



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

September 21, 2015

Mr. Michael D. Skaggs
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SUBJECT: ERRATA - WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC
INTEGRATED INSPECTION REPORT 05000391/2015604 AND NOTICE OF
VIOLATION

Dear Mr. Skaggs:

On June 29, 2015, the United States Nuclear Regulatory Commission (NRC) issued the subject NRC Integrated Inspection Report 05000391/2015-604 for Watts Bar Nuclear Plant Unit 2 (ADAMS Accession No. ML15181A446). In reviewing this report, it was determined that paragraphs C.1.6.a and C.1.6.b needed to be revised. Please replace pages 17 through 53 of the original report with the enclosed pages 17 through 55.

Should you have any questions concerning this letter, please contact me at 404-997-4446.

Sincerely,

/RA/

Robert Haag, Chief
Construction Projects Branch 4
Division of Construction Projects

Docket No. 50-391
Combined Permit No. CPPR-92

Enclosure: Inspection Report No. 05000391/
2015604, pages 17 - 55

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Letter to Michael D. Skaggs from Robert C. Haag dated September 21, 2015

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4INTEGRATED INSPECTION REPORT 05000391/2015604 AND NOTICE OF
VIOLATION

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PUBLIC

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cc w/encl: (See next page)

*See Previous Concurrence

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ADAMS: ☒ Yes ACCESSION NUMBER: __ML15265A199__

☒ SUNSI REVIEW COMPLETE ☒ FORM 665 ATTACHED

OFFICE	RII:DCI	RII:DCI	RII:DCP				
SIGNATURE	/RA/	/RA/	/RA/				
NAME	K. Steddenbenz	R. Musser	B. Haag				
DATE	09/15/2015	09/15/2015		9/ /2015	9/ /2015	9/ /2015	9/ /2015
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\CC\IDCP\CPB3\WATTS BAR 2\CURRENT DRAFT INSPECTION
REPORT\2015\IR 2015-604\WBN2 ERRATA (00000004).DOCX

C.1.6 (Closed) Inservice Inspection - Review of Program (Inspection Procedure 73051), Inservice Inspection - Review of Procedures (Inspection Procedure 73052), and Preservice Inspection - Observation of Work and Work Activities (Inspection Procedure 73053)

a. Inspection Scope

For IP 73051 and IP 73052, the inspectors reviewed the Containment Preservice Inspection (CPSI) Program Plan and the Preservice Inspection Program Plan to verify those programs were in compliance with the 2001 Edition through 2003 Addenda of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, that they had been reviewed by an Authorized Nuclear Inservice Inspector (ANII), and were reviewed and approved by the applicant's designated representatives. Specifically, the inspectors reviewed the Program Plans to verify they met the requirements of Subsection IWE, Table IWE-2500-1 for the containment system, and Subsection IWF, Table IWF-2500-1 for snubbers; reviewed the ASME B&PV Code edition and addenda to verify the appropriate edition and addenda were being applied per 10 CFR Part 50.55a and the approved proposed alternative (ADAMS Accession No. ML110260025); reviewed comments provided by the ANII during their review of those programs; and reviewed Program Plans to ensure they were reviewed by the appropriate applicant representatives.

- IP 73051 Section 02.01 – one sample
- IP 73052 Section 02.01 – one sample

For IP 73053, the inspectors reviewed the qualifications and certifications of three Level II non-destructive examination (NDE) examiners and one Level III examiner, involved in the conduct of preservice inspection examinations, to ensure they met the requirements of Section XI of the ASME B&PV Code. Specifically the inspectors reviewed the certifications to ensure they contained the employer's name, person being certified, activity qualified to perform, level of qualification, and basis for certification. No Level 1 examiner certifications were available.

- IP 73053 Section 02.02 – 4 samples

The inspectors also reviewed the following design drawings of the thermal barrier to verify the interface between the basemat and containment vessel shell (702' elevation) will be covered by an insulation package which includes stainless steel flashing and caulking, as well as acts as a barrier to protect the insulation underneath from moisture:

- 2-48N401, Structural Steel Containment Vessel Anchor Bolt Plan & Base Dets-Sh 1, Rev. 1
- ISI-20MC-E-36, Metal Containment Knuckle Plate & Anchor & Flashing, Rev. 2
- ISI-20MC-E-37, Metal Containment Leak Chase Channel & Box Locations, Rev. 2

The following tables list the inspections that were performed under this IP and documented in earlier inspection reports.

IP 73051 Section	Inspection Reports	ADAMS Accession Number
02.01 Program Approval	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 • 05000391/2010602, Section C.1.16 • 05000391/2010604, Section C.1.11 • 05000391/2012602, Section C.1.5 • 05000391/2013612, Section C.1.12 	<ul style="list-style-type: none"> • ML093030479 • ML101230144 • ML103060240 • ML12087A324 • ML13088A066
02.02 Program Organization	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 	<ul style="list-style-type: none"> • ML093030479
02.03 Quality Assurance Program	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 • 05000391/2010602, Section C.1.16 • 05000391/2011608, Section C.1.12 	<ul style="list-style-type: none"> • ML093030479 • ML101230144 • ML11311A082
02.04 Repair Program	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.10 	<ul style="list-style-type: none"> • ML112201418
02.05 Replacement Program	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.10 	<ul style="list-style-type: none"> • ML112201418
02.06 Records	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 	<ul style="list-style-type: none"> • ML093030479
02.07 Qualification of Personnel	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 	<ul style="list-style-type: none"> • ML093030479
02.08 Reporting Requirements	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 	<ul style="list-style-type: none"> • ML093030479
02.09 Relief Requests	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.11 • 05000391/2010603, Section C.1.11 	<ul style="list-style-type: none"> • ML093030479 • ML102170465

IP 73052 Section	Inspection Reports	ADAMS Accession Number
02.01 Program Requirements	<ul style="list-style-type: none"> • 05000391/2012602, Section C.1.5 	<ul style="list-style-type: none"> • ML12087A324
02.02 Procedure Approval	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.12 • 05000391/2009603, Section C.1.5 	<ul style="list-style-type: none"> • ML093030479 • ML092120326
02.03 Non-Destructive Examination (NDE) Procedure Review	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.12 • 05000391/2009603, Section C.1.5 	<ul style="list-style-type: none"> • ML093030479 • ML092120326

	<ul style="list-style-type: none"> • 05000391/2010603, Section C.1.12 	<ul style="list-style-type: none"> • ML102170465
02.04 Code Repair or Replacement Procedure Review	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.10 	<ul style="list-style-type: none"> • ML112201418

