ongoing work associated with the installation of a plug into the wrapper barrel of SG 2 as described in WO 115097433. This installation activity required QC to witness the torquing of the plug fastener to within a vendor specified range of 60 in-lbs to 80 in-lbs. In the course of the inspection, the inspectors observed personnel place a torque wrench on the plug fastener and torque the fastener without a QC or authorized nuclear inspector (ANI) being present to witness the actual torque applied. Additionally, no oversight was provided for this work by the QA organization. The inspectors observed personnel using the wrench beyond its set point of 80 in-lbs, resulting in over-torquing of the plug fastener. The type of torque wrench utilized did not capture the maximum torque value applied, leaving the fastener torqued to an unknown value.

The inspectors determined that the applicant's actions outside of approved work instructions were a performance deficiency. This performance deficiency was considered more than minor in accordance with Inspection Manual Chapter (IMC) 2517, Appendix C because it was similar to an example in IMC 0613, Appendix E "Examples of minor construction issues." Example 21 of IMC 0613, Appendix E represents a more than minor example where the licensee bypassed a QC holdpoint in a procedure and the QC inspection attribute could not be verified at a later point in the construction process. This example was similar to the performance deficiency identified because personnel were observed placing a torque wrench on the plug fastener and torqueing the fastener without QC or ANI present to witness the actual torque applied. Based on the applicant's initial assessment, it was determined that the as-installed condition of the plug could not be evaluated by engineering for acceptability because the actual torque value applied to the plug fastener could not be verified. Because the plug fastener could not be accepted as-is, it was replaced. The finding was determined to be of very low safety significance in accordance with Section 6.5 of the NRC Enforcement Policy because it is does not represent a breakdown in the QA process. The applicant issued

PER 800044, and the responsible contractor initiated nonconformance report (NCR) 905601-01, to address the identified conditions. The inspectors reviewed this finding against cross-cutting area components as described in Inspection Manual Chapter (IMC) 0310 "Components Within the Cross-Cutting Areas". The failure of the applicant to ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety was supported reflected the procedural aspect of the Work Practices component within the Human Performance area [H.4(c)]. This aspect applies, because without appropriate oversight present to observe the torquing of the fastener, the actual torque value could not be determined and therefore the plug was in an indeterminate condition.

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." Step 9.2.8.b of WO115097433, required that the plug be torqued within 60-80 in-lbs, and that QC shall witness the torque.

Contrary to the above, on October 24, 2013, the applicant failed to install a plug into the wrapper barrel of SG 2 in accordance with WO 115097433. Specifically, the NRC witnessed personnel applying excessive torque to the plug fastener outside of the work instruction. Additionally, QC was not present during the activity and failed to verify whether the actual torque value was within the specified torque range.

Because this was a SL IV violation and it was entered into the applicant's corrective action program as PER 800044, 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 05000391/2013609-01, "Over-Torquing of Steam Generator Plug Fastener."

c. Conclusions

With the exception of the above example, the observed foreign object removal process associated with the refurbishment of SG 2 and the NDE activities were completed in accordance with the approved procedures, and the records reviewed were in compliance the ASME B&VP code 1971 edition through 1973 summer addenda.

C.1.3 Piping – Piping Work Observation (Inspection Procedure 49063)

a. Inspection Scope

The inspectors observed safety-related piping hydrostatic tests for system 074, residual heat removal piping, and system 063, safety injection piping, that is cross connected to system 074. The hydrostatic test boundary included system 074 piping from 2-RVCV-74-24 miniflow piping through the main 2B residual heat removal (RHR) pump piping to 2-FVC-74-521. In addition, the hydrostatic test boundary included system 063 piping from 2-FCV-63-73 through the main 2B RHR pump piping to 2-FCV-74-521. The inspections were conducted to verify the tests were completed in accordance with procedure 25402-000-GPP-0000-N3506, "Pressure Testing of Piping, Tubing and Components," Rev. 9, and that test acceptance criteria were observed and recorded in accordance with the test procedure. In addition, the inspectors interviewed QC personnel and reviewed the training records for the test directors to verify the personnel

completing the test and inspections were qualified and knowledgeable of the procedure requirements. Also, the inspectors reviewed M&TE calibration records for the test pressure gauges to verify that M&TE was labeled to indicate the due date, or interval of the next calibration, and were uniquely identified to provide traceability to its calibration data.

The inspectors also observed safety-related piping hydrostatic tests for system 063, safety injection. The hydrostatic test boundary included system 063 piping from pumps 63-PMP-10-A and 63-PMP-15-B to flow control valves 2-FVC-63-157, 2-FVC-63-22, 2-FVC-63-156, and 2-FVC-63-3. WO 111138389, including the completed test data sheets, were reviewed to verify the tests were completed in accordance with procedure 25402-000-GPP-0000-N3506, "Pressure Testing of Piping, Tubing and Components," Rev. 10, and the test acceptance criteria were observed and recorded in accordance with the test procedure. In addition, the inspectors interviewed QC personnel and the test directors to verify the personnel completing the test and inspections were knowledgeable of the procedure requirements. Also, the inspectors reviewed M&TE calibration records for the test pressure gauges to verify that M&TE was labeled to indicate the due date, or interval of the next calibration, and were uniquely identified to provide traceability to its calibration data.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the hydrostatic tests were completed in accordance with the approved procedures and the test acceptance criteria were met.

