



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

August 13, 2010

Mr. Ashok S. Bhatnagar  
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 INSPECTION  
REPORT 05000391/2010606**

Dear Mr. Bhatnagar:

On July 2, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of construction activities at your Watts Bar Unit 2 reactor facility. The enclosed inspection report documents the inspection results, which were discussed on July 2, 2010, with Mr. Jerry Schlessel 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, with the conditions of your construction permit, and with fulfillment of Unit 2 regulatory framework commitments. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel associated with your construction refurbishment program.

Based on the samples reviewed, the inspection found that the refurbishment program was adequate to ensure all components and commodities are covered with one exception regarding those items that may not have unique identifiers which is described in the enclosed report. You had identified this area for corrective action prior to the inspection. In addition, the sample inspections of refurbishment implementation activities found these to be acceptable. Based on the results of this inspection, no findings or violations of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at

<http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). Should you have any questions concerning this letter, please contact me at (404) 997-4446.

Sincerely,

**/RA/**

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

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

Enclosure: Inspection Report 05000391/2010606 w/Attachment

cc w/encl: (See next page)

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cc w/encl: (See next page)

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4

cc email distribution w/encl:  
Greg Scott  
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Letter to Ashok S. Bhatnagar from Robert C. Haag dated August 13, 2010.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INSPECTION  
REPORT 05000391/2010606

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2010606

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: 1260 Nuclear Plant Rd  
Spring City TN 37381

Dates: June 28 – July 2, 2010

Inspectors: P. Van Doorn, Senior Reactor Inspector, Construction Projects  
Branch 3 (CPB3), Division of Construction Projects (DCP)  
Region II (RII) (Sections Q.1.1, E.1.1, E.1.4)  
A. Issa, Project Inspector, CPB3, DCP, RII (Sections Q.1.1, E.1.1,  
E.1.2, E.1.4)  
G. Khouri, Senior Construction Inspector, DCP, CPB2, RII  
(Sections E.1.1, E.1.3)  
G. Crespo, Senior Construction Inspector, Division of Construction  
Inspection (DCI), RII (Section E.1.1)  
T. Steadham, Construction Inspector, DCI, RII (Sections E.1.1,  
E.1.3)  
M. McConnell, Senior Electrical Engineer, Office of Nuclear  
Reactor Regulation (NRR) (Section E.1.1)  
P. Shemanski, Senior Electrical Engineer, NRR (Section E.1.1)

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

Enclosure

## EXECUTIVE SUMMARY

Watts Bar Nuclear Plant, Unit 2  
NRC Inspection Report 05000391/2010606

This team inspection included aspects of engineering and construction activities performed by TVA and its contractor regarding development and implementation of the construction refurbishment program. This report covered the period of June 28 – July 2, 2010. The inspection program for Unit 2 construction activities is described in NRC Inspection Manual Chapter (IMC) 2517. Information regarding the Watts Bar Unit 2 Construction Project and NRC inspections can be found at <http://www.nrc.gov/reactors/plant-specific-items/watts-bar.html>.

The inspectors concluded that TVA had established a viable program to ensure all commodities and components are covered in the refurbishment process. However, the inspection identified several observations regarding process improvements as noted below.

### Inspection Results

- Oversight activities for the refurbishment program were reviewed and determined to be thorough.
- The inspectors concluded that the program, if implemented as planned and inspection results are appropriately evaluated for possible expansion of sample size, is adequate to assure all components, structures, and commodities are scoped within the refurbishment program. One potential exception was identified by the applicant and was entered into the corrective action program.
- The inspectors noted that the program was not clear regarding the expected qualification requirements for passive inspection personnel and the process for consideration of real time field observations during construction was not well defined.
- Multiple examples were noted in completed vendor refurbishment packages where wording could lead to confusion or quality issues. No actual technical issues were noted and other steps or controls in the process would serve to assure quality.