IP 73053 Section	Inspection Reports	ADAMS Accession Number
02.01 Preservice inspection (PSI) plan review	<ul style="list-style-type: none"> • 05000391/2012602, Section C.1.6 	<ul style="list-style-type: none"> • ML12087A324
02.02 Examiner qualification review	<ul style="list-style-type: none"> • 05000391/2010602, Section C.1.17 	<ul style="list-style-type: none"> • ML101230144
02.03 Observe four different methods of examination of components	<ul style="list-style-type: none"> • 05000391/2009604, Section C.1.13 (PT, UT) • 05000391/2009603, Section C.1.5 (UT) • 05000391/2010602, Section C.1.17 (ECT) • 05000391/2010603, Section C.1.13 (UT) • 05000391/2010605, Section OA.1.11 (UT) • 05000391/2013612, Section C.1.9 (MT) 	<ul style="list-style-type: none"> • ML093030479 • ML092120326 • ML101230144 • ML102170465 • ML110410680 • ML13088A066
02.04 Pressure Boundary Repair	<ul style="list-style-type: none"> • 05000391/2011605, Section C.1.11 • 05000391/2013612, Section C.1.13 	<ul style="list-style-type: none"> • ML112201418 • ML13088A066

b. Observations and Findings

No findings were identified. During the review of the CPSI Program Plan, the inspectors observed that the inspection of the thermal barrier was listed as a non-ASME Code Section XI augmented examination. The inspectors questioned the applicant whether this barrier also acts to prevent moisture intrusion at the basemat to containment vessel shell interface and should be inspected per the ASME Section XI requirements, specifically Subsection IWE, Table IWE-2500-1, Category E-A, Item E1.30, "Moisture Barriers." The applicant captured this question in their corrective action program under CR 1019951 and subsequently revised their CPSI plan to include the barrier as an Item E1.30 ASME Code exam.

c. Conclusions

The inspectors determined that inspection procedures 73051, 73052, and 73053 have been completed based on this inspection and previous inspection activities documented in the inspection reports listed above. Inspection Procedures 73051, 73052, and 73053 are closed.

P.1 Preoperational Activities

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

a. Inspection Scope

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

- System 063 - Safety Injection
- System 003B - Auxiliary Feedwater
- System 070 – Component Cooling Water System
- System 072 – Containment Spray System

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

- general plant/equipment conditions;
- plant areas for fire hazards - examined fire alarms, extinguishing equipment, actuating controls, firefighting equipment, and emergency equipment for operability and also verified that ignition sources and flammable material were being controlled in accordance with the applicant's procedures;
- activities in progress (e.g., maintenance, preoperational testing, etc.) were being conducted in accordance with the applicant's procedures;
- watched for abuse of installed instrumentation such as stepping or climbing on the instrumentation that could affect the calibration or ability to function;
- listened for the public address system announcements to determine that blind spots do not exist; (i.e., cannot be heard clearly enough to be understood);
- construction work force was authorized to perform activities on systems or equipment; and
- looked for uncontrolled openings in previously cleaned or flushed systems or components.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusion

The applicant's implementation of the preoperational test program was in accordance with procedures for those activities observed during the inspection period.

P.1.2 Preoperational Test Procedure Review (Inspection Procedures 70300, 70336, 70338, 70343)

a. Inspection Scope

Background: The purpose of preoperational test inspection is to verify through direct observation, personnel interviews, and review of facility records that:

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

IMC 2513 requires the procedural review of the mandatory tests defined in IMC 2513 and five of the primal tests defined in IMC 2513. The following inspections were performed in relation to satisfying the required procedural reviews.

Inspection Activities: The inspectors reviewed procedures to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the final safety analysis report (FSAR), docketed correspondence, safety evaluation report (SER), Technical Specifications, and Regulatory Guide 1.68. The test procedures reviewed were:

- 2-PTI-003B-04, "Auxiliary Feedwater Pumps & Valves Logic Test," Rev. 0 and 1
- 2-PTI-003B-05, "Auxiliary Feedwater Dynamic Test," Rev. 1
- 2-PTI-072-01, "Containment Spray Pump and Valves Logic Test," Rev. 0 and 1
- 2-PTI-074-01, "Residual Heat Removal System Pump/Valves Logic," Rev. 1

Additionally, the inspectors reviewed preoperational test procedures to verify that the procedures contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- each page had appropriate identification information;
- the last page was clearly identifiable by markings;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- equipment alignment instructions are clear and concise;
- equipment identifiers are accurate;
- actions to be taken within the steps are specifically identified;

- instrumentation units are consistent for data collection;
- graphs, charts, tables, data sheets, and work sheets are clearly usable;
- calculation sheets are technically accurate;
- clear coordination instructions exist for test activities involving multiple test personnel;
- clear instructions exist for system restoration;
- guidance for follow-up actions and points of contact;
- clear concise steps for testing with action critical (acceptance criteria) steps identified;
- clear quantitative acceptance criteria with acceptability and contingencies;
- overall sequence of the procedure is consistent with obtaining the intended result; and
- system boundaries were reviewed to verify adequate overlap exists between tests to ensure the entire system will be tested.

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

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedures were written in a manner consistent with the guidance of procedure SMP-8.0, "Watts Bar Nuclear Plant Unit 2 Administration of Preoperational Test Instructions," Rev. 11. This completes the procedure review of preoperational test procedures 2-PTI-003B-04, 2-PTI-003B-05, 2-PTI-072-01, and 2-PTI-074-01. The preoperational testing procedure reviews for Systems 003B and 072 (IPs 70338 and 70343) are closed.

P.1.3 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope

Background: The purpose of preoperational test inspection is to verify through direct observation, personnel interviews, and review of facility records that:

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

IMC 2513 defines the minimum inspection program for a finding of readiness for license issuance (IP 94302, Status of Watts Bar Unit 2 Readiness for an Operating License).

IMC 2513 requires the preoperational test witnessing of the mandatory tests defined in IMC 2513 and five of the primal tests defined in IMC 2513. The following inspection was performed in relation to satisfying the required preoperational test witnessing.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instructions 2-PTI-061-02, "Ice Condenser Ice Loading," Rev. 1, to verify that the testing was conducted in accordance with approved procedures, 0-MI-61.06 "Servicing Ice Condenser," Rev. 2; 2-MI-61.001 "Initial Ice Loading," Rev. 0; and 0-SOI-61.02 "Ice Charging System," Rev. 2. In addition, the inspections were completed to verify the adequacy of test program records and preliminary evaluation of the test results.

The inspectors assessed the following attributes associated with these test observations:

- all personnel were on station and had the latest revision of the procedure;
- prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed appropriately;
- administrative test controls were properly followed; and
- personnel were using approved procedures.

The inspectors observed the ice condenser preoperational tests to support the loading of the Unit 2 ice condenser to verify that the ice baskets met the TS weight requirements and the ice mixture chemistry requirements. The inspectors conducted a review with the responsible test engineer to ensure that the preliminary test evaluations were consistent with the inspector's observations. The inspectors observed the Unit 2 ice loading activities to ensure the ice basket weights and chemistry data were properly gathered and recorded. A cursory review of the data was performed to verify the adequacy of the data sheet entries.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the Unit 2 ice loading activities were completed in accordance with the approved procedures and the initial ice condenser basket weights and chemistry data was properly recorded and evaluated.

P.1.4 Preoperational Test Witnessing (Inspection Procedures 70302, 70312, and 70438)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-003B-05, "Auxiliary Feedwater System Dynamic Test," Rev. 1 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following components' logic tests were selected for inspection of this item:

- Section 6.1, 2-PMP-3-118, Auxiliary Feedwater Pump 2A-A, Hydraulic Performance Test
- Section 6.2, 2-PMP-3-118, Auxiliary Feedwater Pump 2A-A, 48 Hour Endurance Test

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5.