P.1 Pre-Operational Activities

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

a. Inspection Scope

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

- System 072, containment spray

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

- General plant/equipment conditions;

- Plant areas for fire hazards; examined fire alarms, extinguishing equipment, actuating controls, fire fighting equipment, and emergency equipment for operability; verified that ignition sources and flammable material were being controlled in accordance with applicant's procedures
- Activities in progress (e.g., maintenance, preoperational testing, etc.) were being conducted in accordance with licensee's procedures;
- Watched for abuse of installed instrumentation such as stepping or climbing on the instrumentation that could affect the calibration or ability to function;
- Listened for the public address system announcements to determine that blind spots did not exist; i.e., cannot be heard clearly enough to be understood;
- Construction work force authorized to perform activities on systems or equipment;
- Openings were controlled in previously cleaned or flushed systems or components. Verified that cleanliness controls established during flushing have not been invalidated; and
- Reviewed log books maintained by the test group to identify problems or plant activities that may be appropriate for additional follow-up; determine that deficiencies identified by individual engineers were entered on a controlled list

In addition, the inspectors witnessed the performance of component test procedures GTE-04, “Coupled/Uncoupled Motor run-In Test,” Rev. 3, for the 2B containment spray uncoupled motor run; and GTE-11, “Motor Operated Valve/Damper Test,” Rev. 5, for 2-FVC-070-0153-B (MOVATs test). The inspections were completed to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The inspectors performed the following activities associated with these test observations:

- All test personnel were on station and had the latest revision of the procedure;
- Plant systems were in service to support the test;
- Testing equipment was installed and within calibration;
- Testing was performed in accordance with the approved procedure;
- Testing events and discrepancies were properly documented;
- Testing was executed and coordinated properly;
- Data was properly collected; and
- Testing personnel were using approved drawings and vendor manuals

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

The inspectors conducted interviews and reviewed training records for the test director involved in the pump decoupled motor run test to verify they had received appropriate training for performing the test in accordance with procedural requirements.

02.02 (Monthly Inspection Activities): During this inspection period, the inspectors reviewed the turnover package for the Unit 2 portion of the Essential Raw Cooling Water

system (System 67) as part of Startup Manual Procedure (SMP) 4.0, "System Completion and Turnover," Rev.9, to verify jurisdiction controls were appropriate and applicant procedures were followed. Additionally, the inspectors reviewed the turnover package to ensure required preventative maintenance was incorporated into a schedule for accomplishment.

The inspectors reviewed maintenance plans on safety-related equipment, to determine if the maintenance was scheduled in accordance with developed procedures and that these procedures were adequate for the maintenance being performed. The maintenance had not been performed but the methodology was discussed with the Refurbishment and Preventative Maintenance Manager to determine how systems with completed preoperational testing would be protected.

Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The applicant's implementation of the preoperational test program and the 2B containment spray component test was implemented in accordance with procedures for those activities observed.

P.1.2 (Discussed) Preoperational Test Procedure Review (Inspection Procedures 70300 and 70311)

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

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

IMC 2513 defines the minimum inspection program for a finding of readiness for license issuance (IP 94300, Status of Plant Readiness for an Operating Licensee). IMC 2513 requires the procedural review of the mandatory tests defined in IMC 2513 and five of the primal tests defined in IMC 2513. The following inspection was performed in relation to satisfying the required procedural review.

Inspection Activities: The inspectors reviewed pre-operational test procedure 2-PTI-067-03 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure
- the cover page had appropriate information and approval signatures
- each page had appropriate identification information

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

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

b. Observations and Findings
No findings were identified.

c. Conclusions
The inspectors determined that the applicant's test procedure was written in a manner consistent with the guidance of procedure SMP-8.0, "Watts Bar Nuclear Plant Unit 2 Administration of Preoperational Test Instructions," Rev. 9. A review of the revised test procedure should be performed to ensure that any of additional acceptance criteria is complete.

IV. OTHER ACTIVITES

OA.1.1 (Discussed) Generic Letter 2006-03: Potentially nonconforming HEMYC and MT fire barrier configurations; Bulletin No. 1992-01: Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage; Bulletin No. 1992-01 (Supplement 1): Failure of Thermo-Lag 330 Fire Barrier System to Perform Its Specified Fire Endurance Function; Generic Letter 1992-08: Thermo-Lag 330-1 Fire Barriers (Inspection Procedure 35007)

a. Inspection Scope
Background: Generic Letter (GL) 2006-03 informed licensees of required actions to address issues related to electrical raceway fire barrier system (ERFBS) material that was installed and relied upon for separation and/or safe shutdown purposes to satisfy

applicable regulatory requirements. GL 92-08 informed licensees of failures in fire barrier system endurance and ampacity derating tests, installation procedures, and as-built configuration discrepancies associated with the Thermal Science, Incorporated (TSI), St. Louis, Missouri, Thermo-Lag 330-1 ERFBS that was installed to protect safe shutdown capability. The NRC initiated a series of small scale fire tests for a sample of ERFBS and issued the results of the TU Electric and NRC fire tests in Bulletins 92-01, "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free form Fire Damage," June 24, 1992, and 92-01 Supplement 1, "Failure of Thermo-Lag 330-1 Fire Barrier system to Perform its Specified Fire Endurance Function," August 28, 1992. NRC inspection report (IR) 05000391/20130615 (ADAMS accession number ML13162A775) describes additional background information, Unit 1 and Unit 2 corrective actions, and initial NRC inspection activities of the Unit 2 engineering design methodology, to address the ERFBS historical issues.
Inspection Activities: The inspectors reviewed the work procedures and observed the ERFBS thermo-lag 330-1 material installations and for conduits 2PLC584 and B2PLC585B to verify that the installation activities were completed in accordance with G-98, "Installation, Modification, and Maintenance of Electrical Raceway Fire Barrier Systems," revision 9 and the approved drawings. The inspectors also reviewed ampacity de-rating, combustible loading, and seismic loading calculations to verify that the addition of the thermo-lag material to the conduits were included in the revised design analysis, were adequate and completed in accordance with the approved procedures. In addition, the inspectors reviewed the thermo-lag 330-1 material test reports to verify the material density and shear strength test results were in compliance with the design requirements.
Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The thermo-lag fire barrier material installations were installed in accordance with the approved procedures, and the design controls were in place to incorporate the additional material with regards to the electrical ampacity, structural supports, and fire loading area.

