



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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July 31, 2009

Mr. Ashok S. Bhatnagar
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Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2009603**

Dear Mr. Bhatnagar:

On June 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of construction activities at your Watts Bar Unit 2 reactor facility. The enclosed integrated inspection report documents the inspection results, which were discussed on July 8, 2009, with Mr. Masoud Bajestani 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.

This inspection report discusses the closure of non-cited violations (NCVs). Also during this inspection period, your evaluations and methodology associated with the Concrete Quality Special Program were reviewed by the NRC staff and determined to be applicable to both Units 1 and 2. Issues pertaining to this special program have been previously addressed in NRC inspections reports, correspondence, and NUREG-1232. Based on the results of this inspection, this special program is closed for Unit 2; however, future inspections may be conducted for new concrete work and/or revised design work.

Additionally, during the inspection period a problem identification and resolution inspection was conducted, and the results are documented in this inspection report.

Your oversight of construction completion activities was generally effective. Based on the results of this inspection, no findings 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).

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 05000391/2009603 w/attachment

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Letter to Ashok S. Bhatnagar from Robert C. Haag dated July 31, 2009

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED
INSPECTION REPORT 05000391/2009603

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PUBLIC

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-391

Construction Permit No.: CPPR-92

Report No.: 05000391/2009603

Applicant: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 2

Location: 1260 Nuclear Plant Rd
Spring City TN 37381

Dates: April 1 – June 30, 2009

Inspectors: W. Bearden, Senior Resident Inspector, Construction Projects
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Approved by: Robert C. Haag, Chief
Construction Projects Branch 3
Division of Construction Projects

Enclosure

EXECUTIVE SUMMARY

Watts Bar Nuclear Plant, Unit 2 NRC Inspection Report 05000391/2009603

This integrated inspection included aspects of engineering and construction activities performed by TVA associated with the Watts Bar Unit 2 construction project. This report covered a three-month period of inspections in the areas of quality assurance; identification and resolution of construction problems; employee concerns program; construction activities; engineering activities; procurement; training and qualification of plant personnel; pre-service inspection activities; fire protection; and emergency preparedness. 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 continued to implement adequate controls to conduct ongoing procurement, design, and construction activities.

Inspection Results

- Management and quality assurance (QA) oversight continued to be adequate. (Section Q.1.1)
- The inspectors determined that TVA and Bechtel continued to implement an adequate corrective action program with thorough management and quality oversight. However, correction action plans were sometimes incomplete or poorly documented (Section Q.1.2)
- The inspectors determined that TVA and Bechtel had established an acceptable program and environment for allowing employees to identify quality or safety-related concerns. (Section Q.1.3)
- Other areas inspected were adequate with no findings of significance identified. These areas included physical walkdowns, construction activities, protected of installed equipment, procurement, pre-service examination, training, fire protection, and emergency preparedness. (Sections C.1.1 through C.1.6, C.1.8, E.1.1, T.1.1, F.1 and EP.1)
- During the inspection period the inspectors reviewed the Environmental Qualification (EQ) Special Program. The activities associated with the EQ program were adequate. (Section C.1.7)
- Two Non-cited violations that were previously identified in inspection reports 2008009 and 2009602, and their associated corrective actions were reviewed and closed in this inspection report. (Sections OA.1 and OA.2)

- Evaluations and methodology associated with the Concrete Quality Special Program were reviewed and determined to be applicable to both Units 1 and 2. Based on the results of this inspection, this special program is closed for Unit 2; however, future inspections may be conducted for new concrete design and construction activities. (Section OA.3)

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REPORT DETAILS

Summary of Plant Status

During the current inspection period, TVA continued to develop construction procedures and work instructions. Engineering design activities and physical plant walkdowns to determine the existing status of structures, systems, and components also continued during this inspection period. In addition, TVA had some quality and safety-related construction activities take place during the three-month inspection period.

I. Quality Assurance Program

Q.1 Quality Assurance (QA) Oversight Activities

Q.1.1 Quality Assurance Oversight of Construction Activities (Inspection Procedure [IP] 35960)

a. Inspection Scope

The inspectors assessed the adequacy of TVA and Bechtel QA oversight of ongoing construction activities including the review of several construction completion project quality surveillance reports issued by the Bechtel QA organization.

Specific documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspected QA surveillance reports were adequate.

Q.1.2 Identification and Resolution of Construction Programs (IP40504)

a. Inspection Scope

This inspection reviewed activities covering the previous eighteen month period. The inspectors supplemented IP 40504 with the guidance of Section 03.03.c from IP 71152, Identification and Resolution of Problems for inspection attributes. The objectives of this inspection were to evaluate the applicant's and contractor's problem identification threshold, effectiveness of immediate and preventive corrective actions, accuracy and thoroughness of problem documentation, adequacy of corrective actions for previously identified compliance issues, management/QA oversight of the corrective

action process, and to confirm that the applicant and contractors were complying with NRC requirements.

To accomplish these objectives, the inspectors reviewed results of previous inspections contained in NRC Report Nos. 050002008006, 2008007, 2008009, 2008010, and 2009602 to integrate them into this report and conducted additional reviews for all these areas. This included reviewing Problem Evaluation Reports (PERs) covering various departments and issues and all classification levels. PERs were selected from lists of PERs assigned to Engineering, Construction, Westinghouse, and Quality Assurance along with those resulting from assessment activities and trend PERs. Most PERs were reviewed after corrective actions had been implemented; however, some were reviewed after the corrective action plan was developed but prior to implementation. The inspectors reviewed corrective actions and PERs associated with non-cited violations (NCVs) 05000391/2009602-01, Failure to follow procedure for scaffold inspections and NCV 05000391/2008009-01, Protection of Installed Plant Equipment During Construction Activities. These NCVs and their associated PERs are further discussed in Section OA.1 and OA.2 of this inspection report. The inspectors also reviewed assessment documents including an audit, self-assessments, program performance indicators, and TVA Nuclear Assurance reports. The inspectors reviewed implementation of the industry operating experience review process and corrective actions associated with that process. The inspectors observed Project Management Review Committee meetings, a management trend review meeting, and PER Screening Committee meetings. The inspectors also reviewed activities associated with the use of industry experience and the Employee Concerns Program. In addition, the inspectors held discussions with personnel at various levels regarding specific issues and overall implementation of the corrective action program.

Specific documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified. The following observations were noted.

(1) Identification of Issues

Throughout the assessment period, the applicant and contractor personnel exhibited a low threshold for identifying issues. The inspectors, based on discussions with personnel and document reviews, noted that there was no reluctance to initiate PERs. The use of PERs was supported by the management team as the preferred mechanism to identify problems. The trending process improved over the period and the inspectors noted that trend PERs were initiated when appropriate. No unidentified trends were noted by the inspectors. Some historic problems were recognized and recent improvements were noted. The inspectors observed a screening committee meeting where two PERs were rejected for inadequate description issues. The inspectors considered the relatively new screening committee to be a positive initiative to the corrective action process and this group was affecting improvement.