P.1.5 Preoperational Test Witnessing (Inspection Procedures 70302, 70312, and 70433)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-062-02, "Boric Acid Subsystem Logic Test," Rev. 1 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following component's logic test was selected for inspection of this item:

- Section 6.4, 2-FCV-62-140

The inspectors assessed the following attributes associated with this test observation:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5.

P.1.6 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-063-04, "Safety Injection System RWST and Containment Sump Annunciators," Rev. 0 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following components' logic tests were selected for inspection of this item:

- Section 6.1, RWST Low-Low Level Annunciator
- Section 6.2, RWST Level Full and Startup Makeup Annunciators
- Section 6.4, RWST Temperature Annunciators

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

The inspectors observed the tests to verify that the overall test acceptance was met. The inspectors conducted a review with the responsible test engineer to assure that the

preliminary test evaluations were consistent with the inspector's observations. During the tests, the inspectors observed important data gathering activities to ensure the data was properly gathered and recorded. A post-test cursory review of the test data was performed to verify legibility, traceability, and permanence of the data sheet entries.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5. This completes the planned test witnessing inspection of preoperational test procedure 2-PTI-063-04 associated with refueling water storage tank (RWST) and containment sump annunciator testing.

P.1.7 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-067-01, "ERCW Valve Functional Test," Rev. 1 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following components' logic tests were selected for inspection of this item:

- Section 6.2, 2-FCV-67-87
- Section 6.4, 2-FCV-67-89
- Section 6.5, 2-FCV-67-91
- Section 6.6, 2-FCV-67-95
- Section 6.7, 2-FCV-67-96
- Section 6.8, 2-FCV-67-97
- Section 6.10, 2-FCV-67-103
- Section 6.21, 2-FCV-67-138
- Section 6.22, 2-FCV-67-139
- Section 6.23, 2-FCV-67-141
- Section 6.25, 2-FCV-67-295
- Section 6.26, 2-FCV-67-296
- Section 6.27, 2-FCV-67-297
- Section 6.28, 2-FCV-67-298
- Section 6.38, 2-FCV-67-67

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5. This completes the planned test witnessing inspection of preoperational test procedure 2-PTI-067-01 associated with ERCW valve functional testing.

P.1.8 Preoperational Test Witnessing (Inspection Procedures 70302 and 70312)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-067-03, "ERCW Valve Logic Test," Rev. 1 to verify that the testing was conducted in accordance with approved procedures

and to verify the adequacy of test program records and preliminary evaluation of test results. The following components' logic tests were selected for inspection of this item:

- Section 6.1, 2-FCV-67-123
- Section 6.29, 2-FCV-67-143
- Section 6.30, 2-FCV-67-146

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5.

P.1.9 Preoperational Test Witnessing (Inspection Procedures 70302, 70312, and 70439)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-070-01, "Component Cooling Water Pump/Valve Functional Test," Rev. 1 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following component's logic tests were selected for inspection of this item:

- Section 6.4, 2-FCV-70-134
- Section 6.7, 2-FCV-70-92
- Section 6.9, 2-FCV-70-100
- Section 6.13, 2-FCV-70-156
- Section 6.16, 2-FCV-70-3-B
- Section 6.19, Thermal Barrier Booster Pump 2B-B Operational Test
- Section 6.22, Component Cooling Pump C-S Pump Logic (Train A)

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit

2 Conduct of Test,” Rev. 5. This completes the planned test witnessing inspection of preoperational test procedure 2-PTI-070-01 associated with component cooling water pump/valve logic testing.

P.1.10 Preoperational Test Witnessing (Inspection Procedures 70302, 70312, and 70443)

a. Inspection Scope

Background: The background for this preoperational test witnessing is the same as that in the background section of P.1.3.

Inspection Activities: The inspectors witnessed activities associated with the performance of preoperational test instruction 2-PTI-072-01, “Containment Spray Pump Valve Logic Test,” Rev. 1 to verify that the testing was conducted in accordance with approved procedures and to verify the adequacy of test program records and preliminary evaluation of test results. The following component’s logic tests were selected for inspection of this item:

- Section 6.3, 2-FCV-72-22 and 2-FCV-72-44
- Section 6.6, 2-FCV-72-41
- Section 6.11, Containment Spray Pump 2A-A Flow Performance Test

The inspectors assessed the following attributes associated with these test observations:

- all test personnel were on station and had the latest revision of the procedure;
- test prerequisites were performed;
- plant systems were in service to support the test;
- test equipment was installed and within calibration;
- testing was performed in accordance with the approved procedure;
- test interruptions and continuations were handled in accordance with approved procedures and documented in the chronological test log;
- testing events and discrepancies were properly documented in the test deficiency log;
- testing was executed and coordinated properly;
- data was properly collected;
- temporary equipment was installed and tracked appropriately;
- administrative test controls were properly followed; and
- test personnel were using approved drawings and vendor manuals.

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

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the applicant's test procedure was performed in a manner consistent with the guidance of procedure SMP-9, "Watts Bar Nuclear Plant Unit 2 Conduct of Test," Rev. 5. This completes the planned test witnessing inspection of preoperational test procedure 2-PTI-072-01, "Containment Spray Pump Valve Logic Test."

P.1.11 Preoperational Test Results Evaluation (Inspection Procedures 70562)

a. Inspection Scope

Background: The purpose of preoperational test inspection is to verify through direct observation, personnel interviews, and review of facility records that:

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

IMC 2513 requires the pre-operational test results review of the mandatory tests defined in MC 2513 and five of the primal tests defined in MC 2513. IIR 05000391/2014608 (ADAMS Accession No. ML14322A182) documented the test witnessing inspection of the performance of IP 70462, "Preoperational Test Witnessing-Reactor Coolant System Cold Hydrostatic Test." The following inspection was performed using IP 70562 to satisfy the review of facility records of the mandatory test.

Inspection Activities: The inspectors reviewed test result package 2-PTI-068-14, "Unit 2 Cold Hydro Summary Report," Rev. 1 dated January 15, 2015, to verify that the hydrostatic test was performed in accordance with the applicable procedure. Specifically, the inspectors reviewed the summary report to verify:

- changes were made in accordance with applicant's administrative controls;
- the test procedure satisfied the commitments to testing made by the applicant;
- the system boundary contained all required components, pressure vessels, piping, pumps, and valves;
- the hydrostatic test met the requirements required by ASME Boiler and Pressure Vessel Code (BPVC) Section III;
- test deficiencies are resolved and retest requirements have been completed; and
- test results have been reviewed and approved by appropriate personnel.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the review of the applicant's hydrostatic test results package, the inspectors determined that the test was performed in accordance with the appropriate procedure and met the requirements invoked by NRC regulations and ASME B&PV Code Section III. IP 70562 is considered closed based on this review.

III. OPERATIONAL READINESS ACTIVITIES

O.1 Operations

O.1.1 (Closed) Quality Assurance Program - Procurement Control (Inspection Procedure 35746)

a. Inspection Scope

Background: This IP provided guidance to the inspectors in reviewing QA program documentation to verify that the applicant had developed and implemented a QA Program related to the control of procurement activities that was in conformance with regulatory requirements, commitments in the application and industry guides and standards. This inspection was a follow-up from the inspection that was documented in IIR 05000391/2014607 (ADAMS Accession No. ML1427A076). With respect to Unit 1 operations, these controls had been previously established and implemented by the licensee, and are inspected under the NRC reactor oversight process (ROP).