OA.1.2 (Discussed) Historical 10CFR21 Reviews (Inspection Procedure 92701)

a. Inspection Scope

The applicant committed to perform a review of historical 10 CFR Part 21 (Part 21) issues that were applicable to WBN Unit 1 for applicability and potential resolution for WBN Unit 2. The review process was captured in applicant procedure 25402-3DP-G04G-00501, "Historical Document Review Process" and subsequently expanded upon in applicant PER 494917. The procedural guidance utilizes a review of all issues documented in the applicant's historical database (Watts Bar Nuclear Plant Unit 2 Startup Integration Task Equipment List (WITEL)) and PER 494917 outlined the methodology the applicant planned to use to quantify, qualify, and subsequently resolve issues identified from historical Part 21's. The inspectors reviewed the procedure, assessed the methodology of the review, and performed an independent verification of

the applicants historical Part 21's results to ensure that the review encompassed all applicable historical issues. Additionally, the inspectors held interviews with applicant staff to understand the rationale for screening historical Part 21's for applicability to WBN Unit 2.

b. Observations and Findings

Introduction: The inspectors identified an Unresolved Item (URI) associated with the accuracy of the review of the historical documents contained in the applicant's WITEL database.

Description: The review of PER 494917 revealed that the applicant's intention was to "obtain a listing of all 10CFR Part 21 issues applicable to Unit 1, perform a review for Unit 2 applicability, and assign the Unit 2 applicable 10CFR21 issues to the appropriate Unit 2 design discipline." The inspectors performed an independent sample of historical items in the WITEL database and identified additional WBN Unit 1 Part 21's which were not identified by the applicant as well as WBN Unit 2 applicable Part 21's with inadequate justification for closure for WBN Unit 2. Specifically, the inspectors reviewed the 11 items the applicant screened as applicable to WBN Unit 2 and, through additional searches within the WITEL database, identified the total population of potentially applicable items as approximately 46. Along with this disparity in population was the rationale for closure of some items that were classified as applicable. Because the applicant was not aware of these items, they had not been evaluated for applicability to Unit 2. In response to the observations within this URI, the applicant has issued PER 806990 to perform an additional review of the WITEL database for potentially applicable items to WBN Unit 2 and identify any of necessary corrective actions.

Further review is needed to address the issue of concern as defined by IMC 0612, "An issue of concern about which more information is required to determine (a) if a performance deficiency exists, (b) if the performance deficiency is More-than-Minor, or (c) if the issue of concern constitutes a violation. Such a matter may require additional information from the licensee or cannot be resolved without additional guidance, or clarification/interpretation of the existing guidance." The following items will be reviewed to address the URI:

1. Review the actions associated with PER 806990;
2. Perform an independent verification of the WITEL database screening for applicability to WBN Unit 2;
3. Evaluate the corrective actions associated with those items applicable to WBN Unit 2; and
4. Review/observe additional field work, as necessary

This unresolved item is identified as URI 05000391/2013609-02, Potential Inadequate Corrective Actions for Historical Issues.

c. Conclusions

The inspectors could not draw a conclusion at the time of the inspection report period.

OA.1.3 (Discussed) Temporary Instruction 2515/120, Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22 (Temporary Instruction 2515/120)

a. Inspection Scope

Background: On July 21, 1988, the NRC amended 10 CFR Part 50 to include 10 CFR 50.63, "Loss of All Alternating Current Power," known as the station blackout (SBO) rule. The SBO rule requires that each light-water-cooled nuclear power plant be able to withstand and recover from an SBO of a specified duration. The SBO rule also requires licensees to submit information as defined in 10 CFR 50.63 and to provide a plan and schedule for conformance to the SBO rule. The NRC staff issued a safety evaluation (SE), dated March 18, 1993, and a supplemental SE, dated September 9, 1993 (ADAMS Accession Nos. ML073200313 and ML073200358, respectively), which concluded that TVA's response to the SBO rule was acceptable for both WBN Unit 1 and Unit 2. Although the staff issued an SE for both units, TVA did not seek an operating license for Unit 2 at that time. The NRC staff requested that TVA update or validate the original information or provide a new response addressing how WBN Unit 2 meets the SBO rule. The NRC staff issued SE report as supplement 22 to NUREG0847 (ADAMS Accession No. ML110390197), dated January 2011, addressing updated information regarding TVA's implementation of the SBO rule.

The purpose of Temporary Instruction (TI) 2515/120 was to verify through inspection the adequacy of applicant programs, procedures, training, equipment and systems, and supporting documentation for implementing the SBO rule.
Inspection Activities: The inspectors conducted walkdowns, reviewed drawings, procedures, and calculations, and performed inspections as appropriate for selected plant areas of importance to the SBO rule. Specifically, the inspectors performed the following:

- Reviewed the emergency diesel generator (EDG) battery sizing calculation, WBNEEBMSTI110062, Rev. 28, to verify that at least two field flashings were considered in the battery sizing calculation;
- Reviewed AOI-40 to ensure one EDG start attempt was reserved for the end of the SBO coping period;
- Reviewed condensate storage tank (CST) drawings to verify CST capacity is consistent with that discussed in the SE and that no credit is taken for the volume below the suction connections;
- Reviewed 0-AOI-8, Rev. 0, to verify implementation of site-specific procedures for preparing the plant for severe weather conditions to reduce the likelihood and consequences of a loss of offsite power (LOOP) and to reduce the overall risk of an SBO event;
- Reviewed AOI-40, to verify procedural guidance for restoration of shutdown alternating current power via the EDGs or backfeed from the 500-kilivolt system;
- Reviewed the applicant's SBO coping evaluation, EPMMA041592, Rev. 19, to verify TVA addressed the effects of a loss of ventilation during an SBO event at WBN Unit 2; and

- Reviewed NETP-100, Emergency Diesel Generator Reliability Program, Rev. 3, to verify that Watts Bar utilized an EDG target reliability of 0.975 and that current reliability data indicates that the EDGs were meeting that goal.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

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

OA.1.4 (Discussed) Bulletin 88-09: Thimble Tube Thinning in Westinghouse Reactors (IP 35007)

a. Inspection Scope:

Background: TVA committed by letter dated March 11, 1994 (ADAMS Accession Number ML073241193), for both units to establish a program and to inspect the thimble tubes during the first refueling outage. This was established for Unit 1 by DCN 39481 and through revision of Maintenance Instruction MI-94.004 to perform eddy current testing every refueling outage. This item was identified as closed in SER 16 (ADAMS Accession Number ML073450552), Appendix EE, page 10. TVA tracked this item in its Framework Letter ADAMS Accession Number ML110210486) and Status of Generic Communications (Enclosure 3) for Unit 2 with a status of "CI," indicating they considered this item closed awaiting implementation.