(2) Prioritization and Evaluation of Issues

Typically, classification levels were conservative, cause evaluations were appropriate and sufficiently thorough, extent of condition was considered when appropriate, and most

corrective action plans matched the problem causes. The inspectors noted several examples where corrective actions appeared incomplete as follows:

PER 159451: The Project QA organization had submitted Level B PER 159451 in December 2008 to highlight an adverse trend of failures to complete, or document the completion of, required reading training. The training organization's evaluation of the trend confirmed that training status was not being updated in the computerized eTrack information system and determined that two organizations in particular had a substantial number of persons who were past due. A corrective action plan was implemented with all corrective actions signed off as complete as of April 17, 2009; however, the inspectors determined that in the Engineering Pipe Support Walkdown group, records showed 29 individuals had past due training of all types, i.e., classroom, Computer-Based Training, and Required Reading. A report from the eTrack information system indicated 20 of the 29 individuals had Required Reading training that was past due 12 months or more. The individuals had completed all the training required to perform the safety related activities that they were assigned. PER 174989 was initiated to evaluate and disposition the inspectors' observation.

In addition, during the review of PER 159451, the inspectors observed that original PERs 158110, 158270, and 159535 had been inappropriately closed to PER 159451, i.e., the specific adverse conditions identified in the original PERs were not addressed by PER 159451. The inspectors determined that no regulatory requirements were violated. PER 174782 was initiated to evaluate and disposition the NRC observation.

PER 162651: The problem stated in the description is related to the lack of clear objective acceptance criteria for HILTI bolt installation in the QC checklist and the associated instruction, i.e., verify that concrete spalling is not "detrimental to anchor". The corrective action provided addressed the specific installation instance and not the stated problem with the checklist and the associated instruction. PER 175051 was initiated to address this observation.

PER 160814: This PER involved an American Society of Mechanical Engineers (ASME) valve data sheet (VDS) issue for Design Change Notice (DCN) 52798. This PER was posted against Unit 2 only (rather than Unit 1 and U2). The inspectors questioned whether the PER had been reviewed against Unit 1 requirements such as ASME Section XI and 10CFR50.59. In addition the revised VDS was inserted into the specification after it has been certified. This issue was not addressed by the action plan. PER 175057 was initiated to address the second observation only.

PER 159447: This PER discussed the use of acceptable American Institute of Steel Construction (AISC) code editions in the Design Criteria (DC). The DC applied to both U1 and U2. The combination of description and corrective action was unclear. Based on interviews, the PER was addressing the removal of the AISC code editions from the DC and the corrective action was reinstating them for internal analyses and removing them for vendor supplied analyses. The documented corrective action did not address the described problem, i.e., the removal of the code editions. In addition, it did not provide justifications for making the changes to the DC.

170788: This PER involved a problem with concrete drilling. While the applicant was aware that a possible contributor to the problem was a limitation of survey equipment to measure the thickness of concrete, this aspect of the problem was not included in the

PER. This PER had not been fully evaluated at the time of inspection. The applicant revised it to include the additional information.

Evaluations of the issues contained in PERs 159447 and 160814 were not complete at the end of the inspection; therefore, resolution of these issues will be tracked in Inspector Follow-Up Item (IFI) 05000391/2009603-01: Resolution for PERs 159447 and 160814.

While no significant safety issues were identified, documentation in this area needs improvement, primarily in the completeness of documentation but also, in some cases, in the thoroughness of the corrective action plan. The inspectors noted that corrective measures had recently been initiated including extra reviews and an effort to assure closeout personnel utilize a checklist for more thorough reviews.

(3) Use of Industry Experience

PER 170492, Operating Experience Program, was documented as a result of a Nuclear Assurance assessment to address OE program deficiencies. The inspectors noted that a program and process were in place for sharing operating experience information, including vendor recommendations and internally generated lessons learned. The information was collected, evaluated, and communicated to affected internal stakeholders as specified in TVA procedure NGDC PP-8, Operating Plan, Rev 0, which was used by the OE coordinator; however, the procedural directives contained in NGDC PP-8 were only applicable to TVA. The inspectors review of two Bechtel procedures containing OE guidance showed that the guidance was limited to pre-job briefs and incident investigations and not applicable to work order or design development. The applicant had identified the need to improve in this area and PER 175020 was initiated to address this issue. In addition, the inspectors noted that the applicant was not fully utilizing previous construction experience and reviews in this area which could be helpful.

(4) Program Oversight and Self-Assessment

Adequate management oversight was noted and has improved over the assessment period as evidenced by the execution of thorough audits and self-assessments. Management oversight of trends and backlogs was limited earlier in the period but has recently expanded. Appropriate performance indicators are being tracked to provide information to management. Early in the assessment period, the inspectors had noted limited management oversight of training but noted a recent initiative to increase management observations in this area.

(5) Effectiveness of Corrective Actions

Many corrective actions were noted which affected improvement; however, some problems have persisted over the period and the applicant/contractor had yet to show that corrective actions have been effective. For example, training issues have persisted throughout the period beginning with the fact that a good process for tracking training was not in place, then implementation problems were identified and they still persist. Also identified were problems with classroom training. The classroom training related problems did not result in adverse consequences. A thorough classroom training session was observed by the inspectors during this inspection; however, it is not clear that this improvement will be consistent. The inspectors noted that there were planned

actions associated with first time evolutions including improved training; however, an observation during this inspection of a first time evolution briefing to management did not have the intended rigor established. Management appropriately noticed this and took appropriate actions. Other areas noted where persistent problems have occurred included engineering errors and work order processing errors.

Relative to the applicant's required effectiveness reviews, the current standard is minimal, i.e. the program requires that root cause PERs get an effectiveness review at a six month interval or management can direct an effectiveness review. However, the inspectors noted that an action had been established to require additional effectiveness reviews for all confirmed trend PERs and at a three month interval which is more appropriate for a construction organization.

c. Conclusions

The inspectors determined that TVA and Bechtel continued to implement an adequate corrective action program with thorough management and quality oversight. However, corrective action plans were sometimes incomplete or inadequately documented.

Q.1.3 Safety Conscious Work Environment (IP 40504)

a. Inspection Scope

The inspectors reviewed TVA's and Bechtel's programs for resolving employee concerns. This review covered documents and reports during the last 18 months, some of which were documented in previous NRC inspection reports. The review included interviews with the site employee concern representative, review of a listing of new employee concerns, evaluation of any anonymous concerns, and review of corrective actions for selected concern files. The inspectors reviewed and evaluated the adequacy of the programs to provide employees with an alternate method to identify quality or safety-related concerns. The inspectors also reviewed the applicant's provisions for providing mechanisms for workers to report conditions that may be adverse to quality. The inspectors reviewed several anonymous PERs and verified that they had been adequately captured and addressed. In addition, during interactions with Bechtel employees, the inspectors posed questions regarding their ability to raise safety concerns.

Specific documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified. The inspectors determined that TVA's and Bechtel's employee concern program was adequate. Employees interviewed expressed knowledge of the employee concerns program and the ability to raise safety related concerns through various available means.

c. Conclusions

The inspectors determined that TVA and Bechtel had established an acceptable program and environment for allowing employees to identify quality or safety-related concerns. In addition, the program was being implemented accordingly through different

provisions including the use of raising issues to management, anonymous PERs, exit interviews, and employee concerns representatives.