## REPORT DETAILS

### Background

Most of the equipment at Watts Bar Unit 2 was installed during the original construction period. Since layup activities were terminated for a period of time after 2001, it is necessary to ensure the equipment is still capable of meeting its required specifications. In order to address this concern, the applicant established a refurbishment program to identify the scope of equipment in the program, and perform appropriate activities to assure design standards are met. The applicant's general program procedure for refurbishment, 25402-000-GPP-0000-TI216, Watts Bar Unit 2 Completion Project Refurbishment Program, was submitted to NRC on July 8, 2009 and reviewed by the Office of Nuclear Reactor Regulation (NRR). This resulted in issuance of the NRC Safety Evaluation Report (SER) dated July 2, 2010 (TAC No. ME1708). In general the SER review found the program to be acceptable. The general program did not specify specific components, structures, and commodities in detail to be covered. This inspection reviewed detailed scoping procedures and activities and selected actual implementation activities to confirm components, structures, and commodities were adequately covered.

### **I. Quality Assurance Program**

#### **Q.1 Quality Assurance (QA) Oversight Activities**

##### **Q.1.1 Refurbishment Self-Assessment and Problem Identification and Resolution (IP 37002)**

###### **a. Inspection Scope**

The inspectors reviewed a self-assessment and a Quality Assurance surveillance to determine if the applicant's oversight was thorough and appropriate corrective actions were initiated based on the findings. In addition, the inspectors reviewed selected Problem Evaluation Reports (PERs) to determine if appropriate corrective actions were initiated. Specific documents reviewed are listed in the Attachment.

The following samples were inspected:

- IP 37002 Section 02.01.c - 2 samples (complete)
- IP 37002 Section 02.02.f - 10 samples

###### **b. Observations and Findings**

No findings of significance were identified. The oversight activities reviewed were thorough, broad based, and self critical. A number of problems were identified by the oversight activities and corrective actions were initiated via PERs as appropriate. Although the corrective actions specified seemed reasonable, the engineering evaluations required for the more significant problems had not been completed at the time of the inspection and therefore, were not inspected. The QA surveillance identified that increased management attention was warranted for refurbishment implementation activities, however, the applicant had only recently received the report and had yet to address this observation.

### c. Conclusions

The oversight activities reviewed were thorough, broad based, and self critical. The inspection results are too limited to support a conclusion regarding corrective actions at this time.

## II. Management Oversight and Controls

### E.1 Engineering Activities

#### E.1.1 Refurbishment Scoping Inspection (IP 37002)

##### a. Inspection Scope

The inspectors reviewed various scoping documents in order to confirm that the applicant's process was sufficiently thorough to assure all systems, structures, and components (SSCs) are either included in the refurbishment process or have been justified for exclusion. In addition, the inspectors verified that the process included appropriate refurbishment activities, inspections, and tests. The inspectors selected the Auxiliary Feedwater System (AFW), some safety-related portions of the Main Feedwater System (MFW), and the injection portion of the Chemical and Volume Control System (CVCS) for the primary emphasis during this inspection. Various components and passive commodities for these systems were selected to confirm that they were covered by the process. This was performed by reviewing systems drawings and the applicant's Master Equipment List (MEL), and by walk down observations.

For passive mechanical commodities the inspectors reviewed mark up drawings and the lists of planned inspections for the above systems to confirm that the type and location of planned inspections were appropriate to evaluate the most probable degradation mechanism and to cover sufficient areas to bound the systems. Field walk downs were conducted of portions of the AFW and CVCS systems to verify inspection points and observe field conditions. Records of passive inspections performed to date on these systems were also reviewed.

For electrical and instrumentation components, the inspectors reviewed the general procedures that addressed scoping; the scoping database which had the components listed along with planned activities; the draft Environmental Qualification (EQ) master list; and selected specific component refurbishment procedures, to confirm that appropriate acceptance criteria were included. The specific component procedures included EQ procedures for electrical penetrations, electrical junction boxes, and motors; and procedures for inspection and testing of GE-HFA relays (including vendor advisories), Westinghouse DS circuit breakers, 6.9 KV circuit breakers, and Reactor Trip breakers. The inspectors also reviewed calculations used to analyze the effects of long term cable layup on the anticipated life expectancy. Following these reviews, the inspectors randomly selected 47 safety-related active electrical component samples from two systems, AFW and CVCS, to determine if they were all addressed by the refurbishment program. The inspectors utilized approved plant drawings, electrical equipment lists, and field walk downs to select the components. The components reviewed included time delay relays, motor control center (bucket) starters, flow switches, solenoid valves, flow transmitters, level control valves, isolation valve hand switch, level controller, level indicators, level transmitters, isolation valve motors, centrifugal charging pump motor,