Inspection Activities: This inspection was performed in accordance with IMC 2513, titled "Light Water Reactor Inspection Program – Preoperational Testing and Operational Preparedness Phase," dated August 5, 2008, and based upon an NRC letter to TVA, dated November 8, 2013, titled "Watts Bar Nuclear Plant Unit 2 Construction – Operational Preparedness Inspection Plan," (ADAMS Accession No. ML13312A082) which described the scope of inspections for the inspection procedures listed in Appendix B of IMC 2513. Specifically, this inspection was performed to satisfy the requirements for Section II.2.b of IP 35746, "Procurement Control," dated October 1, 1976; which required a sampling of Unit 2 safety-related items that had been received, stored, and handled by the organization that would support Unit 2 once it became operational.

The inspectors reviewed a sample of procurement orders for recently purchased safety-related items that had been received on-site. The sample included items from the following categories: mechanical, electrical, instrument/electronic, and consumables.

The inspectors verified that the associated procurement documents were prepared in accordance with administrative controls; the items were purchased from qualified vendors; and the procurement documents contained requirements for the vendor/supplier to supply appropriate documentation of the quality, including component traceability. The inspectors also verified that the documentation was located with the procured items in the correct storage locations, and that the items were stored in accordance with the documentation requirements.

The inspectors also reviewed the open issues previously documented in IIR 05000391/2014607. The inspectors reviewed the construction contractor's "Evaluated Suppliers List" and the TVA "Acceptable Supplier List" (ACL) that had been identified as being different from each other, specifically that some of the vendors used for WBN Unit 2 construction were not on TVA's ACL. The inspectors reviewed supplier lists and interviewed Procurement and QA personnel, both from the applicant and the construction contractor. The inspectors noted that although the lists were different, no supply parts purchased for Unit 2 construction came from suppliers that were not on the TVA ACL. The extra suppliers on the contractors' list were not used for Unit 2 construction. In addition, the inspectors reviewed the procurement procedures that were required to qualify suppliers if they would be used for future purchases. The inspectors also reviewed "Watts Bar Nuclear Plant Operational Spares Strategy Document," and noted that it had been revised since the last inspection. The critical spares for WBN Unit 2 had been identified based upon the differences between WBN Unit 1 and WBN Unit 2. Purchases were being performed for those spares necessary for WBN Unit 2 startup and operation.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based upon the review of the sample and the programmatic process review, the inspectors concluded that TVA had adequately planned to transition from a single unit to a dual unit procurement control program. No further inspection is required for adequate implementation of IP 35746. IP 35746 is closed.

O.1.2 (Closed) Quality Assurance Program - Maintenance (Inspection Procedure 35743)

a. Inspection Scope

Background: This IP provided guidance to the inspectors to verify the applicant had developed and implemented a QA Program, relating to maintenance activities, that was in conformance with proposed TS, regulatory requirements, commitments in the application, and applicable industry guides and standards. This inspection was a follow-

up from the inspection that was documented in IIR 05000391/2015603 (ADAMS Accession No. ML15124A921). With respect to Unit 1 operations, these controls had been previously established and implemented by the licensee, and are inspected under the NRC ROP.

Inspection Activities: This inspection was performed in accordance with IMC 2513, dated August 5, 2008, and based upon an NRC letter to TVA, dated November 8, 2013. Specifically, this inspection was performed to satisfy the requirements for Section II.2.c of NRC IP 35743, "Maintenance," dated January 1, 1982; which required the inspectors to verify that Unit 2 equipment was on a preventive maintenance master schedule and to verify that the required maintenance activities were performed and documented.

The inspectors reviewed the associated program documents and procedures for TVA nuclear power group (NPG) and for Unit 2 construction, which included the quality assurance plans, preventative maintenance, on-line work control, and the corrective action program. The inspectors performed interviews, reviewed program documents, and reviewed the work management schedules of preventive maintenance activities (PMs) for systems that had been completed and turned over to the operations department. The inspectors reviewed a sampling of Unit 2 equipment and systems as documented in the master list and verified that the PMs had been completed or credited as complete based upon previous work performed and documented as required per the applicant's work management process. The inspectors verified that the PMs were consistent with the vendors' recommendations.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based upon the review of the sample and the programmatic process review, the inspectors concluded that TVA had adequately planned to transition from a single unit to a dual unit maintenance program. No further inspection is required for adequate implementation of IP 35743. IP 35743 is closed.

O.1.3 (Closed) Quality Assurance Program – Surveillance Testing and Calibration Control (Inspection Procedure 35745)

a. Inspection Scope

Background: This IP provided guidance to the inspectors to verify the applicant had developed and implemented programs for control and evaluation of: (1) surveillance testing, calibration, and inspection required by proposed TS, in-service inspection of pumps and valves as described in 10 CFR 50.55a.(g); and (2) calibration of safety-related instrumentation not specifically controlled by TS. This inspection was a follow-up from the inspection that was documented in IIR 05000391/2015603 (ADAMS Accession No. ML15124A921). With respect to Unit 1 operations, these controls have been

previously established and implemented by the licensee, and are inspected under the NRC ROP.

Inspection Activities: The inspection was performed in accordance with IMC 2513, dated August 5, 2008, and based upon an NRC letter to TVA, dated November 8, 2013. Specifically, this inspection was performed to satisfy Sections II.1.b and II.2.b of IP 35745, "Surveillance Testing and Calibration Control," dated April 1, 1979, which required the inspectors to verify: (1) Unit 2 surveillance tests required by TS were included in a master schedule and that the planned schedule was in accordance with the requirements of the TS; and (2) safety-related plant instruments which were not specifically required to be calibrated by TS had been included in a master calibration program, calibration procedures had been prepared and approved, and that calibration of the instruments had been performed.

For Section II.1.b., the inspectors verified that a master schedule for Unit 2 surveillance tests required by TS had been established. The inspectors also verified that the surveillance frequency and applicable Mode tied to surveillance completion was consistent with the applicable TS. The inspectors verified that the surveillance procedures were consistent with the requirements of the TS. For Section II.2.b., the inspectors verified that the calibration requirements had been established for safety-related plant instruments which were not specifically required to be calibrated by TS. The inspectors verified safety-related instruments were included in a master calibration program. The inspectors verified that the calibration procedures have been prepared, approved, and consistent with vendors' requirements. The inspectors also verified that the calibration of the instruments had been performed and documented in accordance with the applicant work management process. For both IP sections, the inspectors performed interviews with the dual-unit work control center personnel and verified that the surveillances and calibrations were on the work management schedule for their next scheduled performance.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based upon the review of the sample and the programmatic process review, the inspectors concluded that TVA had adequately planned to transition from a single unit to a dual unit surveillance testing and calibration program. No further inspection is required for adequate implementation of IP 35745. IP 35745 is closed.

IV. OTHER ACTIVITIES

OA.1.1 (Discussed) Electrical Issues CAP - Sub-issue: Cable Separation and Electrical Isolation (Temporary Instruction 2512/020)

a. Inspection Scope

Background: The bases for the cable separation requirements for WBN are the Institute of Electrical and Electronics Engineers (IEEE) 279-1971, IEEE 308-1971, and Regulatory Guide (RG) 1.6. The applicant determined that examples of redundant divisions of enclosed raceways existed with less than the minimum required 1-inch separation. This sub-issue was divided into three categories:

- Separation between redundant divisions of Class 1E raceways,
- Internal panel separation between redundant enclosed divisions of Class 1E cables,
- Coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E circuits.