II. Management Oversight and Controls

C.1 Construction Activities

C.1.1 Pipe Supports – Procedure Reviews, Walkdowns and QA Oversight (IPs 50090 and 46071)

a. Inspection Scope

The inspectors conducted independent field verifications and reviews of the piping support walkdowns. This activity was related of TVA's program to verify the field configuration of safety-related hangers and supports including anchor bolts. This was also done to determine whether the installation of safety-related pipe supports and restraints were performed by qualified personnel in compliance with NRC requirements, applicant commitments, and applicable codes. Furthermore, the inspectors reviewed TVA's procedures WDP-PD-2, Revision 6, "Walkdown Procedure for Piping and Pipe Supports" and WDP-GEN-1, Revision 12, "General Walkdown Requirements," to determine whether QA plans, instructions, and procedures for safety-related pipe supports and restraints had been implemented throughout the facility. The inspectors directly observed field walkdowns inside Unit 2 containment per Work Packages WBN2-PD-074-2326-11, WBN2-PD-067-2282-02, and WBN2-PD-063-2334-41, for the following:

- Hanger/Support #2-74-008,
- Hanger/Support #47A450-25-137, and
- Hanger/Support #2-63-473

The inspectors also conducted independent field verifications of the following twelve safety-related hangers and supports to determine if the as-built configuration of the piping supports reflected the completed walkdown piping support packages and drawings:

- Hanger/Support #47A437-4-97 (WBN2-PD-074-1603-10)
- Hanger/Support #47A437-4-90 (WBN2-PD-074-1598-09)
- Hanger/Support #47A437-4-91 (WBN2-PD-074-1598-10)
- Hanger/Support #47A437-4-98 (WBN2-PD-074-1603-11)
- Hanger/Support #2-62A-835 (WBN2-PD-062-1498-36)
- Hanger/Support #2-70-889 (WBN2-PD-070-1871-01)
- Hanger/Support #47A450-25-348 (WBN2-PD-067-1892-01)
- Hanger/Support #2-70-353 (WBN2-PD-070-1720-04)
- Hanger/Support #47A060-61-2 (WBN2-PD-061-2288-16)
- Hanger/Support #H-450-2-8-70 (WBN2-PD-067-1541-02)
- Hanger/Support #47A427-2-43 (WBN2-PD-003-1595-01)
- Hanger/Support #74-2RHR-R65 (WBN2-PD-074-1960-00)

In addition, the inspectors reviewed the applicable portions of the QA plan, specifications, and procedures, training program, anchor bolt qualification report and IE bulletin 79-02. Specific documents reviewed for this inspection are listed in the attachment under Section T.1.1.

Lastly, the inspectors reviewed Bechtel QA organization surveillance reports associated with pipe support walkdowns. Specific documents reviewed for this inspection are listed in the attachment under Section Q.1.1.

The following samples were inspected:

- IP 50090 Section 02.01.a - one sample
- IP 50090 Section 02.01.f – 1 sample
- IP 50090 Section 02.02.a – 2 samples
- IP 50090 Section 02.03.e – 3 samples
- IP 50090 Section 02.03.f – 12 samples
- IP 50090 Section 02.04.a – 6 samples
- IP 46071 Section 02.03 – 34 samples
- IP 46071 Section 02.01.a - one sample
- IP 46071 Section 02.01.b - one sample
- IP 46071 Section 02.01.c - one sample

b. Observations and Findings

No findings of significance were identified. Walkdown procedures reviewed appeared to be adequate and were being implemented appropriately. The inspectors determined that the piping support walkdown activity, including independent verification of hanger/support measurements, was being properly conducted. During the inspection, the inspectors noted that the dimension line for Hanger/Support #47A450-25-348 (WBN2-PD-067-1892-01) was not detailed enough to determine the correct location and measurement. PER 171384 was initiated to address this concern. QA oversight of pipe support installation activities was adequate.

c. Conclusions

The inspectors determined that walkdown activities associated with safety-related pipe hangers and supports were being performed in accordance with applicable procedures and documented appropriately.

C.1.2 RPV Internals and Protection of Installed Plant Equipment during Construction Activities (IPs 50051 and 50053)

a. Inspection Scope

The inspectors conducted inspections of the reactor pressure vessel (RPV) and upper internals storage, preservation, housekeeping, and protection activities to determine whether requirements, work procedures, and quality control inspection procedures were being met. These activities are controlled by procedure 25402-000-GPP-0000-N2102, Housekeeping, Revision 4. On May 24, 2009, the inspectors entered the RPV to observe the condition of the RPV and to ensure that housekeeping measures were in place. On June 4, 2009, the inspectors observed work associated with split pin replacement activities and inspected housekeeping measures for the upper internals and core barrel during these activities. This work was performed under work order (WO) 09-952170-000 which was used to implement engineering design change request (EDCR) 53124, "Tube Support Pins and Core Exit Thermocouple Columns."

The following samples were inspected:

- IP 50051 Section 02.04.e - one sample
- IP 50053 Section 02.01.c - one sample
- IP 50053 Section 02.02.b - one sample
- IP 50053 Section 02.03.b - one sample
- IP 50053 Section 02.03.c - one sample
- IP 50053 Section 02.03.d - one sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

Adequate controls were in place during this inspection period to protect the RPV, core barrel, and lower internals. Split pin replacement was performed in accordance with applicable specifications and procedures.

C.1.3 Construction Activities – HVAC Walkdowns (IP 50100)

a. Inspection Scope

The inspectors observed the as-built installation of three seismic supports for ductwork associated with the heating, ventilation, and air conditioning (HVAC) system. The inspectors independently verified the data collected in several walkdown packages and confirmed the accuracy of the measurements obtained. This activity was part of TVA's program to validate the condition of the supports for the ductwork. The inspectors reviewed TVA's walkdown procedures to determine whether they provide adequate guidance. Specific documents reviewed are listed in the attachment.

The following samples were inspected:

- IP 50100 Section 02.04.c – three samples

b. Observations and Findings

No findings of significance were identified. The inspectors determined that the ductwork support walkdown, including measurements, was properly conducted. While performing independent verification of the measurements, the inspectors noted that TVA's measurement of one support was inconsistent with the associated drawing. PER 173531 was initiated to address this concern.

c. Conclusions

The activities observed relative to the walkdowns of safety-related HVAC seismic supports were adequate and completed in accordance with applicable procedures.

C.1.4 Safety-Related Piping QA Review and Work Observation (IPs 49061 and 49063)

a. Inspection Scope

The inspectors reviewed the applicable portions of the QA manual and selected construction completion project procedures associated with work on safety-related piping to verify adequacy of ongoing work activities. Specifically, the inspectors reviewed piping installation/removal procedures, cleanliness control procedures, and EDCR 52326, Revision A, "Deletion of RTD Bypass Piping and Associated Pipe Supports."

The inspectors observed work in progress associated with WO 08-951038-001 for the removal of various sections of ASME Section III, Class I piping and pipe supports to implement EDCR 52326. The inspectors observed cutting, grinding, and other removal activities, along with cleanliness control measures. Additionally, the inspectors reviewed field drawings, procedures, and documentation of quality-related inspections.

The following samples were inspected:

- IP 49061 Section 02.01 - one sample
- IP 49063 Section 02.01 - one sample
- IP 49063 Section 02.02 - one sample
- IP 49063 Section 02.03 - one sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The activities observed relative to RTD bypass piping and support removal were adequate and completed in accordance with applicable drawings and specifications.

C.1.5 Pre-Service Examination of Safety-Related Welds (IPs 73052 and 73053)

a. Inspection Scope

The inspectors observed selected ongoing pre-service examinations performed on ASME Section III, Class 1, safety-related, stainless steel piping welds in the safety injection (SI) system. Non-destructive examination (NDE) activities observed included three liquid penetrant (PT) and three ultrasonic (UT) examinations. The inspectors verified that the examinations were conducted in accordance with approved procedures and consistent with ASME Code requirements. Examination records were reviewed to determine whether they were prepared, evaluated, and maintained in accordance with applicable commitments and/or requirements.