However, as restart for Unit 2 proceeded, TVA, in conjunction with its vendor Westinghouse, developed EDCR 52321. This EDCR was issued to install the Westinghouse In-Core Information, Surveillance, and Engineering (WINCISE) system, which employs a fixed in-core detector as opposed to the traditional moveable core detector utilized on Unit 1. Westinghouse has analyzed the new system to exhibit essentially no wear due to vibrations through its higher natural frequency and lower vibration amplitude. Additionally, Westinghouse notes that the new In-Core Instrument Thimble Assemblies (IITAs) rely on a Seal Table Swagelok fitting to ensure that even if there is a full penetration wear hole in the IITA outer sheath, there would be no direct loss of reactor coolant pressure boundary integrity into the containment building environment outside of the primary sump recirculation loop. Consequently the applicant has determined that issues addressed in NRC Bulletin (BL) 88-09 do not apply to the WINCISE system.

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

- Reviewed the applicant's final closure package
- Interviewed engineering and management personnel for both TVA and Westinghouse familiar with the WINCISE system design and installation
- Reviewed proprietary design drawings
- Reviewed system literature

b. Observations and Findings:

No findings were identified.

c. Conclusions:

Based on a review of the applicant's final closure package, the inspectors concluded that the applicant has altered the design to a fixed-probe monitoring system. As these systems were not subject to a bulletin for thinning concerns, the applicant's approach that the bulletin is no longer valid appears to have merit. However, additional review of future documentation may be performed to fully understand the applicability of the BL.

OA.1.5 (Closed) Inspector Follow-up Item 391/86-14-05: Installation of Springnuts in Unistrut (Inspection Procedure 52053)

a. Inspection Scope

Background: As documented in Inspection Report Numbers 50-390/86-14 and 50-391/86-14 (ADAMS accession number ML072500283), during a visual inspection of rework activities on instrumentation lines, inspectors noted that instrumentation devices were being fastened to supports with unistrut and springnuts. Springnuts are designed with a recessed knurled groove which fits into a lip on the unistrut and provides a locking feature to prevent slippage. At that time the inspector noted that several installed springnuts failed to be properly seated in the lip of the unistrut. Based on the inspector's observations, engineering personnel performed a walkdown and identified other areas where similar conditions existed. In 1989, the licensee initiated Construction Deficiency Report (CDR) 50-390/89-11 for Unit 1 to identify a significant deficiency pertaining to hardware found to be damaged, loose, and/or missing subsequent to QC inspection and acceptance. CDR 50-390/89-11 was closed in Inspection Report Numbers 50-390/94-35 and 50-391/94-35. A CDR was never issued for Unit 2 and IFI 391/86-14-05 remained open.

Inspection Activities: In order to close IFI 391/86-14-05 for Unit 2, inspectors performed a review the licensee's walkdown procedures used for documenting existing conditions of Seismic Category I and I(L) piping and pipe supports. These procedures were used for documenting existing conditions prior to the re-start of Unit 2 construction and were reviewed to ensure critical aspects related to the installation of springnuts in unistrut were properly addressed. Inspectors also reviewed current procedures and QC inspection attributes to ensure that the previously identified conditions were properly addressed. In addition, QC inspectors were interviewed to ensure that they understood the installation and inspection requirements. Finally, inspectors performed an

independent walkdown of portions of the Residual Heat Removal, Containment Spray, Component Cooling Water and Safety Injection Systems to ensure that there were no improperly installed springnuts identified.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Based on these actions, the inspectors determined that IFI 391/86-14-05 is closed.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

An exit meeting was conducted on November 21, 2013, to present inspection results to Mr. Hruby and other members of your staff. The inspectors identified that no proprietary information had been received during the inspection and none would be used in the inspection report. The applicant acknowledged the observations and provided no dissenting comments.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

R. Bull, M&TE Control, Bechtel
K. Cawood, M&TE Control, Bechtel
D. Charlton, III, Regulatory Compliance, TVA
T. Krach, Warehouse Supervisor, Bechtel
K. Leko, Procurement Buyer, Bechtel
K. Love, Project Engineer, Bechtel
T. Misty, Quality Assurance Administrator, Bechtel
J. Martin, Quality Manger, Bechtel
D. Myers, Senior Advisor for Quality Assurance, TVA
M. Presley, QA Records, Bechtel
D. Swaney, Supplier Quality, Bechtel
C. Vaux, Quality Assurance Specialist, TVA
J. O'Dell, TVA - Regulatory Compliance
M. McGrath, TVA – Licensing
G. Scott, TVA – Licensing
N. Welch, TVA - Properational Startup Manager
O. J. Zeringue, General Manager Engineering and Construction
R. Baron, TVA – QA Manager
D. Charlton, TVA – Licensing
J. Fisher, TVA – Licensing
B. Gillham, TVA - Licensing
R. Phillips, Senior Metallurgical Engineer, Bechtel
H. Baldner, Licensing, TVA, Unit 2
R. Hruby, General Manager