In prior NRC inspections, IIR 05000391/2011602 – Section OA.1.5 (ADAMS Accession No. ML110800483), IIR 05000391/2011608 – Section OA.1.8 (ADAMS Accession No. ML11311A082), and IIR 05000391/2013604 – Section OA.1.29 (ADAMS Accession No. ML13179A079), NRC inspectors gathered a limited sample demonstrating adequate separation internal to control panels and between raceways containing redundant divisions of Class 1E circuits. However, in IIR 05000391/2014605 – Section OA.1.2 (ADAMS Accession No. ML14226A049), inspectors observed that the completed installation for conduit 2VC6034A installed under closed WO 113325528 failed to maintain the required 1-inch minimum separation with different divisional conduits.

Inspection Activities: The inspectors reviewed work orders to verify that documented work activities ensured compliance with separation requirements identified in TVA design criteria WB-DC-30-4, “Separation / Isolation”. The inspectors conducted walk-downs of the proximity between conduit pairs to verify that reworked conduits were properly installed in relation to separation between redundant divisions of Class 1E raceways.

The inspectors reviewed the following conduit pairs and WO packages in order to assess their quality and adequacy and to ensure that physical separation requirements were implemented:

- 2VC2039A/2PM6396G (WO 113325343)
- 2VC4456B/2PM6396G (WO 114655552)
- 2VC4432B/2PM6619A (WO 113427588)
- 2PM7214D/MC635A (WO 111123610)
- 2VC4432B/2VC4421A (WO 113427588)

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Additional field observations of completed work are recommended to demonstrate that physical separation and electrical isolation requirements have been met. Therefore, the inspectors concluded that this Sub-Issue will remain open until a larger sample of conduits can be inspected.

OA.1.2(Discussed) Construction Deficiency Report 05000391/89-08: Kapton Insulated Pigtail Insulation Damage (Inspection Procedure 51053)

a. Inspection Scope

Background: The historical concern that primary containment electrical penetrations containing Kapton insulated pigtails were found with nicks in the insulation, such that their ability to support the safety function of the serviced load or signal, was initially reported to the NRC on August 25, 1989, in accordance with 10 CFR Part 50.55(e) as a condition adverse to quality report (CAQR) WBP 890302 for Unit 1 and CAQR WBP 89436 for Unit 2. The follow-up final report associated with the notification (ADAMS Accession No. ML073551006) was transmitted by letter dated September 25, 1989, and identified the apparent cause, safety implications, and planned or completed corrective actions. By letter dated April 30, 1993 (ADAMS Accession No. ML073241164), the applicant changed the original commitment, which required quality control (QC) inspection of all penetration pigtail wires for damage, to state that appropriately trained modifications personnel utilizing a two-party inspection process would be used instead.

The background on this issue is discussed in further detail in Section OA.1.4 of IIR 05000931/2014607 (ADAMS Accession No. ML14274A076).

Inspection Activities: The inspectors observed qualified Kapton inspectors performing quality inspections of the individual strands comprising the Kapton insulation system for 2-PENT-293-0038-D (inboard and outboard) and 2-PENT-293-0008-A (inboard). The inspectors also observed repairs resulting from the inspections to verify that proper procedures were followed.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors concluded that the inspection performed and the portions of the repairs observed were adequate. Additional samples will be inspected.

OA.1.3 (Discussed) Generic Letter 89-10: Safety-Related Motor Operated Valve Testing and Surveillance (Temporary Instruction 2515/109 and Inspection Procedure 51053)

a. Inspection Scope

The inspectors observed applicant activities in response to GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance." The inspectors performed Part 2 inspections as documented in TI 2515/109. The inspectors performed these reviews to determine if the applicant had established and was implementing a program that will ensure the proper performance of MOVs in safety-related systems. The inspectors observed dynamic MOV diagnostic tests for the following GL 89-10 MOVs:

- 2-FCV-63-0006;
- 2-FCV-63-0007;
- 2-FCV-63-0008;
- 2-FCV-63-0011; and
- 2-FCV-63-0047.

For these MOVs the inspectors reviewed the test activities to determine if they were properly controlled and handled. To make those determinations, the inspectors reviewed work instructions, applicable design specifications, calculations, system descriptions, work packages, and approved procedures. The inspectors reviewed applicable MOV sizing calculations to determine if the applicant adequately sized the MOVs in accordance with GL 89-10 and if the switch settings were consistent with the expected design basis conditions for operation of the valve.

During the observance of these tests, the inspectors determined if:

- test personnel accomplished activities in accordance with the applicable test procedure and work instructions;
- fluid pressure, differential pressure, and flow adequately replicated applicable design basis conditions;
- measuring and test equipment used during the test was properly identified, traceable, and within the current calibration interval;
- measuring and test equipment was suitable for the application, was used within the calibrated range, and was recorded in the applicable work orders;
- test results were recorded during the activity; and
- test discrepancies were properly identified for resolution.

The inspectors reviewed MOV thrust and torque capability engineering calculations for five MOVs listed above to determine if the:

- actuator selections were in compliance with applicable site specifications and design requirements;
- design inputs for design basis operating conditions (such as temperature, flow, and pressure – including differential pressure) were consistent with the applicable system description and the Final Safety Analysis Report;

- calculations complied with design standard DS-M18.2.22, TVA Mechanical Design Standard for MOV Design Basis and Joint Owner's Group (JOG) Review Methodologies, Revision 6; and
- calculations complied with design standard DS-M18.2.21, Mechanical Design Standard for Motor Operated Valve Thrust and Torque Calculations, Revision 21.

The inspectors previously reviewed applicant actions to address GL 89-10; therefore, this inspection was a limited scope inspection of the requirements of this TI. In accordance with requirements of TI 2515/109, Revision 4, the inspectors evaluated and answered the questions for Part 2 of the TI as documented in the Observations and Findings section below: Questions 04.04 through 04.11.

The following samples were inspected:

- IP 51053, Section 02.02.g – 5 samples

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

In accordance with requirements of TI 2515/109, Revision 4, the inspectors evaluated and answered the following questions for Part 2 of the TI:

Part 2, Verification of Program Implementation:

For a sample of MOVs from the population of MOVs in the generic letter program:

- 04.04 Select a sample of MOVs for detailed review from the population of MOVs in the generic letter program.

The inspectors sampled five GL 89-10 MOVs, 2-FCV-63-0006, 2-FCV-63-0007, 2-FCV-63-0008, 2-FCV-63-0011, and 2-FCV-63-0047, to review as part of this inspection. Based on the previous samples obtained as documented in IIRs 05000391/2011608 (ADAMS Accession No. ML11311A082, 2 samples), 05000391/2013610 (ADAMS Accession No. ML14049A158, 2 samples), 05000391/2014615 (ADAMS Accession No. ML15044A424, 1 sample), and this report (5 samples), the inspectors determined that the sample requirements contained in Section 05.02.k of the TI have been met.

- 04.05 Verify that the licensee has performed design-basis reviews of the sampled MOVs consistent with the generic letter or its commitments (where accepted under Part 1), as appropriate.