Specific PT activities observed and reviewed included the following:

<u>Report #</u>	<u>Weld ID</u>	<u>Component</u>
P0365	SIS-112A	6-inch SI system stainless steel piping weld

P0377	SIF-0196-10	10-inch SI system stainless steel piping weld
P0378	SIF-0196-06A	10-inch SI system stainless steel piping weld

Specific UT activities observed and reviewed included the following:

<u>Report #</u>	<u>Weld ID</u>	<u>Component</u>
P0366	SIS-113	6-inch SI system stainless steel piping weld
P0367	SIF-0199-09	10-inch SI system stainless steel piping weld
P0368	SIS-121	10-inch SI system stainless steel piping weld

The records were compared to the applicable codes, ASME Boiler and Pressure Vessel Code, Section III, 1971 Edition with Addenda through Summer 1973 and Section XI, Division 1, Inservice Inspection of Nuclear Power Plant Components, 2001 Edition through the 2003 addenda to verify compliance. Additionally, the inspectors reviewed qualification records and eye examination documentation for the associated NDE examiners. Specific documents reviewed are listed in the attachment.

The following samples were inspected:

- IP 73052 Section 02.02 - one sample
- IP 73052 Section 02.03 - two samples
- IP 73053 Section 02.02 - four samples (three Level II and one Level III)
- IP 73053 Section 02.03.e – six samples (three UT and three PT)

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that the observed pre-service examination NDE activities met applicable ASME code requirements and other regulatory requirements.

C.1.6 Electrical and Instrument Systems and Components- Procedures Review, Work Observations and Record Review (IPs 51051, 51053, 51055, 51061, 51063, 51065, 52051, 52053, and 52055)

a. Inspection Scope

The inspectors observed activities associated with electrical and instrument systems and components. Specifically, the inspectors interviewed staff and observed receipt inspection and storage. In addition, the inspectors reviewed records and procedures related to receipt inspection, handling and storage of electrical components and cables to ensure that they were procured, received, and stored in accordance with the purchase order requirements. This included review of the specified requirements in the purchase order, packing list, certificate of conformance, material receiving report, hardware disposition tracking report, non-conformance reports, and qualification records of Level II receipt inspectors.

In addition, the inspectors held discussions with TVA and Bechtel receipt inspection personnel regarding the completed receipt inspection of transferred cables from other

TVA sites such as transfers XFR-47608 and XFR-49209. The inspectors also observed actual receipt inspection and storage of Rockbestos 4/C#16 AWG wire, part number WVC-50 under DCNs 52289 and 52290. Additional selected receipt inspection and storage records listed in the attachment were reviewed.

The inspectors observed receipt inspection activities for the Tyco-supplied insulated AMP crimps including review of the commercial grade dedication documentation. This included measuring the thickness of the crimp barrel and the interior conductor space using calibrated measurement pins. The inspectors observed receipt inspection personnel looking for any potential physical damage of crimps and verifying the identification of terminations, physical conditions, part numbers, manufacturer, wire and stud size, and color codes, as part of the receipt inspection process.

The inspectors also observed the handling of vital inverter #2 when transferred from the temporary storage area in auxiliary transformer room 2B to its permanent location in the 480V board room 2B on elevation 772.

In addition, the inspectors reviewed work procedures associated with electrical components, systems and cables. Specific documents reviewed are listed in the attachment under Section T.1.1.

Lastly, the inspectors reviewed Bechtel QA organization surveillance reports associated with instrument controls and systems. Specific documents reviewed are listed in the attachment under Section Q.1.1.

Samples inspected are as follows:

- IP 51051 Section 02.02.a - 1 sample
- IP 51051 Section 02.02.b - 1 sample
- IP 51051 Section 02.02.c - 1 sample
- IP 51051 Section 02.02.d - 1 sample
- IP 51053 Section 02.02.b - 1 sample
- IP 51053 Section 02.02.c - 1 sample
- IP 51055 Section 02.02.a - 13 samples
- IP 51055 Section 02.02.b - 13 samples
- IP 51061 Section 02.02.a - 1 sample
- IP 51061 Section 02.02.b - 1 sample
- IP 51061 Section 02.02.c - 1 sample
- IP 51063 Section 02.02.a - 1 sample
- IP 51063 Section 02.02.b - 1 sample
- IP 51065 Section 02.02.a - 7 samples
- IP 51065 Section 02.02.b - 7 samples

b. Observations and Findings:

No findings of significance were identified.

c. Conclusions

The inspected activities associated with work procedures, receipt inspection, handling and storage of electrical and instrument components and systems were adequate.

C.1.7 Inspection of Watts Bar Nuclear Plant Environmental Qualification Special Program (IP 51053 and Temporary Instruction (TI) 2512/036)

a. Inspection Scope

The inspectors reviewed the Environmental Qualification (EQ) Special Program to determine the status of implementation. The inspectors reviewed Limited Scope Walkdown (LSWD) request 1167, dated April 27, 2009, which was generated to determine the qualification status of safety-related equipment located in the harsh and essentially mild areas of Unit 2. The inspectors also observed staff in the field as they began gathering this information.

The inspectors observed work associated with the environmental qualification program of safety-related electrical equipment located in harsh and mild areas of Unit 2. TVA performed this activity to determine the qualification status and gather data on specific components of safety-related equipment located in the harsh and essentially mild areas of Unit 2. The inspectors reviewed WDP-E-4, "Walkdown Procedure for Electrical," Revision 2, and observed work performed on WOs 09-952118-13 and 09-952118-17.

The following samples were inspected:

- IP 51053 Section 02.02.e – two samples

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspected activities associated with the EQ program were adequate.

C.1.8 Structural Steel and Supports - Work Observation (IP 48053 and 55100)

a. Inspection Scope

The inspectors observed surface preparation, shielded metal arc welding (SMAW) or stick welding, and grinding activities on structural steel in lower containment associated with EDCR 52912, Revision A, "Connection Modifications on Existing Access Platforms in the Reactor Building." The inspectors reviewed WO 08-957071-000 and associated specifications, and drawings. The inspectors observed a quality control inspector review and approve fit-up and alignment in accordance with the WO. The inspectors conducted interviews with the field personnel to discuss the scope of work being performed.

The following samples were inspected:

- IP 48053 Section 02.02 - one sample
- IP 48053 Section 02.03.c - one sample
- IP 48053 Section 02.04 - one sample
- IP 55100 Section 02.06- one sample (SMAW or stick welding)

b. Observations and Findings

No findings of significance were observed.

c. Conclusions

The activities observed relative to structural steel were adequate and completed in accordance with applicable drawings and specifications

E.1 Engineering Activities

E.1.1 Procurement Activities (IPs 35960, 51053, and 51055)

a. Inspection Scope

The inspectors reviewed procurement documents and interviewed personnel associated with ongoing procurement activities. This review included procurement specifications, technical notes, material requirements details, nuclear supplier QA program requirements data sheets, procurement data sheets, receipt verification/inspection requirements, and certificates of compliance. Additional details are discussed in Section

C.1.6, "Electrical and Instrument Systems and Components," of this report. Documents reviewed are listed in the attachment under Section C.1.6.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

QA and management oversight of procurement activities was adequate.