pressure differential controller, pressure controllers, relays, and isolation valve transfer switches. The inspectors also reviewed work control and procurement documents to determine if each of these components had an associated work order or purchase order to perform the intended refurbishment activity or an appropriate justification where no such work or purchase order existed.

For mechanical components, the inspectors randomly selected 60 safety-related active mechanical component samples from eight systems to determine if all components and commodities were addressed by the refurbishment program. The inspectors utilized approved plant drawings, mechanical equipment lists, and field walk downs to select the components. The inspectors also reviewed work control and procurement documents to determine if each of these components had an associated work order or purchase order to perform the intended refurbishment activity or an appropriate justification where no such work or purchase order existed. Additionally, the inspectors reviewed six active mechanical components that the applicant excluded from the scope of refurbishment to determine if the basis for exclusion was justified.

The inspectors also reviewed the training plan for personnel assigned to the applicant's Maintenance Rule inspection which was credited for inspection of structures.

The inspectors held discussions with applicant personnel regarding criteria for EQ evaluations, voltage levels for main control room Westinghouse (W2) switches, relay impedance testing, blocking or motor winding support structures, inspection of broken or loose motor rotor bars, mechanical refurbishment activities, and passive inspection results.

The applicant's construction process included various walk downs to evaluate field conditions for potential refurbishment activities. The inspectors conducted independent walk downs of portions of the above listed systems to confirm conditions matched those listed by the applicant, evaluate actual field conditions for components and commodities, evaluate locations of planned passive inspections to assure these cover appropriate areas such as low points, and confirm various field observed components were covered by the process. The following electrical components were observed:

#### Electrical Penetrations

WBN-2-PENT-293-0038-D

#### Junction Boxes

WBN-2-JB-292-1428-A

WBN-2-JB-292-1410-B

WBN-2-JB-292-1967-A

WBN-2-JB-292-1409-A

#### Motors

WBN-2-MTR-003-0118D-A

WBN-2-MTR-003-0128-B

WBN-2-MTR-003-0128D-B

WBN-2-MTR-062-0104-B  
WBN-2-MTR-062-0108-A

Specific documents reviewed are listed in the Attachment.

The following samples were inspected:

- IP 37002 Section 02.01.a – (complete; no sample size is required by the IP)
- IP 37002 Section 02.01.b – 3 samples (complete)

b. Observations and Findings

No findings of significance were identified.

The inspectors noted that the program was adequate to assure all components, structures, and commodities are addressed by the refurbishment program with one potential exception. The program was not clear as to how the applicant was ensuring evaluations were performed on equipment that did not have unique identifiers and would not be listed specifically on the MEL, e.g., equipment in vendor supplied electrical cabinets and skid mounted equipment. The applicant was planning to inspect these components and had recognized the need to describe the process in more detail prior to the inspection. The applicant had initiated PER 233210 to address this area. Also, the program relies on the corrective action process to ensure negative observations are adequately addressed.

The inspectors noted that the program was not clear regarding the expected qualification requirements for passive inspection personnel and the process for consideration of real time field observations during construction was not well defined. The applicant initiated PER 237813 to address these concerns.

No significant problems were noted during the walk downs. The observations of electrical equipment showed that the applicant had accurately identified field conditions. No significant degradation was noted during the passive walk downs and appropriate inspection points were planned.

The training plan for Maintenance Rule structural inspection was thorough and appropriately tied to the applicant's procedure.

The inspectors noted that for piping supports, electrical cable, conduit, and cable tray systems; the applicant credited the established specific Corrective Action Programs (CAPs) for these areas. This was considered acceptable and these activities will be covered via the planned NRC inspections of the CAPs.