The inspectors determined that the applicant's design basis review was adequate for the sampled valves.

- 04.06 Verify that the licensee has adequately sized the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as

appropriate. Verify that switch settings are consistent with the expected design conditions for operation of the valve.

The inspectors verified that the applicant properly sized the sampled MOVs and that the limit and torque switch settings were appropriate. The inspectors verified the adequacy of the engineering design was completed in accordance with applicable site specifications and design criteria. The inspectors reviewed the applicable thrust/torque and actuator capability engineering calculations for the sampled MOVs to ensure that the applicant had appropriately sized the actuators. The inspectors observed dynamic MOV testing on the sampled valves and determined that the applicant appropriately set the limit and torque switches.

- 04.07 Verify that the licensee has demonstrated the design-basis capability of the sampled MOVs and the adequacy of the licensee's program applied to the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

The inspectors reviewed the reconciled MOV calculation(s) for the sampled MOV(s) and determined that the applicant adequately incorporated the dynamic test results into the calculation(s). The valve factor and rate of loading used in the calculations exceeded the values obtained during dynamic testing. Design assumptions were conservative and the applicant effectively demonstrated adequate margin for actuator capability under worse case accident scenarios.

- 04.08 Verify that the licensee has established a method for periodic verification of adequate capability of the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

This will be verified during inspection activities for GL 96-05.

- 04.09 Verify that the licensee has analyzed MOV failures which have occurred and has an effective corrective action plan to prevent reoccurrence and the licensee trends failures of MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

The applicant maintained established procedures, which were common to all TVA nuclear units including Watts Bar Unit 2, to analyze MOV failures. The inspectors determined that these procedures were adequate.

- 04.10 Verify that the licensee is meeting the program schedule in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

This item is not applicable for Watts Bar Unit 2 because the unit is under construction.

- 04.11 Verify quality assurance program implementation in the design control and testing of the sampled MOVs.

Based on the activities inspected, the inspectors determined that the applicant was properly implementing their quality assurance program with regards to Unit 2 GL 89-10 MOVs.

Based on the results of this inspection and previous inspections documented above, the inspectors concluded that all inspection activities for Part 2 of this TI are complete.

c. Conclusions

Based on the activities reviewed, MOV testing was conducted by qualified individuals using qualified procedures, design calculations were performed in accordance with applicable specifications, and the applicant was adequately implementing GL 89-10 requirements. Because Watts Bar Unit 2 has not operated yet, the applicant has not fully established a GL 89-10 program; therefore, the requirements of GL 89-10 have not been fully implemented and additional inspection activities are required to complete this TI. These activities include additional samples for Part 3 requirements of this TI. Based on this limited review and the remaining actions by the applicant, no additional conclusion is warranted for this inspection.

OA.1.4 (Discussed) Generic Letter 2004-02 - Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors and Pressurized Water Reactor Containment Sump Blockage (Temporary Instruction 2515/166)

a. Inspection Scope

Background: GL 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors", requested licensees to evaluate the emergency core cooling system (ECCS) and containment spray systems (CSS) recirculation functions and take actions, if appropriate. Pressurized water reactor recirculation sump screens have been identified to be potentially susceptible to debris blockage during design basis accidents requiring recirculation operation of ECCS or CSS and on the potential for additional adverse effects due to debris blockage of flow paths necessary for ECCS and CSS recirculation and containment drainage.

In response to the generic letter mentioned above, WBN determined that they would remove the outer trash racks provided on each side of the sump and install a new Sure-Flow® strainer. The new strainer has an available flow area of 4600 ft² compared to the original screen area of approximately 200 ft². The new strainer openings are 0.085 inches in diameter compared to the 0.25 inch mesh that cover the outer trash racks. The Sure-Flow® strainer has an advanced configuration intended to be much more resistant to potential sump blockage.

Unit 2 containment is a mirror image to Unit 1's containment. Therefore, the results of debris generation, transport analyses, and downstream effects will be the same for Unit 2 as for Unit 1. The WBN Unit 2 letter to the NRC dated March, 4, 2011 (ADAMS Accession No. ML110680248) stated that Unit 2 actions are to replace containment sump intake screens with an advanced design containment sump strainer arrangement under Engineering Document Construction Release (EDCR) 53580. The design is the same as that used for Unit 1 except that the strainer stack to plenum opening was increased in size. This change reduces the strainer pressure drop, thus increasing the margin to plugging the strainer when compared to Unit 1.

Inspection Activities: The inspectors performed a walkdown of the containment sump strainer assembly 2-STN-063-0200. Specifically, the inspectors reviewed WOs associated with the installation of the containment sump strainer assembly, plenum, and support beams as well as their respective construction drawings to determine if:

- the maximum 0.085" gap, allowed by design, was attained throughout the components and instrument penetrations of the strainer assembly;
- the as-built configuration of the strainer was in conformance with the construction sequence described on the work orders;
- as-built dimensions were within the tolerances required by construction drawings and specifications; and
- installation and torqueing of connections was properly documented and controlled by quality control inspections.

In addition, the inspectors reviewed certificates of conformance, installation procedures, and EDCRs to verify if construction activities were completed and programmatically controlled in response to GL 2004-02.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the activities reviewed, the inspectors concluded that the installation of the containment sump strainer assembly was completed in accordance with the as-built configurations reflected in construction drawings and specifications. This item will remain open pending review of related calculations, review of the final coatings walkdown report, review of drawings and calibration reports associated with the sump level indicator and sump radiation monitoring device, and a final walkdown of the containment sump.

OA.1.5(Closed) Temporary Instruction 2515/191: Followup on Fukushima Orders for Watts Bar and Inspection of the Licensee's Responses to Mitigation Strategies Order EA-12-049, Spent Fuel Pool Instrumentation Order EA-12-051 and Emergency Preparedness Information Requested in NRC March 12, 2012

a. Inspection Scope

Background: On March 12, 2012, the NRC issued Mitigation Strategies Order EA-12-049, (ADAMS Accession No. ML12054A735) requiring all U.S. nuclear power plants to implement strategies that will allow them to cope without their permanent electrical power sources for an indefinite amount of time.

The Order was issued in response to the Fukushima accident. The NRC created a task force of senior NRC staff that reviewed the circumstances of the event to determine what lessons could be learned. In July 2011, the task force provided recommendations to enhance U.S. reactor safety; these became the foundation of the NRC's post-Fukushima activities.

These diverse and flexible coping strategies (also known as FLEX) are expected to use a combination of currently installed equipment (e.g., steam-powered pumps), additional portable equipment that is stored on site, and equipment that can be flown in or trucked in, to maintain the proper cooling temperature for the reactor core and spent fuel.

On July 15, 2013, TVA submitted a letter (ADAMS Accession No. ML13206A383) to the NRC updating their FLEX strategy plans to comply with NRC Order EA-12-049.

Since that time, TVA has implemented several of these actions, made modifications to the plant, and introduced new equipment. The NRC has witnessed and inspected a sampling of these modifications as noted below. The inspections centered on critical design and structural attributes. Additionally, inspections were performed of as-built and completed modifications to verify that specifications, drawings, requirements, and standards were met.