T.1 Training and Qualification of Plant Personnel

T.1.1 Craft Training (IPs 46071, 50090, 51051, and 51061)

a. Inspection Scope

The inspectors observed classroom training sessions associated with undercut and wedge-type anchor bolt installation and monitored lab sessions on anchor bolt installation. The inspectors reviewed the associated procedures and lesson plans and held discussions with the instructors.

Additionally, the inspectors observed classroom training sessions associated with cable installation, termination, splicing, and crimping on Unit 2 safety-related installations. The inspectors also monitored lab sessions on cable terminating, splicing, and crimping using the appropriate tools. The training sessions were conducted to provide guidance on implementing procedures 25402-000-GPP-0000-N3303 for cable installation, Modification Addition Instruction (MAI)-3.2 for cable pulling, MAI-3.7 for cable pull force monitoring, and MAI-3.3 for cable termination in accordance with various TVA lesson plans on cable crimping, splicing and termination. The sessions included classroom discussions on crimping techniques and tools, and hands-on crimping and splicing using Raychem materials and shrink heat gun. Documents reviewed are listed in the attachment.

b. Observations and Findings

No findings of significance were identified; however, the inspectors noted an observation during cable terminations training. The inspector identified that procedure 25402-MGT-0002, "Training" did not provide specific guidance for examination administration. PER 170645 was initiated to address this observation. The inspectors concluded that, overall, the electricians exhibited the knowledge required to adequately perform cable pulling and termination activities.

c. Conclusions

TVA's program for training of electrical personnel was generally adequate for the current level of construction activities. Inspected work procedures were adequate.

III. Operational Readiness Activities

F.1 Fire Protection (IP 64051)

a. Inspection Scope

The inspectors discussed with TVA and Bechtel personnel fire protection requirements applied to Unit 2 construction activities which were established to prevent an adverse effect of a fire on Unit 1 operations. The inspectors verified that TVA inspected the fire suppression devices per site procedural requirements at the prescribed intervals. Additionally, the inspectors interviewed the fire watch who was responsible for overseeing welding activities occurring in lower containment. The inspectors reviewed fire protection procedures to verify their adequacy related to fire suppression during construction activities taking into account the impact on the operating unit. In addition, the inspectors reviewed action plans, communication and training for fire protection and prevention.

Procedures reviewed included:

- BP-241, Fire Protection Review of Facility Design and Modifications, Rev. 1
- SPP-10.9, Control of Fire Protection Impairments, Rev. 3
- SPP-10.10, Control of Transient Combustibles, Rev. 5
- SPP-10.11, Control of Ignition Sources (Hot Work), Rev. 3

In addition, the inspectors conducted a visual inspection of several fire suppression and detection devices dedicated for Unit 2 areas inside the reactor building, control building, auxiliary building, and lower containment. The inspectors conducted a walkdown of TVA's established fire protection/prevention controls for Unit 2. The inspectors also observed fire prevention aspects associated with cutting activities of the 2M-9 panel in the control room associated with EDCR 52366, Modifications of Main Control Room Panel 2-M-9.

The following samples were inspected:

- IP 64051 Sections 02.02 - one sample
- IP 64051 Sections 02.03 - one sample
- IP 64051 Sections 02.04 - one sample
- IP 64051 Sections 02.06 - one sample
- IP 64051 Sections 02.07 - thirteen samples
- IP 64051 Sections 02.08 - one sample

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

TVA implemented adequate fire protection and prevention measures and controls to support Unit 2 construction activities and minimize impact on Unit 1 operation activities.

EP.1 Emergency Preparedness

a. Inspection Scope

An emergency preparedness inspection was conducted at Watts Bar from June 8 through June 12, 2009. The inspection focused on Unit 1 and was conducted in accordance with IMC 2515 inspection procedures; however, in order to have a complete assessment of emergency preparedness at the site, the inspectors reviewed Unit 2 current and major milestone activities to determine if they could have an impact on emergency response capability or on any emergency action levels for event declaration. In addition, the inspectors' walk-through of the plant-protected area included Unit 2 activities. The inspectors also discussed with TVA the demonstration of the assembly and accountability for the site taking into account the impact of Unit 2 construction activities.

b. Observations and Findings

No findings of significance were identified.

The activities reviewed would not have a negative impact on Watts Bar emergency response capability or the emergency action levels. Two items related to assembly, accountability, and early dismissal of Unit 2 personnel as required by an emergency response event, were demonstrated by TVA in the second quarter of 2009. Early dismissal of Unit 2 construction personnel has been proceduralized in Emergency Plan Implementing Procedure (EPIP)-8, "Personnel Accountability and Evacuation", to minimize the impact on egress routes from the site.

c. Conclusions

The inspectors determined that the Watts Bar emergency response capabilities were adequate commensurate with ongoing Watts Bar Unit 2 construction activities at the time of inspection.

IV. Other Activities

OA.1 (Closed) Non-cited Violation (NCV) 05000391/2009602-01, Failure to Follow Procedure for Scaffold Inspections

a. Inspection Scope

The inspectors reviewed corrective actions associated with PER 165792, "ABSCE Boundary Scaffold Inspections." This PER addressed NCV 05000391/2009602-01, "Failure to Follow Procedure for Scaffold Inspections."

In addition, the inspectors reviewed PER 165806, "ABSCE Scaffold List for DCN 52283;" and PER 170430, "The Problem Description and Apparent Cause in PER 165792 Do Not Clearly Align;" which were associated with the original PER 165792.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that the issues were effectively tracked in the applicant's corrective action program and that the corrective actions implemented to date were adequate. Based on the inspection of these items, this NCV is closed

OA.2 (Closed) NCV 05000391/2008009-01, Protection of Installed Plant Equipment During Construction Activities.

a. Inspection Scope

The inspectors also reviewed corrective actions associated with PER 150799, "Non-Compliance with NQA Manual App B - RG-1.39." This PER addressed NCV 05000391/2008009-01, "Protection of Installed Plant Equipment During Construction Activities."

In addition, the inspectors reviewed PERs 163541, "Untimely Response to NRC Issues;" and 169290, "Gen Review WBN U2 163541;" which were associated with the original PER 150799.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The inspectors determined that the issues were effectively tracked in TVA's corrective action program and that the corrective actions implemented to date were adequate. Based on the inspection of these items, this NCV is closed.

OA.3 (Closed) Inspection of Watts Bar Unit 2 Concrete Quality Special Program (TI 2512/033)

a. Inspection Scope

The concrete quality special program is related to the adequacy of the concrete quality at the Watts Bar site, as identified in Employee Concern Inquiry (IN) 85-995-002. This concern resulted in the identification of three significant issues (Nonconformance Condition Reports 6719, 6720, and 6721) affecting concrete quality as follows:

- Some concrete mixes did not meet design compressive strength requirements
- The use of mortar was not properly controlled
- Concrete sampling frequencies did not always comply with the requirements identified in specifications.

The NRC staff documented its review of the Watts Bar Unit 2 Concrete Quality Special Program in a letter to TVA dated February 11, 2009. The staff concluded that this special program be closed based on a review of TVA report CEB-87-03C, "Watts Bar Nuclear Plant -Concrete Quality Evaluation -Testing of In-Place Concrete," being applicable to both units. This concrete evaluation report was forwarded by letter dated April 16, 1987. Based on the above, the staff determined that the conclusion in NUREG-1232 which states, "... the strength of concrete and bedding mortar at Watts Bar is satisfactory from a safety standpoint and these issues are resolved," was applicable to Unit 2.