In general, the process for evaluated EQ considerations was adequate. However, two questions were raised. These involved the use of 86-degrees F as the average temperature equipment was exposed to during the layup period and the applicant's intentions to not upgrade Category 2 EQ equipment to Category 1 during the refurbishment process. These issues will be handled through the NRC licensing process.

The inspectors identified an Unresolved Item (URI) related to the temporary support of AFW suction and discharge piping. During a walk down of the AFW system, the inspectors observed that the suction and discharge piping had been disconnected when the associated pump was removed for refurbishment and the piping did not have temporary supports installed. Later, the applicant identified that WO 08-952956-001, step 4.7 required temporary supports be installed for this piping. The inspectors concluded that in order to properly evaluate and disposition this issue, additional inspection would be required to determine (1) the impact of not installing the temporary supports on the continued qualification of the piping; (2) the reason why step 4.7.1 of the WO to install the supports, was not completed; and (3) the extent of condition. This is URI 05000391/606-01, Evaluation of the Use of Temporary Supports When Equipment is Removed.

c. Conclusions

The inspectors concluded that the program, if implemented as planned and if the inspection results are appropriately evaluated for corrective action, is adequate to assure all components, structures, and commodities are addressed with one potential exception which had been identified by the applicant for corrective action.

**E.1.2 Vendor Refurbishment Implementation (IP 37002)**

a. Inspection Scope

Section 02.02.a.1 of IP 37002 requires confirming requirements are met for 8 – 10 samples of components being refurbished by vendors. Likewise, Section 02.02.a.2 of IP 37002 requires confirming requirements are met for 8 – 10 samples of components being replaced by vendors. RII staff had previously performed a comprehensive procurement, receiving and storage inspection that was documented in quarterly integrated inspection report 05000391/2010603. This inspection covered all phases of procurement activities in details and sampled many purchase orders associated with refurbishment. Examples included:

- PO 42199-2, Main Steam Safety Valves, Refurb., ASME Section III, Rev. 2
- PO 63534, Snubber, Hydraulic, QA 1, for Steam Generators, Rev. 0
- PO 80513, Diaphragm, QA 1, Order Date: 02/24/2010
- PO 87607, Limit Switch, ARMS, for Actuator, QA 2, Rev. 0

Therefore, the vendor implementation portion of the refurbishment inspection focused on reviewing complex and unique refurbishment contracts that were not covered by the previously conducted procurement inspection discussed above. The inspectors reviewed the following two contracts along with associated PERs and WOs, in detail:

- 25402-011-FC2-P409-00001, Refurbish Main Steam Isolation Valves (MSIVs), dated May 6, 2009
- CWA # PSS-WBN-2-2009-009, Revision 0, AFW Pump Motor Refurbishment

The following samples were inspected:

- IP 37002 Section 02.02.a.1 – 4 samples (2 during this inspection and 2 covered in procurement inspection)
- IP 37002 Section 02.01.a.2 – 2 samples (both covered in procurement inspection)

b. Observations and Findings

No findings of significance were identified.

Multiple examples were noted in completed vendor refurbishment packages where wording could lead to confusion or quality issues or engineering direction was obtained inappropriately. No actual technical issues were noted and other steps or controls in the process would serve to assure quality. These involved:

- A manager of Parts and Services being allowed to make engineering decisions
- Allowing a contractor to unilaterally make changes to dwgs, design, or specifications
- A reference to original design/manufacturers specifications which do not exist
- Specifying motor performance as “similar to U1” rather than per the specifications

The applicant initiated PERs 237879, 237861 to address these issues.

c. Conclusions

The inspection results are too limited to support a conclusion at this time.