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction and Pre-Construction Activities
IP 37002	Construction Refurbishment Process - Watts Bar Unit 2
IP 35060	Licensee Management of QA Activities
IP 35061	In-Depth QA Inspection of Performance
IP 35065	Procurement, Receiving, and Storage
IP 35100	Review of QA Manual
IP 35960	QA Program Evaluation of Engineering Organization
IP 52053	Instrument Components and Systems - Work Observation
IP 49063	Piping – Work Observation
IP 50073	Mechanical Components – Work Observation
IP 50090	Pipe Support and Restraint Systems
IP 52053	Instrument Components and Systems – Work Observation
IP 64053	Fire Loop Installation
IP 70300	Preoperational Test Procedure Review
IP 70311	Preoperational Testing Procedure Verification
IP 71302	Preoperational Test Program Implementation Verification
IP 92701	Follow-up
TI 2512/120	Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u>		
05000391/2013609-02	URI	Potential Inadequate Corrective Actions for Historical Issues (Section OA.1.2)
<u>Opened and Closed</u>		
05000391/2013609-01	NCV	Over-Torquing of Steam Generator Plug Fastener (Section C.1.2)
<u>Closed</u>		
35060	IP	Licensee Management of QA Activities (Sections Q.1.16)
35061	IP	In-Depth QA Inspection of Performance (Sections Q.1.17)
35065	IP	Procurement, Receiving, and Storage (Sections Q.1.18)
35100	IP	Review of QA Manual (Sections Q.1.19
35960	IP	QA Program Evaluation of Engineering Organization (Sections Q.1.20)
391/86-14-05	IFI	Installation of Springnuts in Unistrut (Section OA.1.4)

Discussed

70300	IP	Preoperational Test Procedure Review (Section P.1.2)
70311	IP	Preoperational Test Procedure Verification (Section P.1.2)
06-03	GL	Potentially nonconforming HEMYC and MT fire barrier configurations (Section OA.1.1)
92-01	BL	Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage (Section OA.1.1)
92-01 Supp. 1	BL	Failure of Thermo-Lag 330 Fire Barrier System to Perform Its Specified Fire Endurance Function (Section OA.1.1)
92-08	GL	Thermo-Lag 330-1 Fire Barriers (Section OA.1.1)
92701	IP	Historical 10CFR21 Reviews (Section OA.1.2)
2515/120	TI	Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22 (Section OA.1.3)
88-09	BL	Thimble Tube Thinning in Westinghouse Reactors (Section OA.1.4)

LIST OF DOCUMENTS REVIEWED

I. QUALITY ASSURANCE (QA) OVERSIGHT ACTIVITIES

Q.1.3 Criterion I, Organization

Bechtel's Quality Organizational Chart dated November 2013
WBN Unit 2 NC QA Functional Organization dated October 31, 2013
Bechtel Power Corporation, BQAM-ASME Section III Div 1, Addendum to Section Organization, Revision 9.
TVA Operations Organizational Chart dated November 15, 2013
TVA President and Chief Executive Officer Organizational Chart dated November 15, 2013
Nuclear Quality Assurance Plan (NQAP), TVA-NQA-PLN89-A, Rev. 28,
Bechtel Watts Bar Unit 2 Project Nuclear Quality Assurance Manual, Rev.12 dated October 25, 2013
Bechtel Watts Bar Unit 2 Project Nuclear Quality Assurance Manual, Rev.11 dated October 24, 2013
Bechtel Power Corporation, Quality Program Manuals Procedure, 2QP-Q01G-C0303, Rev 1, dated April 11, 2013
Bechtel TVA Watts Bar Nuclear Unit 2, Construction Completion Project Training Procedure, 25402-MGT-0002, Rev 11, dated August 16, 2012
Bechtel Watts Bar Nuclear Plan , Unit 2 Construction Completion Project, Materials Bechtel Receiving Procedure, EPC No.E, dated October 30, 2013
NC 1304 Independent Audit of TVA GA Activities dated September 10, 2013.
NC-WB-13-010 Bechtel QC Certification Program Assessment, dated October 23, 2013
Audit Report, BPC, BQAMs, Audit No. 25402-WBN-AR-13-002, Rev 0 dated June 3 through June 12, 2013

Q.1.4 Criterion II, Quality Assurance Program

Independent Audit of TVA QA Department Activities, Audit No. NC 1304 dated September 10, 2013
Bechtel 2012 Nuclear Quality Status Report dated April 15, 2013
Bechtel Audit Report (PNQAM) No-25402-WBN-AR-13-0001, Revision 0, dated May 14, 2013
Bechtel Audit Report (BCOI & BPC) BQAMS, No-25402-WBN-AR-13-0002, Revision 0, dated July 17, 2013
Bechtel Quality Program Reporting, No. 2QP-Q01G-C0341, Revision 1, dated April 11, 2013
Bechtel Auditor Qualification Program, No. 2QP-Q01G-C0312, Revision 2, dated April 11, 2013
Watts Bar Unit 2, Audits and Assessments, NC PP-14, Revision 9, dated September 26, 2013
Watts Bar Unit 2, Training and Qualifications of QA Personnel, NC PP-21, Revision 8, dated August 26, 2013
Bechtel TVA Watts Bar Nuclear Unit 2, Construction Completion Project Training Procedure 25402-MGT-0002, Rev 11, dated August 16, 2012
Bechtel TVA Watts Bar Nuclear Plant Unit 2, Construction Completion Project Materials Receiving, 25402-000-GPP-000-N6104, dated October 30, 2013.
Bechtel TVA Watts Bar Nuclear Plant Unit 2, Construction Completion Project Work Orders Processing, 25402-000-GPP-0000-N1206, dated October 8, 2013
Watts Bar Nuclear Plant Unit 0, Modifications/Additions Instructions, MAI-1-3, General Requirements for Modifications, Revision 16, dated May 13, 2013
TVA Watts Bar Nuclear Plan, Modifications/Additions Instructions, MAI-4.2B, Pipe Installation, Revision 10, dated June 21, 2005
Watts Bar Nuclear Plant, Cable Terminating, Splicing, and Testing for Cables Rated Up to 15, 000 Volts, MAI-3.3, Revision, 31