In addition to the NRC staff review, NRC inspectors conducted an independent review of previous NRC inspection reports which addressed the special program; Concrete Quality Evaluation Reports CEB 86-19-C and 87-03-C; NUREG-1232, Volume 4, "Safety Evaluation Report on Tennessee Valley Authority: Watts Bar Nuclear Performance Plan, Watts Bar Unit 1" (January 1990); and other correspondence. During the review, the inspectors noted that the concrete quality evaluation reports addressed concrete pour samples from multiple locations including the Unit 2 reactor building and shared structures such as the auxiliary building, diesel generator building, control building, and intake pumping station. Moreover, concrete design drawings for Category I structures were revised to incorporate a reference to ensure proper concrete design strengths are used in future design evaluations.

The following NRC inspection reports (IRs) documented resolution of this issue as summarized below

- NRC IR 50-390/89-03 stated the following, "A field audit was conducted in February 18, 1987, by NRC headquarters staff and NRC consultants. Region II reviewed concrete sample testing at Singleton labs and the inspection was documented in IR 390/87-04. The resident inspector's review of core sample selection is contained in IR 390/87-03. The reviews performed to date indicate this issue is essentially resolved. NRC final review is pending".
- In a letter dated August 31, 1990, the NRC stated the following, "In the SER dated December 28, 1989, the staff concludes that the strength of concrete and bedding mortar at WBN is satisfactory from safety standpoint, and the issues on concrete quality at WBN are resolved".
- NRC IR 50-390/90-24 and 50-391/90-24 closed CDRs 50-390/86-45 and 50-391/86-43, associated with Deficiencies Sampling and Control of Concrete. The report also states that concrete design drawings for Category I structures were revised to incorporate a reference to ensure proper concrete design strength are used in future design evaluations.
- NRC IR 50-390/90-26 and 50-391/90-26 further discusses an inspection that was conducted by regional inspectors in the fall of 1990. During this inspection the inspectors walked down the following structures:
 - Intake structure
 - Auxiliary building
 - Unit 1 and 2 reactor containment building
 - Diesel generator building
 - Unit 1 and 2 reactor containment shield structures
 - Control building

As a result of this inspection, the inspectors concluded that the concerns related to concrete quality had been resolved and there were no unresolved issues related to concrete quality.

- NRC IR 50-390/94-87 documented an inspection of the design capacity of concrete structure at Watts Bar. The inspectors also reviewed Concrete Quality Evaluation report CEB 86-19-C, which had been previously reviewed and approved by the NRC Office of Special Projects, and concluded that the applicant had an in-depth program to evaluate the structures at Watts Bar.

b. Observations and Findings

No findings of significance were identified.

c. Conclusions

The issues pertaining to concrete quality have been previously addressed and resolved for Units 1 and 2 as documented in the above inspections reports, NRC correspondence

and NUREG-1232. Although NUREG 1232 only addressed Unit 1; the evaluations and methodology reviewed by the NRC staff and discussed in NUREG 1232 are applicable to both Units 1 and 2. In addition, the concrete pour samples documented in the concrete quality evaluation reports included multiple locations including the Unit 2 reactor building and common structures such as the auxiliary building, diesel generator building, control building, and intake pumping station.

Based on the results of this inspection and the NRC letter to TVA dated February 11, 2009, no additional inspection is required and this special program is closed; however, future inspections may be conducted for new concrete work and/or revised design work.

V. Management Meetings

X.1 Exit Meeting Summary

On July 8, 2009, the resident inspectors presented the inspection results to Mr. Masoud Bajestani and other members of his staff. Although some proprietary information may have been reviewed during the inspection, no proprietary information was included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant personnel

G. Arent, Licensing Manager, Unit 2
J. Atwell, Project Director, Bechtel
M. Bajestani, Vice President, Unit 2
M. Bali, Electrical Design Manager, Bechtel
R. Baron, Nuclear Assurance Project Manager, TVA, Unit 2
B. Briody, Maintenance and Modifications Manager, TVA, Unit 2
P. Byron, Licensing Engineer
B. Crouch, Lead Mechanical Engineer, TVA, Unit 2
T. Franchuk, Quality Manager, Bechtel
E. Freeman, Engineering Manager, TVA, Unit 2
W. Goodman, Procurement Manager, Bechtel
D. Haggarty, Pipe Support Walkdown Manager, Bechtel
J. Hannah, Corrective Action Coordinator, Bechtel
L. Harrison, Pipe Support Walkdown Group Training Coordinator, Bechtel
S. Hilmes, Lead Electrical Engineer, TVA, Unit 2
M. Lackey, ECP Rep, TVA, Unit 2
R. Kuhn, Quality Assurance Manager, Bechtel
D. Malone, Quality Assurance, TVA, Unit 2
J. McCarthy, Licensing Engineer, Unit 2
R. Moll, Preop Startup Manager, TVA, Unit 2
D. Myers, Quality Assurance Manager, TVA, Unit 2
L. Davenport, Contracts/Procurement Manager, TVA, Unit 2
D. Osborne, Lead Civil Engineer, TVA, Unit 2
J. Robertson, Acting Engineering Manager, Bechtel
S. Sawa, Training Manager, Bechtel
J. Schlessel, Construction Manager, TVA, Unit 2
D. Soberski, Quality Control Supervisor, Bechtel
P. Theobald, Radcon Supervisor, TVA, Unit 2
A. Aldridge, Acting Construction Manager, Bechtel
D. Tinley, Quality Assurance, TVA, Unit 2
D. Webb, Operations Manager, TVA, Unit 2

INSPECTION PROCEDURES USED

IP 35061	In-depth QA Inspection of Performance
IP 35960	QA Program Evaluation of Engineering Organization
IP 40504	Part 52, Identification and Resolution of Construction Problems
IP 46071	Concrete Expansion Anchors
IP 48053	Structural Steel and Supports Work Observation
IP 49061	Safety-Related Piping QA Review
IP 49063	Safety-Related Piping Work Observation
IP 50051	Reactor Vessels and Internals QA Review
IP 50053	Reactor Vessel and Internals Work Observation
IP 50090	Pipe Support and Restraint Systems
IP 50100	Heating, Ventilation and Air Conditioning Systems
IP 51051	Electrical Components and Systems Procedure Review
IP 51053	Electrical Components and Systems Work Observation
IP 51055	Electrical Components and Systems – Record Review
IP 51061	Electrical Cable – Procedure Review
IP 51063	Electrical Cable Work Observation
IP 51065	Electrical Cable Record Review
IP 52051	Instrument Components and Systems Procedure Review
IP 52053	Instrument Components and Systems Work Observation
IP 52055	Instrumentation Components and Systems Records Review
IP 55100	Structural Welding General
IP 64051	Procedures - Fire Prevention/Protection
IP 73052	Preservice Inspection – Procedure Review
IP 73053	Preservice Inspection – Observation of Work and Work Activities
TI 2512/033	Concrete Quality Special Program
TI 2512/036	Environmental Qualification Special Program

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open

05000391/2009603-01	IFI	Resolution of PERs 159447 and 160814 (Section Q.1.2)
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Closed

5000391/2009602-01	NCV	Failure to Follow Procedure for Scaffold Inspections (Section OA.1)
5000391/2008009-01	NCV	Protection of Installed Plant Equipment During Construction Activities (Section OA.2)
TI 2512/033	TI	Concrete Quality Special Program (Section OA.3)