**E.1.3 Active Mechanical System Components Onsite Inspection/Refurbishment (IP 37002)**

a. Inspection Scope

The inspectors selected three safety-related valves that were being refurbished on-site to determine if the completed implementation activities were appropriate. For these valves, the inspectors reviewed completed work orders to determine if the appropriate refurbishment activities occurred (such as replacing degraded lubricants, gaskets, packing, and elastomers), associated corrective actions were performed, and testing was performed or included in an established test program. Additionally, the inspectors performed field observations on four valves with active work in progress to determine if work was being performed in accordance with approved procedures and if the procedures were appropriate to the circumstances.

The inspectors reviewed three completed work orders generated by the program to determine if the records were legible, retrievable, met the applicant’s records management requirements, and reflected completed work.

The following samples were inspected:

- IP 37002 Section 02.02.b – 3 samples of one type

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspection results are too limited to support a conclusion at this time.

**E.1.4 Passive Commodities Inspection/Refurbishment (IP 37002)**

a. Inspection Scope

The inspectors selected passive piping inspection records for review. These included carbon steel and stainless steel piping in the three systems identified in Section E.1.1. The inspectors also performed field walk downs as described in Section E.1.1. In addition, the inspectors observed four field inspections of piping in the safety-related portion of the carbon steel Main Feedwater system at the following valve locations:

- 2-CKV-003-0670, Steam Generator 2 MFW Bypass Line Check
- 2-CKV-003-0669, Steam Generator 2 MFW Bypass Line Check
- 2-CKV-003-0678, Steam Generator 3 MFW Bypass Line Check
- 2-CKV-003-0679, Steam Generator 3 MFW Bypass Line Check

Specific documents reviewed are listed in the Attachment.

The following samples were inspected:

- IP 37002 Section 02.02.d – two samples (two piping environments)

b. Observations and Findings

No findings of significance were identified.

The applicant's inspections observed were thorough and no degradation was noted. The inspectors noted one component which the applicant failed to include in the program, charging pump oil reservoirs. This was considered a minor oversight since the probability of degradation was low and other means to evaluate this component existed. The applicant initiated PER 237865 for this concern.

As described in Section E.1.1, the inspectors noted that for piping supports, electrical cable, conduit, and cable tray systems; the applicant credited the established specific CAPs for these areas. This was considered acceptable and these activities will be covered via the planned NRC inspections of the CAPs.

c. Conclusions

The inspection results are too limited to support a conclusion at this time.

### **E.1.5 Record Review (IP 37002)**

#### **a. Inspection Scope**

Records were reviewed as indicated in the preceding paragraphs, which included work packages, and inspection records.

Specific documents reviewed are listed in the Attachment under the various headings.

The following samples were inspected:

- IP 37002 Section 02.02.e – 17 samples

#### **b. Observations and Findings**

No findings of significance were identified.

#### **c. Conclusions**

The inspection results are too limited to support a conclusion at this time.

### **V. Management Meetings**

#### **X.1 Exit Meeting Summary**

On July 2, 2010, the NRC inspectors presented the inspection results to Mr. Jerry Schlessel and other members of his staff. Although proprietary information was reviewed during the inspection, no proprietary information was included in this inspection report. An additional phone exit meeting was held on August 11, 2010 with Mr. Greg Scott to discuss the Unresolved Item discussed in Section E.1.1.



**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Applicant personnel

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R. Baron, Nuclear Assurance Project Manager, TVA, Unit 2  
D. Beckley, Electrical Design Manager, Bechtel  
B. Briody, Maintenance and Modifications Manager, TVA, Unit 2  
B. Crouch, Licensing Manager, Unit 2  
H. Evans, Active Refurbishment Supervisor, Bechtel  
T. Franchuk, Quality Manager, Bechtel  
E. Freeman, Engineering Manager, TVA, Unit 2  
S. Hilmes, Lead Electrical Engineer, TVA, Unit 2  
D. Malone, Quality Assurance, TVA, Unit 2  
D. Myers, Quality Assurance Manager, TVA, Unit 2  
D. Osborne, Lead Civil Engineer, TVA, Unit 2  
J. Schlessel, Construction Manager, TVA, Unit 2  
G. Scott, Licensing Engineer, TVA  
K. Welch, Passive Refurbishment Lead, Bechtel