Several of these inspections for Unit 2 have been documented in IIRs:

- 05000391/2014604 (ADAMS Accession No. ML14177A214)
- 05000391/2014605 (ADAMS Accession No. ML14226A049)
- 05000391/2014607 (ADAMS Accession No. ML14274A076)

Inspection Activities: Recent inspections for TI 2515/191 were conducted from March 30 to April 3, 2015 and documented in a separate inspection report numbered 05000390/2015609 and 05000391/2015616 (ADAMS Accession No. ML 15173A317). The inspectors reviewed the NRC inspection report which concluded that the inspection team had verified that plans for complying with NRC Orders EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12229A174) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044) are in place and are being implemented by the applicant. The inspection team had also verified that the applicant had implemented staffing and communications plans provided in response to the March 12, 2012, request for information letter and multi-unit dose assessment information provided per COMSECY-13-0010, Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013 (ADAMS Accession No. ML12339A262).

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on completion of earlier inspections of plant modifications to implement diverse/flexible coping strategies and the completion of TI 2515/191, the NRC has completed its inspection of post Fukushima activities as related to construction inspections for Unit 2.

OA.1.6 (Discussed) Generic Letter 2006-02: Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power (Inspection Procedure 92701)

a. Inspection Scope

Background: GL 2006-02 “Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power” (ADAMS Accession No. ML060180352) was issued on February 1, 2006, to determine if compliance was being maintained with regulatory requirements governing electric power sources and associated personnel training. The NRC completed a safety evaluation (ADAMS Accession No. ML100080768) of TVA’s response to GL 2006-02 for Unit 2. The SER, dated January 20, 2010, concluded that TVA’s response and regulatory commitments made for GL 2006-02 were acceptable. The report also indicated that prior to closing out the review of TVA’s response to this GL for Unit 2, the following would be required:

- independent verification that the regulatory commitments discussed have been met, and
- a review of the associated electrical design calculations for WBN Unit 2.

IIR 05000391/2014608 Section OA.1.5 (ADAMS Accession No. ML14322A182) previously addressed this issue.

Inspection Activities: The inspectors reviewed the current version of calculation EDQ00099920070002 Rev. 43 to verify the adequacy and functionality of the auxiliary power system to support dual unit operations. The inspectors reviewed TVA-SPP-10.010, Rev. 4, NERC Standard Compliance Processes Shared by TVA’s Nuclear Power Group and Transmission Organizations, dated March 24, 2014, to understand operation protocols in place between WBN and the power system operator (PSO).

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors identified that additional inspection is required. Specifically, inspection of the updated PSO offsite power grid analysis, WB2/PSO protocols and implementing procedures, and procedures for offsite power restoration. This item will remain open.

OA.1.7 (Closed) Three Mile Island Action Item II.D.3 – Direct Indication of Relief-and Safety-Valve Position and Supplemental Safety Evaluation Report Appendix HH Item 074: Installation of the Acoustic Monitoring System for the Power Operated Relief Valves (Inspection Procedure 92701)

a. Inspection Scope

Background: This Three Mile Island (TMI) action item requires that RCS relief and safety valves have positive indication of valve position in the main control room and that indication is derived from a reliable valve-position detection device or a reliable indication of flow in the discharge pipe. The inspectors had previously documented their review of actions to address this item in IIR 05000391/2014608 (ADAMS Accession No. ML14322A182).

Inspection Activities: During this inspection period, the inspectors reviewed the overall status of the actions to comply with the subject TMI action item. The inspectors reviewed drawings and conducted walkdowns with responsible staff to verify the installation of the acoustic monitoring system components and pressurizer relief tank (PRT) condition sensors, and to verify indications are provided in the main control room; in accordance with TVA's overall response to this TMI action item. This review included:

- temperature downstream of the power-operated relief valves (PORVs)
- PORV direct valve position indication light
- PRT temperature
- PRT pressure
- PRT fluid level
- acoustic monitoring display
- sealed piezoelectric accelerometers
- charge converters
- control room display components

The inspectors reviewed the work performed under WOs 110800410, 114834946, 114853758, 113474274, 113576853, and 116574299 associated with the acoustic monitoring system of the pressurizer safety relief valves and PORVs to verify installed wiring for the monitoring and indication systems. The inspectors used drawing 2-47W813-1, Rev. 33 to identify installed components. The inspectors visually verified the completed installation of the sealed piezoelectric accelerometers on the downstream piping of the two pressurizer PORVs: 2-XE-68-334 and 2-XE-38-68-340A. Installed components for PRT temperature 2-TE-68-309, pressure 2-PT-68-301/2-PT-68-311C and tank level 2-LT-68-300/2-LT-68-312C indications were visually verified. The inspectors reviewed manufacturer drawings and installation instructions to verify the adequacy of installed equipment configurations.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified. All components necessary to drive the signals for these indications were installed.

c. Conclusions

The inspectors determined that TVA had completed the installation, including wiring and connections for WBN Unit 2 TMI action item II.D.3 – Direct Indication of Relief and Safety Valve Position and SSER Appendix HH Item 074: Installation of the Acoustic monitoring system for the Power Operated Relief. Therefore, these items are closed.

OA.1.8 (Closed) Generic Letter 79-36, Adequacy of Station Electric Distribution System Voltages (Inspection Procedure 92701)

a. Inspection Scope

Background: As indicated in the NRC GL 79-36, all licensees are required to review the electric power systems at each of their nuclear power plants to determine analytically if, assuming all onsite sources of alternating current power are not available, the offsite power system and the onsite distribution system is of sufficient capacity and capability to automatically start as well as operate all required safety loads. This includes the protection of safety loads from undervoltage conditions, designed to provide the required protection without causing voltages in excess of maximum voltage ratings of safety loads and without causing spurious separations of safety buses from offsite power. In order to address dual unit operation a separate analysis should be performed for each unit assuming (1) an accident in the unit being analyzed and simultaneous shutdown of all other units at the station; or (2) an anticipated transient in the unit being analyzed and simultaneous shutdown of all other units at the station, whichever presents the largest load demand situation.

Inspectors previously reviewed several calculations and documents associated with electrical distribution system voltages for dual unit operations with followup interviews with responsible staff from the electrical and mechanical design groups to address required clarifications. The previous reviews were documented in IIR 05000391/2011612, Section E.1.1 (ADAMS Accession No. ML11348A081), 05000391/2014605, Section OA.1.5 (ADAMS Accession No. ML14226A049), and 05000391/2014608, Section OA.1.8 (ADAMS Accession No. ML14322A182).

Inspection Activities: The inspectors reviewed and discussed voltage drop studies, calculations, maximum distribution equipment loading, motor block starting during safety injection (SI) signal loading for containment phases A and B isolation conditions, feeder and circuit wire sizes, cable temperature ratings and current capacities, control circuit protection integrity, motor block starting under SI signal with concurrent degraded voltage conditions, load shedding and load restoration from degraded voltage and loss of voltage conditions. This review was to verify equipment performance to maintain

adequate station electric distribution system voltages and to establish the adequacy and functionality of the auxiliary power system to support dual unit operation.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors concluded that the calculations and information provided for dual unit operation analysis with a unit experiencing accident conditions and simultaneous shutdown of the other unit as required by the GL were addressed adequately. GL 79-36 is closed.