Discussed

None

LIST OF DOCUMENTS REVIEWED

I. Quality Assurance Program

Q.1.1 QA Management of Construction Activities

WBN2 Quality Surveillance Reports

25402-WBN-SR-09-0452, Pipe support drawing review
 25402-WBN-SR-09-0455, Pipe support walkdown package WBN2-PD-062-1939-02 review
 25402-WBN-SR-09-0440, Pipe support walkdown package WBN2-PD-003-1982-02 review
 25402-WBN-SR-09-0424, Pipe support walkdown package WBN2-PD-067-1929-01 review
 25402-WBN-SR-09-0422, Pipe support walkdown package WBN2-PD-062-1498-13 review
 25402-WBN-SR-09-0392, Pipe support walkdown package WBN2-PD-003-1595-02 review
 25402-WBN-SR-09-0436, QC verification of pipe support removal
 25402-WBN-SR-09-0457, CRDR Panel 2-M-30 component removal observation
 25402-WBN-SR-09-0458, CRDR Panel 2-M-9 component removal observation
 25402-WBN-SR-09-0461, CRDR Panel 2-L-10 component removal observation
 25402-WBN-SR-09-0412, CRDR Panel 2-M-4 component removal observation
 25402-WBN-SR-09-0437, Unit 1 critical evolution meeting/Unit 2 Panel 2-M-9 welding
 25402-WBN-SR-09-0430, Fab shop weld material issue station controls
 25402-WBN-SR-09-0431, Blowout panel welding and filler material control observation
 25402-WBN-SR-09-0463, Aux Feedwater System piping analysis review
 25402-WBN-SR-09-0464, 125VDC Vital Battery analysis review
 25402-WBN-SR-09-0445, Commercial grade dedication
 25402-WBN-SR-09-0443, Resolution of ANI open issues
 25402-WBN-SR-09-0428, Monthly summary report of closed EDCRs – March 2009
 25402-WBN-SR-09-0442, Housekeeping
 25402-WBN-SR-09-0435, Review of Calculation 090200AY01, for CSST A and B tap changers
 25402-WBN-SR-09-0451, Warehouse control of safety and quality related materials
 25402-WBN-SR-09-0408, Training records for Sargent & Lundy personnel preparing EDCRs
 25402-WBN-SR-09-0407, ASME survey work order packages

Q.1.2 Identification and Resolution of Construction Problems

Procedures/Programs

25402-MGT-003, Corrective Action Program, Rev. 3
 25402-MGT-002, Training, Rev. 5

Problem Evaluation Reports (PERs)

158229, Problems with Closed PERs
 158312, Surveillance Identified Problems with PER Corrective Actions
 161950, Completed Hardware Disposition Tracking Reports not Attached to PERs
 162911, Hardware Disposition Tracking Report Process Issues
 164546, Ineffective Corrective Actions for Work Order Administrative issues
 164584, Recurring Difficulty in Successfully Implementing First Time Evolutions

164962, PER Extensions Process Problems
170280, Potential Gap Identified in the Bechtel QA Oversight Program
170555, Corrective Action Program Procedure Requirements not being met
171034, Project Missing Opportunities for Improving Performance Relative to Corrective Action Plans
171035, Corrective Actions do not Address Stated Cause
172122, CAP Procedure Deficiency Regarding Functional Evaluations Coordination with Unit 1
148667, Inspector Failure to Record Arc Strike Anomaly in U2 Reactor Vessel
148906, Submittal of PER 148667 Was Not Timely
152244, Ineffective Coordination of U2 Schedules with U1 Schedules
152645, Tasks on U2 Schedule Deleted from U1 Outage Scope
153559, Discrepancies Found in Calculation for Safety Injection System
153656, Design Output Errors in Field Change Request
154698, Improper Use of Field Change Request to Issue Work Instruction
158339, Incorrect As-Built Measurements of Pipe Support Positions
159090, Inaccurate Pre-Job Briefing Provided for Incore Tubing Assessments
159451, Adverse Trend for Failures to Document Required Reading
163804, Corrective Action Program Documents Not Available for ASME Survey
165296, Westinghouse Documentation of Field Change Notice Not Correct
137352, Problems in Administrative Change for Drawing Revisions
157101, Project Procedures Do Not Provide Adequate Guidance for Design Interface Control
159095, Error in the Work Scope Statement of EDCR 52621 Rev. B
159430, Design Verification Checklist lacks direction
159447, Design Criteria Removed Specified AISC Code Editions
159524, Errors Identified in Diesel Generator Loading Analysis
159552, Use of EDCR Rather Than DCN for Combustible Loading Calculations
160292, No Impact-Review as Required by SPP-9.3, Section 3.4.3.C.2.i.(2) was performed
160319, TVA Mechanical Oversight Identified Errors in Seven Calculations
160341, Valve Data Sheet and Bill of Materials Do Not Match Up
160814, Valve Data Sheet Revised With No Revision to the Associated Specification
160925, Information Not Depicted On Drawings
160985, Administrative Errors in Calculation
161253, Extension Requests Not Submitted in a Timely manner
161663, Closed EDCRs Not Signed by a Design Engineer As Required by Procedure
161843, Errors in calculation 48N091306B092
161866, Errors Found In DCN 52619
161960, Error in Piping Analysis Calculation N3-24-01T R0
162580, Modeling Discrepancy Found In TMG Model
162651, Unclear Hilti Kwik Bolt III Acceptance Criteria
163388, Untimely Extension Request
163424, An Information Only drawing Was Used As Input To a Unit 2 Calculation
163987, Inappropriate Power Source For the Dynaco Roll-Up Doors
164060, Inter Discipline Reviewer Signed For Civil EGS
164203, Supporting calculations Not Issued At The Time of DCN Issue
164470, DCN 52798 Signed Prior To Approval Of Associated calculations
164961, Calculations Cross-Reference Other Calculations That Have Not Been Issued
165093, Incorrect Cable Specified In DCN 52283
165200, Errors And Discrepancies In DCN 52619
159525, Process Enhancement For Design Verification
161110, Administrative Deficiencies With Piping stress calculation N3-02-19T
162088, 50.59 Reviews For WBN Unit 1 That Assumed WBN Unit 2 Was Not Complete

165637, Untimely EDCR Issuance
 166005, Boundaries for Bechtel's Use of TVA Processes
 166024, Drawing Discrepancies
 170502, Piping Material Certifications Do Not Invoke Correct ASME Code Edition and Addenda
 150799, Non-Compliance with NQA Manual App B – RG-1.39
 163541, Untimely Response to NRC Issues
 169290, Gen Review WBN U2 163541
 165792, ABSCE Boundary Scaffold Inspections
 165806, ABSCE Scaffold List for DCN 52283
 170430, The Problem Description and Apparent Cause in PER 165792 do not Clearly Align
 141190, Electrical Collecting Method Issue
 149176, Incorrect use of Minor Maintenance Work Orders
 146685, Unit 2 Work on Components using Unit 1 Procedures
 146687, Unit 2 Ice Basket Work Order
 149335, Fire Seals Breached without Fire Impairment TI-65 Permit
 149829, Fire Seal Breach
 149043, Conduit Seals Required for ABSCE Seals
 152110, Residue on the SFP Water
 159358, Unplanned ODCM Action Entry
 163965, Generic Review
 164303, Drawing in Completed Work Order did not Match the Required Drawing in EDCR
 171720, Completed Corrective Action in PER 1634303 is Inappropriately Archived
 165448, ABSCE EDCR Package Closure
 171717, Additional Corrective Actions for PER 165448 are required
 170788, Drill Stop Fail to Perform