**INSPECTION PROCEDURES USED**

IP 37002      Construction Refurbishment Process – Watts Bar Unit 2

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened

05000391/2010606-01      URI      Evaluation of the Use of Temporary Supports When  
Equipment is Removed

Closed

None

Discussed

None

## LIST OF DOCUMENTS REVIEWED

### I. Quality Assurance Program

#### Q.1.1 Identification and Resolution of Construction Problems

##### Problem Evaluation Reports (PERs)

211064, MSIV – Request for Shipment did not Agree with Material Sent to Warehouse  
 219897, Unit 2 plant modifications have the potential to be screened out  
 222584, In Process Receipt Activity: No Inspection Attributes  
 224684, Historical Issue: Clam Shells (Deceased) Found in ERCW Flow Control Valves  
 225358, ERCW Header B AFW Pump 2B-B Suction Bonnet Gasket Area Deficiency  
 225705, Historical Issue: FME in Unit 2 ERCW  
 225710, Historical Issue: Standing Water Found in ERCW Valves  
 225751, Seat Ring Retainers Were Found to be Degraded From Erosion  
 230139, Historical Issue/ASME Related: Rust Nodule Downstream of 2-CKV-63-643  
 234677, Procedure Enhancement

##### Oversight/Self-Assessment Documents

Self-Assessment of Refurbishment Program, dated May 10 – 28, 2010  
 TVA Quality Assurance Assessment Report NGDC-WB-10-002, Refurbishment Program, dated 06/18/2010

##### PERs Generated As a Result of the Inspection

237408, A WO step to notify a Design representative was not signed  
 237813, Two items for improvement for the passive refurbishment procedure were identified  
 237861; Contract allowed unilateral changes to drawings, designs, or specifications  
 237865, Scoping for the passive refurbishment program did not identify lube oil reservoirs  
 237879, Question on vendor technical direction  
 238403, Field Engineer deleted quality control block on WO  
 237830, FME covers missing and torn

### E.1 Engineering Activities

#### E.1.1 Refurbishment Scoping Inspection

##### Procedures/Programs

25402-3DP-G04G-00090, Engineering Evaluation for Commodity Refurbishment. Rev. 1  
 25402-000-GPP-0000-TI 216, Watts Bar Unit 2 Completion Project Refurbishment Program, Rev. 4  
 25402-000-GPP-0000-N1302, Component Refurbishment Evaluation, Rev. 3  
 25402-3DP-G04G-00503, Master Equipment List for system 003 Auxiliary Feed Water System and system 062 Chemical & Volume Control System, Rev. 1  
 TVA – Power Service Shops Job Instruction PSS-JI-RA-GEN.03.05 Winding Resistance Test – Revision 3, dated 10/8/2004  
 25402-000-GPP-0000-N1106, Equipment Environmental Qualification  
 25402-000-GPP-0000-N3603, Lubrication Program, Rev. 0

25402-000-GPP-0000-N3521, Enhanced Valve Packing (SR/QR), Rev. 0  
 25402-000-GPP-0000-N3525, Valve Refurbishment (SR/QR), Rev. 0  
 Refurbishment Program Equipment Scoping List, Dated 6/28/2010

### Specifications, Calculations, and Design Criteria Documents

WBNEQ-CABL-055 - EQ Change Supplement for Rockbestos Signal Cable  
 WBNEQ-ILT-002 - EQ Change Supplement for Gulton Statham Transmitters  
 WBNEQ-CABL-053 - EQ Change Supplement for Rockbestos Cable  
 Calculation sheet WBNAPS2-128 – Watts Bar Nuclear Unit 1  
 Tab A of Binder No. WBNEQ-JBOX-001 (WBN Unit 1 - Compilation methodology for Junction Boxes)  
 Draft List of 10 CFR 50.49 Components (i.e., draft master EQ list) (Calculation # WBN-EEB-EDQ00299920090011)

### Drawings

Unit 1 Flow Diagram, Chemical & Volume Control, System # 1-47W809-1, Rev. 60  
 Unit 2 Flow Diagram, Chemical & Volume Control, System # 2-47W809-1, Rev. 2  
 Unit 2 Flow Diagram, Auxiliary Feedwater, System # 2-47W803-2, Rev. 4