Q.1.5 Criterion III, Design Control

GQA-GAQG-N0002-009, Bechtel Quality Assurance Manual (BQAM) including Addenda for Watts Bar Unit 2, Revision 9, dated July 12, 2013
25402-3DP-G04G-00037, Bechtel Engineering Department Procedure Instruction, Design Calculations, Revision 12, dated July 24, 2012
30N-P05G-0001, Bechtel Registry of Personnel Authorized to Perform ASME III Code Certifying Activities for Discipline of Plant Design, Revision 6, dated May 16, 2013
30N-P05G-0001, Bechtel Registry of Personnel Authorized to Perform ASME III Code Certifying Activities for Discipline of Mechanical and Nuclear/Environmental, Revision 4, dated July 27, 2012
25402-3DP-G04G-00051, Bechtel Engineering Department Procedure Instruction, ASME Section III Design/Stress Reports, Revision 3, dated August 7, 2012
Calculation MDQ00007020090200, Component Cooling System (CCS) Pressure Drop Calculation, Revision 3, dated February 6, 2013
Calculation EDQ002999200800002, Ampacity Analysis for Unit 2 Class 1E Cable, Revision 23, dated October 15, 2013
Calculation 270019, Qualification of Pipe Support 2-70-019 to comply with NRC Bulletin 79-02/79-14, Revision 3, dated January 24, 2013
Bechtel Engineering Document Control Release (EDCR) No. 53069, Perform Internal Changes to 480V Shutdown Board 2-BD-212-B2-B, Revision A, dated March 26, 2010
Bechtel EDCR No. 52556, Modification of Pipe Supports for the Ice Condenser System (61), Revision A, dated June 12, 2010
Bechtel EDCR No. 52581, Modification of Pipe Supports for Containment Spray System (72), Revision A, dated July 09, 2010
Bechtel EDCR No. 52586, Modification of Pipe Supports for Flood Mode Boration System (84), Revision A, dated March 12, 2013
25402-3DP-G04G-00050, Bechtel Engineering Department Procedure Instruction, ASME III Design Specifications, Revision 2, dated August 27, 2012
WBNP-DS-1935-3463, Design Specification, Flexible Hose Assemblies for the Essential Raw Cooling Water System, the Component Cooling System, and the Waste Disposal System, Revision 6, dated June 19, 2013
WBNP-DS-1935-2473, Design Specification, ASME Section III, Nuclear Class 1 Piping Systems, Revision 11, dated February 1, 2012
25402-3DP-G04G-00055, Bechtel Engineering Department Procedure Instruction, ASME Section III Data Reports and Stamping, Revision 6, dated August 21, 2013
25402-3DP-G04G-00049, Bechtel Engineering Department Procedure Instruction, Engineering Specifications, Revision 3, dated August 4, 2012
TVA General Engineering Specification G-32 for Bolt Anchors Set in Hardened Concrete, Revision 23, dated December 14, 2005
25402-3DP-G04G-00046, Bechtel Engineering Department Procedure Instruction, Engineering Drawings, Revision 12, dated July 1, 2013
TVA Drawing No. 2-47W859-3, Mechanical Flow Diagram for Component Cooling System, Revision 27, dated June 28, 2013
TVA Drawing No. 2-45W751-1, Wiring Diagrams 480V Reactor MOV Board 2A1-A, Revision 7, dated October 31, 2013
TVA Drawing No. 2-45W751-7, Wiring Diagrams 480V Reactor MOV Board 2B1-B, Revision 10, dated November 6, 2013
Bechtel Drawing Revision Authorization (DRA) 52530-026, Revision 1, dated January 23, 2013 for EDCR 52530A for drawing no. 2-70-019-1, Revision 0, dated March 11, 2010
Bechtel Drawing Revision Authorization (DRA) 52918-001, Revision 1, dated October 25, 2010 for EDCR 52918 and field change request (FCR) 55165 for drawing no. 47W400-4, Revision 8, dated October 28, 2010

Bechtel Drawing Revision Authorization (DRA) 53421-311, Revision 0, dated December 1, 2009 for EDCR 53421 and drawing no. 2-45W751-1, Revision 0
Bechtel Drawing Revision Authorization (DRA) 54852-108, Revision 0, dated October 26, 2010 for EDCR 54852-A, FCR 56291-A, and drawing no. 2-45W751-1, Revision 1
Bechtel Drawing Revision Authorization (DRA) 53287-155, Revision 1, dated January 27, 2012 for EDCR 53287-A, FCR 58967-A, and drawing no. 2-45W751-1, Revision 1
Bechtel Material Requisition 25402-011-MRA-JV15-00014 for gear parts for limitorque SB-2 actuator associated with EDCR 54851
Bechtel Material Requisition 25402-011-MRA-EY00-00018 for quick disconnect associated with EDCR 52419 for system 63, Revision 1, dated October 8, 2013

Q.1.6 Criterion IV, Procurement Document Control

Annual Supplier Evaluation (ASE), ASE 2012-063 of TVA
ASE 2012-069 and ASE 2013-076 of PCI Energy Services (PCI)
ASE 2013-084 of Central Laboratories Services (CLS) for M&TE
Audit Report 86110-010-YAA-2013-00013 of CLS for M&TE
P.O. 603581 to Areva NP, Inc. for terminal board from Limitorque Division of Flowserve
P.O. 605326 to Energy & Process Corporation for stock angle iron
P.O. 605333 to Bergen-Power Pipe Supports for pipe hanger, including use of load capacity data sheet

Q.1.7 Criterion V, Criterion V, Instructions, Procedures, and Drawings

MAI-3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up To 15000 Volts, Rev. 31
WO 112395760
DRA 53421-355, Rev. 0
ICRD report 2V4479A, Rev.3
WO 115224334
ICRD report 2V4246A, Rev. 1