TVA Oversight/Self-Assessment Documents

Nuclear Assurance Assessment NA-WB-09-011, Corrective Action Program
 NA-WB-09-008, Nuclear Assurance Oversight Report for March 2009
 NA-WB-09-012, Nuclear Assurance Oversight Report for April – May 2009

Bechtel Oversight/Self-Assessment Documents

Audit No. 25402-WBN-AR-09-0001, Corrective Action Program, Rev. 0
 Self-Assessment Report 25402-SA –CON-08-001, PER Closure Quality
 Self-Assessment Report WBN-U2-LIC-F-09-001, Problem Identification and Resolution

Industry Experience Documents

PER 170492, Operating Experience Program, C Level
 NA-WB-09-011, Corrective Action Program Assessment

 25402-000-GPP-0000-N1206, Work Order Processing, Rev 4
 25402-MGT-0004, Incident Investigation and Root Cause Analysis, Rev 0

Q.1.3 Safety Conscious Work Environment

PERs

166785, Supervisor Review of PERs

166529, Anonymous PER
 166793, Anonymous PER
 166795, Anonymous PER
 153427, Walkdown Packages

II. Management Oversight and Controls

C.1.3 HVAC Walkdowns

Procedures

WDP-C-3, Walkdown Procedure for Civil, Rev. 3
 WDP-Gen-1, General Walkdown Requirements, Rev. 12

Packages

WBN2-C-065-250-04, Document Information for HVAC Ductwork and Duct Support
 WBN2-C-065-250-16, Document Information for HVAC Ductwork and Duct Supports
 WBN2-C-065-250-30, Document Information for HVAC Ductwork and Duct Supports

Drawings

47W915-16, Mechanical Heating and Ventilating Seismic Duct Supports, Rev. 7
 47W920-24H, Mechanical HVAC Hanger Location Drawing, Rev. 1

C.1.5 Pre-Service Examination of Safety-Related Welds

Procedures and Standards

Preservice Inspection Program Plan, WBN-2 PSI Rev. 1, 10/23/2008
 IEP-200, Qualification and Certification Requirements for TVA Nuclear Power Group
 Nondestructive Examination Personnel, Rev. 10
 IEP-300, Qualification and Certification of Ultrasonic TVA Nuclear Power Group Personnel for
 Preservice and Inservice ASME XI Examinations, Rev. 3
 N-PT-9, Liquid Penetrant Examination of ASME and ANSI Code Components and Welds, Rev.
 33
 N-UT-64, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. 11
 N-UT-84, Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe
 Welds, Rev. 0

Examination Reports

PT Report R-P0365
 PT Report R-P0377
 PT Report R-P0378
 UT Report R-P0366
 UT Report R-P0367
 UT Report R-P0368

Other Documents Reviewed

Drawing ISI-2063-W-08, Rev. 0
 Drawing ISI-2063-W-09, Rev. 0
 Qualification records for UT and PT exam personnel

C.1.6 Electrical and Instrument Systems and Components

Procedures

25402-000-GPP-0000-N3303, Cable Installation, Rev.1
 25402-000-GPP-0000-N6102, Field Material Requisition and Purchasing, Rev. 7
 25402-000-GPP-0000-N6104, Materials Receiving, Rev.1
 SPP-4.2, Material Receipt and Inspection, Rev.20
 SPP-4.3, Material Storage and Handling, Rev.06
 TI-300, Electrical Arc Flash Personal Protective Equipment & Protective Boundary Matrices, Rev.6
 EMQ001.036, Fabricate low voltage terminations, Rev.3
 MAI-3.2, Cable Pulling for insulated cables rated up to 15,000 volts, Rev.20
 MAI-3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up to 15,000 volts, Rev.24
 MAI-3.7, Cable Pull Force Monitoring Breakline Fabrication, Verification and Control, Rev. 1
 MAI-3.8, Installation of Electrical Components, Rev.6

Work Order

08-812562-003, pull cables associated with 2-INV-235-0001-D

Purchase Orders

5063-00226 (2/C #14 Rockbestos cables Cat.ID. BVC536D),
 5063-00235 (500MCM Rockbestos cables Cat. ID. BTL531L and 3/C #2 Cat. ID. BTV971K, HDTR 170334)
 5063-00239 (1/C #6 Cat.ID. BPH138Q 1 shipment)
 5063-00230 (1/C #4/O Cat.ID. BTL460W 2 shipments)
 160-01572 (4 circuit breakers WES, 225A Cat.ID. CNM270E and 4 circuit breakers 400A Cat.ID. CNM281X)
 70933 (Southern Testing Service push button switch Cat.ID. CNR069X, connector pins Cat.ID. CNR961J, 50 electrical contacts Cat.ID. BXG602T)
 72840 (Energy Steel Co. conductor bus Cat.ID. BPM426Y, NCR #1606)
 73778 (Ametek Solid State Controls electrical fan Cat.ID. CKG827P, electrical light Cat.ID. CNW425V, capacitor for inverters Cat.ID. BTX465Q, fuses Cat.ID. CKG801B, terminal blocks Cat.ID. CNW449D)

Miscellaneous Documents

G-38, Installation, Modification, and Maintenance of Insulated Cables rated up to 15,000 volts, Rev. 20

E.1 Procurement Activities

E.1.1 Engineering Design Activities and Control

See Section C.1.6, Electrical and Instrument Systems and Components

T.1 Training and Qualification of Plant Personnel

T.1.1 Craft Training

MAI-3.7, Cable Pull Force Monitoring Breakline Fabrication, Verification and Control, Rev. 1

MAI-3.8, Installation of Electrical Components, Rev.6

MAI-3.2, Cable Pulling for insulated cables rated up to 15,000 volts, Rev.20

MAI-3.3, Cable Terminating, Splicing, and Testing for Cables Rated Up to 15,000 volts, Rev.24

25402-MGT-0001, Training, Rev. 5

25402-000-GPP-0000-N3303, Cable Installation, Rev.1

25402-000-GPP-0000-N6102, Field Material Requisition and Purchasing, Rev.7

25402-000-GPP-0000-N6104, Materials Receiving, Rev.1

TRN-15, Electrical Maintenance Personnel Training, Rev.10

SPP-1.1, Training and Qualification of Personnel, Rev. 13

SPP-4.2, Material Receipt and Inspection, Rev.20

SPP-4.3, Material Storage and Handling, Rev.06

EME033.001, Maintenance Training-Electrical, Rev.1

EME033.002, Cable Splicing and Terminations, Rev.1

TI-300, Electrical Arc Flash Personal Protective Equipment & Protective Boundary Matrices, Rev.6

LIST OF ACRONYMS

ABSCE	Auxiliary Building Secondary Containment Enclosure
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CRDR	Control Room Design Review
DCN	Design Change Notice
EDCR	Engineering Design Change Request
ESL	Evaluated Suppliers List
EQ	Environmental Qualification
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter (NRC)
IN	Inquiry
IP	Inspection Procedure (NRC)
MAI	Modification Addition Instruction
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NRC	Nuclear Regulatory Commission
PER	Problem Evaluation Report
PI&R	Problem Identification and Resolution
PT	Penetrant Testing
QA	Quality Assurance
RPV	Reactor Pressure Vessel
TVA	Tennessee Valley Authority
UT	Ultrasonic Testing
WBN	Watts Bar Nuclear Plant
WO	Work Order