### Work Orders

08-956891, Rev. 0, WBN-2-VTV-003-0907, Repack existing valves following EPRI guidelines  
 09-952782, Rev. 0, Refurbish Valve 2-DRV-001-0536  
 09-952848, Rev. 0, Refurbish Valve 2-DRV-003-0659  
 09-952847, Rev. 0, Refurbish Valve 2-DRV-003-0653  
 08-953773, Rev. 0, Refurbish Valve 2-TCV-067-108  
 08-953058, Rev. 0, Refurbish Pump 2-PMP-072-0010-B  
 08-953047, Rev. 0, Refurbish Pump 2-PMP-072-0027-A  
 08-953088, Rev. 0, Refurbish Pump 2-PMP-074-0020-B  
 08-953078, Rev. 0, Refurbish Pump 2-PMP-074-0010-A  
 08-953856, Rev. 0, Refurbish Valve 2-CKV-072-0562  
 08-953741, Rev. 0, Refurbish Valve 2-FCV-063-0166  
 08-953735, Rev. 0, Refurbish Valve 2-FCV-063-0130  
 09-952027, Rev. 1, Refurbish Valve 2-FCV-062-0056  
 08-953663, Rev. 0, Refurbish Valve 2-FCV-062-0056  
 08-953665, Rev. 0, Refurbish Valve 2-FCV-062-0059-B  
 09-953488, Rev. 0, Refurbish Pump 2-PMP-003-0002A-S  
 10-951301, Rev. 2, Refurbish Valve 2-EQIV-003-0297E/2  
 08-953313, Rev. 0, Refurbish Valve 2-LCV-062-0133-B  
 09-954352, Rev. 0, Refurbish Valve 2-LCV-062-0136-B  
 09-952053, Rev. 1, Refurbish Valve 2-ISV-062-0526-A  
 09-952898, Rev. 0, Refurbish Valve 2-FCV-003-0239  
 08-953660, Rev. 0, Refurbish Valve 2-FCV-062-0054  
 110963483, Rev. 0, Refurbish Pressure Instrument 2-PI-062-0105  
 110963479, Rev. 0, Refurbish Valve 2-RTV-062-0350A  
 08-953677, Rev. 0, Refurbish Valve 2-FCV-062-0083  
 111009822, Rev. 0, Refurbish Valve 2-ISV-062-0537  
 08-953159, Rev. 0, Refurbish Valve 2-FCV-062-0091  
 111105898, Rev. 0, Refurbish Valves 2-DRV-062-0730 and 2-DRV-062-0731

08-953680, Rev. 0, Refurbish Valve 2-FCV-062-0086  
 08-953066, Rev. 0, Refurbish Valve 2-CKV-062-0660  
 08-953060, Rev. 0, Refurbish Valve 2-CKV-062-0640  
 09-951633, Rev. 0, Refurbish Valve 2-ISV-003-0827  
 10-951206, Rev. 0, Refurbish Valve 2-BYV-003-0839  
 08-953506, Rev. 0, Refurbish Valve 2-LCV-003-0173  
 08-952777, Rev. 0, Refurbish Valve 2-CKV-003-0872  
 08-956881, Rev. 0, Refurbish Valve 2-VTV-003-0901  
 110789873, Rev. 0, Refurbish Valve 2-RTV-003-0351A  
 08-953206, Rev. 0, Refurbish Valve 2-FCV-003-0136A  
 08-952522, Rev. 0, Refurbish Valve 2-CKV-003-0810  
 08-955646, Rev. 1, Refurbish Valve 2-ISV-003-0809  
 09-952868, Rev. 0, Refurbish Valve 2-VTV-003-0905  
 08-953507, Rev. 0, Refurbish Valve 2-LCV-003-0174