Q.1.8 Criterion VI, Document Control

Work Order #112395760, Low-Voltage Cable Termination
DRA 53421-355, Rev. 0
ICRD report 2V4479A, Rev.3
Work Order #115224334, Low-Voltage Cable Lift/Re-Landing
ICRD report 2V4246A, Rev. 1
MAI-3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up To 15000 Volts, Rev. 31
25402-000-GPP-0000-N6104, Materials Receiving, Rev. 8
25402-000-GPP-0000-N1206, Expedited Procedure Change, Rev. 17
25402-ADM-0001, Document Control, Rev. 13

Q.1.9 Criterion VII, Control of Purchased Material, Equipment, and Services

Printed Report from Evaluated Supplier's List, dated October 2013
Printed report of Overages, Shortages, Damage, & Discrepancy reports, dated October 2013
MRR 36357, Weld Electrodes, Component ID CNL734P

Q.1.11 Criterion X, Inspection

Work Order #112395760
DRA 53421-355, Rev. 0
ICRD report, 2V4479A, Rev.3

Work Order #115224334
ICRD report, 2V4246A, Rev. 1
Work Order #115210115
Work Order #114864637
MAI-3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up To 15000 Volts, Rev. 31
25402-000-GPP-0000-N6104, Materials Receiving, Rev. 8

Q.1.12 Criterion XII, Control of Measuring and Test Equipment

NPG-SPP-06.4, TVA Measuring and Test Equipment procedure, Revision 0, dated August 6, 2010
ID# E49717 tag, 3/8" Drive Torque Wrench, Calibration Date of 6/18/13 with due date of 6/18/14
ID# E46483 tag, Contact Surface Thermometer, Calibration Date of 9/9/13 with due date of 3/9/14
ID# E43133 tag, 500 psi Hydrostatic Pressure Gauge, Calibration Date of 8/1/13 with due date of 2/1/14, and Report of Calibration from CLS showing Test Description of 0-500 psi and 500-0 psi within calibration tolerance

Q.1.14 Criterion XVII, Quality Assurance Records

25402-011-MRI-PY00-00002, Material Receiving Instruction, Senior Flexonics flexible braided stainless steel hose assemblies, Revision 5, dated February 11, 2011
Material Receiving Report, MRR 18473 for 2" dia. flexible braided stainless steel straight length and elbows, ASME Section III, Class 2, dated October 14, 2010
Senior Flexonics Pathway, Certificate of Conformance to TVA for Flexonics Pathway 2" Flexible Hose Assembly with Serial Numbers M00288-1-1 thru M00288-1-11, Part No. 77753, ASME Section III, Class 2, dated October 6, 2010
Energy & Process Corporation, Material Certification, 2" Schedule 40 seamless pipe of SA106 Gr. B, Heat No. 364333, manufactured by Quanex (Energy Steel), ASME Section III, Class 2, dated May 19, 2010
Michigan Seamless Tube, CMTR 018685 for SA 106 Gr. B, Heat No. 00A050411, dated April 25, 2005
Bechtel Attachments C1 and C2, Pressure Test Data Sheets, for ASME Section III 140 psig pneumatic test of piping and flex hose for system 33, Control and Service Air System, dated February 21, 2003
Bechtel Pneumatic Test Package 2-033-47W846-2-2-B14, Test Boundary Map, Revision 1
ASME NPP-1 Code data report by Senior Operations, Inc. for 2" flexible hose assembly M00288-1-1 thru M00288-1-11, ASME Section III, Class 2 signed by One Beacon, ANI, dated October 6, 2010
ASME Code data report Attachment G (pneumatic test) to Partial N-5 Data Report

Q.1.15 Criterion XVIII, Audits

2013 Bechtel Master Audit Schedule, Rev. 4
2012 Bechtel Master Audit Schedule, Rev. 1
Procedure 25402-QAS-0003, Project Quality Assurance Audits and Personnel Qualifications, Rev. 8
Bechtel Project Nuclear Quality Assurance Manual, Rev. 12
Audit QSM-GAP-12-001, Quality Services Management Audit of Watts Bar Unit 2 Construction Completion Project, Rev. 0
Audit 25402-WBN-AR-13-0003, Access Authorization, Rev. 0
Audit 25402-WBN-AR-13-0002, Bechtel Construction Operations Incorporated (BCOI) and Bechtel Power Corporation (BPC) Bechtel Quality Assurance Manuals (BQAMS), Rev. 0
Audit 25402-000-YAA-2012-00001, Supplier Quality Department

Audit 25402-WBN-AR-13-0004, Underwater Engineering Services Inc., Rev. 0
Audit NC1205, ASME III Quality Assurance Manual Activities
Audit NC1204, Limited Scope Audit Of Project QA Records
Audit NC1203, Independent Audit Of Quality Assurance (QA) Department ASME Activities
Audit NC1201, Design Control And Procurement Document Control
Audit NC1304, Independent Audit Of TVA Quality Assurance (QA) Department Activities
PER 604418
PER 770322

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1.1 Pipe Support (Snubber) Work Observations

Work Orders
WO 112838331, Snubber for Support No. 062-0187

M&TE
E 46972 Torque Wrench, 2/14/14

Calculations
CEB 8580204912, Calculations for pipe Support No. 2-62A-561, Rev. 2

Miscellaneous
FCR 62306-A AA-01, 10/14/13

Documents Reviewed
Drawings
DRA 52491-178
DRA 52491-179

Calculations
WBP840406030, Calculations for pipe support No. 2-63-023

Miscellaneous
FCR 62593-A
25402-000-GPP-0000-N3504, “Pipe And Instrument Tubing Supports”, Rev. 3
MAI-4.2A, “Piping/Tubing Supports”, Rev. 0018

C.1.2 Mechanical Components – Work Observation and Construction Refurbishment Process

Work Orders
WO 115030497, SG 2 Spot Face and PT
WO 115182640, RHR Seal Machine Seal Gland
WO 115157162, WBN-2-PMP-074-0020-B Rebuild Gland Seal

Miscellaneous
PT905601-001, Spot Face PT report, 10/18/13
PT 905601-002, Bore whole PT report, 10/21/1
VTD-W120-0060, Instruction Manual for Westinghouse Containment Spray Pumps and Drivers, Rev. 5
WBN-VTD-I075-0430, Ingersoll Rand Installation, Operation and Maintenance for Residual Heat Removal Pumps, Rev. 8

M&TE
E 36928, Laser Alignment, 7/22/2014

C.1.3 Piping – Piping Work Observation

Work Orders
WO 115160064 Hydro Test Package 2-074-47W810-1-2-B2A, Rev. 0
WO 111138389, CCH SYS 063 WBN-2-PIPE-063-B Hydro Test 2-063-47W811-1-2-B7, Rev. 0

M&TE
E48168 Pressure Gauge, 3/6/2014
E48169 Pressure Gauge, 3/6/2014
E44843 Thermometer, 10/7/2014
E48069 Pressure Gauge, 12/18/2013
E50013 Pressure Gauge, 11/24/2013
E46174 Thermometer, 12/18/2013

P.1.1 Preoperational Test Program Implementation Verification

Work Orders
WO 112243540 SYS 063 2B-B Containment Spray Uncoupled Motor Run GTE-05 Test
WO 11227129 2-FCV-070-0153-B GTE-11 MOVATS test

IV. OTHER ACTIVITES

OA.1.1 (Discussed) Generic Letter 2006-03: Potentially nonconforming HEMYC and MT fire barrier configurations; Bulletin No. 1992-01: Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage; Bulletin No. 1992-01 (Supplement 1): Failure of Thermo-Lag 330 Fire Barrier System to Perform Its Specified Fire Endurance Function; Generic Letter 1992-08: Thermo-Lag 330-1 Fire Barriers

Calculations
EPMDOM012990 Combustible Load Analysis, Rev. 58
CDQ00029220113000159, Design and Evaluation of Appendix R Conduit and Supports for EDCR 55523, Rev. 0
RIMS B18910710259, Support, Hangers Support Analysis for 2-CSP-292-N2471, Rev. 0
RIMS B18910729259, Support, Hangers Support Analysis for 2-CSP-292-N1611, Rev. 0
Ampacity calc

Procedures
DS-E12.6.3, “Electrical Design Standard,” Rev. 10
WB-DC-40-31.10, “Seismically Qualifying Conduit Supports,” Rev. 11

Miscellaneous
PO544839-X, Thermo-lag 330-1 Batch F13-02011 Test Results, 6/19/2013
PO421524ITEM8, Thermo-lag 330-1 Batch F12-05003 Test Results, 9/9/2013

OA.1.3 (Discussed) Temporary Instruction 2515/120: Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22

Miscellaneous
WBNEEBMSTI110062, 125VDC Diesel Generator (DG) Control Power System Evaluation, Rev. 28
EPMMA041592, Station Blackout Coping Evaluation, Rev. 19
2-47W803-2, Flow Diagram Auxiliary Feedwater, Rev. 16

Procedures
1-AOI-40, Station Blackout, Rev. 1
2-AOI-40, Station Blackout, Rev. 0
0-AOI-8, Tornado Warning or Watch, Rev. 0
NETP-100, Emergency Diesel Generator Reliability Program, Rev. 3

OA.1.5 (Closed) Inspector Follow-up Item (IFI) 391/86-14-05: Installation of Springnuts in Unistrut

Procedures, Standards and Specifications
MAI-4.2A, Piping/Tubing Supports, Rev. 018
WCG-2-615, WBN2 Seismic Category I(L) Piping Walkthrough Screening Evaluation Guidelines, Rev. 002
WDP-PD-2, Walkdown Procedure for Piping and Pipe Supports, Rev. 9
G-43, Engineering Specification for Installation, modification, and Maintenance of Pipe Supports and Pipe Rupture Mitigation Devices, SRN-G-43-28

Closure Reports/Packages:
T02-1202224-001, PP-19 Closure Package for IFI 391/86-14-05, Installation of Springnuts in Unistrut

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
AOI	Abnormal Operating Instruction
ASME	American Society of Mechanical Engineers
B&PV	Boiler and Pressure Vessel
BL	Bulletin (NRC)
BQAM	Bechtel Quality Assurance Manual
CDR	Construction Deficiency Report
CFR	*Code of Federal Regulations*
CMTR	certified material test report
CST	condensate storage tank
EDCR	Engineering Document Construction Release
EDG	emergency diesel generator
EDMS	electronic document management system
ERFBS	electrical raceway fire barrier system
ESL	evaluated supplier list
FCR	Field Change Request
FOSAR	foreign object search and retrieval
GL	Generic Letter
IFI	inspector follow-up item
IMC	Inspection Manual Chapter (NRC)
IP	Inspection Procedure (NRC)
IR	inspection report
ITTA	In-Core Instrument Thimble Assemblies
LOOP	loss of offsite power
M&TE	Maintenance and Test Equipment
MCCs	Motor-Control Centers
MIA	materials instructions and assistance
MWR	material withdrawal requests
NCR	Non-Conformance Report
NCV	non-cited violation
NDE	Non-destructive examination
NRC	Nuclear Regulatory Commission
OSDD	overages, shortages, damage, and discrepancy
PER	Problem Evaluation Report
PT	Penetrant test
QA	Quality Assurance
QC	Quality Control
Rev.	Revision
RHR	residual heat removal
SBO	station blackout
SE	Safety Evaluation
SG	steam generator
SL	severity level
SMP	Startup Manual Procedure
TI	temporary instruction
TSI	Thermal Science, Incorporated
TVA	Tennessee Valley Authority
URI	Unresolved Item
WBN	Watts Bar Nuclear Plant
WINCISE	Westinghouse In-Core Information Surveillance, and Engineering
WO	Work Order