### Miscellaneous

Refurbishment Scoping Document # Man-VLV-008, Refurbishment Scope Determination Form, Yarway Manual Valves, All Functions All Systems  
 Safety Evaluation Report Watts Bar Nuclear Plant, Unit 2-Program for Construction Refurbishment (TAC No. ME1708), dated 07/02/2010  
 Response letter to Watts Bar Nuclear Plant (WBN) Unit 2 – Request for Additional Information Regarding Construction Refurbishment Program Plan (TAC No. MD6581) TVA Tracking Number: T02 100527 001, dated May 27, 2010.  
 WBNEQ-SPLC-005 – EQ Binder for TYCO Electronics Raychem Division (Nuclear High Voltage Splice)  
 WBNEQ-CABL-064 – EQ Binder for Okonite Cables (TVA Type EPSJ)

Walkdown data sheets for the following devices:

### Junction Boxes

WBN-2-JB-292-1428-A  
 WBN-2-JB-292-1410-B  
 WBN-2-JB-292-1967-A  
 WBN-2-JB-292-1601-B  
 WBN-2-JB-292-1409-A

### Motors

WBN-2-MTR-003-0118D-A  
 WBN-2-MTR-003-0128-B  
 WBN-2-MTR-003-0128D-B  
 WBN-2-MTR-062-0104-B  
 WBN-2-MTR-062-0108-A

### Electrical Penetrations

WBN-2-PENT-293-0038-D  
 WBN-2-PENT-293-0049-G

### E.1.3 Active Mechanical System Components Onsite Inspection/Refurbishment

#### Vendor Manuals

WBN-VTD-Y010-0080, Rev 4, Instruction Manual for Yarway Figure 5515B-SA105  
 WBN-VTD-Y010-0030, Rev. 3, Instruction Manual for Yarway Figure 5500 Series Welbond Valve

#### Purchase Orders

77740, Rev. 1, Repair/Refurbish Steam Driven Auxiliary Feedwater Pump  
 10228, Rev. 2, Refurbish Turbine for Steam Driven Auxiliary Feedwater Pump

#### Miscellaneous

EDCR 52988-A, Rev. 0, "Engineering Requirements for Generic Packing Substitution"  
 Pipe Examination Report for WO 08-953856-000, Dated 4/14/2010

WBNEQ-SPLC-005 – EQ Binder for TYCO Electronics Raychem Division (Nuclear High Voltage Splice)  
 WBNEQ-CABL-064 – EQ Binder for Okonite Cables (TVA Type EPSJ)

### E.1.5 Passive Commodities Inspection/Refurbishment

#### Pipe Examination Reports

Visual exam of attached piping to 2-FCV-3-236 (WO 09-952896-000), dated 04/20/2010  
 Visual exam of attached piping to 2-FCV-3-0048A (WO 08-953494-000), dated 04/21/2010  
 Visual exam of attached piping to 2-FCV-3-0090A (WO 09-952790-000), dated 04/21/2010  
 Visual exam of attached piping to 2-FCV-3-242 (WO 09-952897-000), dated 04/21/2010  
 Visual exam of attached piping to 2-FCV-3-239 (WO 09-952898-000), dated 04/21/2010  
 Visual exam of attached piping to 2-FCV-3-245 (WO 09-952899-000), dated 04/21/2010  
 Visual exam of attached piping to 2-LCV-3-148 (WO 09-951580-000), dated 05/05/2010  
 Visual examination of piping near 2-FCV-62-9 (WO 08-953655-000), dated 04/27/2010  
 Visual examination of piping near 2-LCV-62-136B (WO 09-954352-000), dated 05/03/2010  
 Visual examination of piping attached to 2-LCV-62-133 (WO 08-953313-000), dated 06/03/2010  
 Visual examination of piping attached to 2-LCV-62-132 (WO 08-953312-000), dated 06/03/2010  
 Visual examination of piping attached to 2-PMP-62-104 (WO 08-953003-000), dated 06/18/2010  
 Visual examination of piping attached to 2-PMP-62-108 (WO 08-952996-000), dated 06/18/2010  
 Visual examination of piping attached to 2-FCV-62-83 (WO 08-953677-000), dated 06/23/2010