OA.1.9 (Closed) Unresolved Item 05000391/2014614-01, Potential failure to comply with 10 CFR 50.55a and Properly Implement the Scope of the ASME OM Code, Associated with Generic Letter 89-04: Guidance on Developing Acceptable In-Service Testing Programs; Temporary Instruction 2515/114: Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs; Temporary Instruction 2515/110: Performance of Safety-Related Check Valves

a. Inspection Scope

Background: During the initial inspection of TVA's inservice testing (IST) program to support dual unit operations, inspectors identified URI 05000391/2014614-01 (ADAMS Accession No. ML14363A315), Potential Failure to Comply with 10 CFR 50.55a and Properly Implement the Scope of the ASME Operation and Maintenance (OM) Code. The inspection noted that the safety injection cold leg accumulator isolation valves and nitrogen charging isolation valves (FCV-63-67, FCV-63-80, FCV-63-98, FCV-63-118, FCV-63-63, FCV-63-87, FCV-63-107, and FCV-63-127) were classified as passive in the TVA IST program. As a result of this classification, the program planned to verify position of these valves remotely every two years. Valves classified as active, however, per ASME OM Code 2004, 2006 Addenda, are required to be stroke time tested. TVA's IST program did not include a justification for classifying these valves as passive instead of active. In addition, the inspectors identified several emergency operating procedures where the valves are required to be repositioned in order to prevent excessive quantities of nitrogen from being injected into the RCS during a post-accident condition. Furthermore, the emergency response guidelines, provided by the vendor, documented that the injection of nitrogen could inhibit natural circulation or lead to RCS pressure control difficulties. As a result, further review was required for clarification/interpretation of the existing application of the ASME OM code.

Inspection Activities: The NRC Office of Nuclear Reactor Regulation (NRR) staff reviewed TVA's IST program to determine if the ECCS accumulator isolation valves met

the requirements of 10 CFR Part 50.36, 50.55a, and the ASME OM Code, to be classified under a maintenance designation of passive. The NRC NRR staff documented their review in a letter to the NRC regional staff (ADAMS Accession No. ML15140A441).

In addition, the NRR staff reviewed the Watts Bar Unit 2 TS, the normal operating procedures, the safe shutdown requirements, the Watts Bar Updated Final Safety Analysis Report, and the Westinghouse analysis WCAP-9601, "Report on Small Break Accidents for Westinghouse NSSS Systems," Volumes I – III. The review was conducted to verify the potential nitrogen gas injection into the RCS system, while the plant was cooling down from MODE 3 to MODE 4 at a fixed rate with an open accumulator isolation valve, was properly analyzed. The staff reviewed the WCAP-9601 analysis to verify that the non-condensable gas, caused by the nitrogen addition into the RCS through the open accumulator valves, would not disrupt core cooling from either a hydraulic or thermal perspective.

b. Observations and Findings

No findings were identified.

The inspection reviewed TVA's position that the accumulator isolation valves were passive due to the valves being in their open safety position with power removed. These valves are included in the TS surveillance requirements (SRs) for Watts Bar Unit 2 and verify that the accumulator isolation valves are fully opened every two hours and that power is removed from each accumulator isolation valve when the pressurizer pressure is greater than 1000 psig every 31 days. The SRs indicate that the accumulator isolation valves are to remain open and de-energized while in MODE 1 and while transitioning to MODE 3. Therefore, the inspection determined that in order to reach hot standby (the safe shutdown condition) the accumulator isolation valves are not required. The IST program met the requirement of 10 CFR Part 50.36, 50.55a, and the classification of the valves met the definition of the ASME OM Code for passive valves.

The inspection reviewed the impacts of the accumulator isolation valves on the RCS. The inspection found that when the reactor is in hot standby, Mode 3, the accumulator isolation valves will remain open, the accumulators would not inject into the RCS. This is due to the RCS pressure remaining above the pressure of the accumulators.

The inspection reviewed the impacts of the accumulator isolation valves on the emergency operating procedures (EOPs) for emergency shutdown. In the EOPs, the accumulator isolation valves are listed as needed for emergency shutdown, but not all of those procedures are required for safe shutdown. The requirements for safe shutdown do not credit or list the accumulator isolation valves. Therefore, the accumulator isolation valves are not required for safe shutdown for Watts Bar Unit 2.

The inspection identified that while the plant is in a controlled shutdown condition, cooling down at a fixed rate, there was a potential for an open accumulator isolation valve to inject cold borated water and nitrogen gas into the RCS when going from MODE

3 to MODE 4. It was found that prior to entry into MODE 4, the operators would take the action to isolate the accumulator isolation valves. Furthermore, in the event the operators were unable to isolate the accumulator isolation valves, the plant could safely remain in MODE 3, the safe shutdown condition.

The inspection identified that, when in MODE 4, the RCS pressure would be low enough to allow accumulator injection into the RCS. The inspectors reviewed the potential for pressurized thermal shock (PTS) and the potential for impacts resulting from nitrogen addition into the RCS. The inspection determined the injection of cold water from the accumulators would not result in a PTS event as defined by 10 CFR 50.61. The inspection also reviewed the Westinghouse analysis WCAP-9601. This analysis used a variety of break sizes with the assumption that accumulator nitrogen emptied into the RCS in a similar manner to the pressurizer vapor space calculation. The analysis also showed that most of the non-condensable gas dissolved in the accumulator water. As a result, the WCAP-9601 analysis concluded that a small amount of non-condensable gas would not disrupt core cooling from either a hydraulic or thermal perspective. Therefore, injection of nitrogen into the RCS from the accumulators would not disrupt core cooling during small break accidents.

c. Conclusions

URI 05000391/2014614-01, Potential Failure to Comply with 10 CFR 50.55a and Properly Implement the Scope of the ASME OM Code, is closed. The inspectors concluded that based on (1) the appropriate application of the ASME OM code, (2) the safe shutdown conditions for Watts Bar Unit 2, and (3) the review of the Westinghouse analysis WCAP-9601, the accumulator isolation valves can be designated as passive, and the concern for PTS and injection of nitrogen into the RCS from the accumulators was adequately analyzed.

GL 89-04 and associated TIs will remain open. TVA will complete preservice testing for each component in the IST program in accordance with the ASME OM code, and additional observations of these tests will be witnessed by the inspectors in order to close the GL and TIs.

OA.1.10 (Closed) Three Mile Island Action Item I.C.7 Nuclear Steam Supply System Vendor Review of Procedures (Inspection Procedure 92701)

a. Inspection Scope

Background: TMI Action Item I.C.7 required the NSSS vendor (Westinghouse) review the licensee's startup test program, low power and power ascension procedures, and plant emergency procedures. This commitment was documented in TVA framework letter dated January 29, 2008, Watts Bar Nuclear Plant Unit 2 – Regulatory Framework for the Completion of Construction and Licensing for Unit 2 (ADAMS Accession No. ML080320443). The commitment was contained in Enclosure 2, Item 106, I.C.7, "NSSS

Vendor Revision of Procedures” – Revise power ascension and emergency procedures which were reviewed by Westinghouse.

For Unit 1, Action Item I.C.7 was closed in NRC Inspection Reports 50-390/85-08 and 50-391/85-08 (ADAMS Accession No. ML082190701). The inspectors documented that the applicant had implemented the Westinghouse Owner’s Group generic emergency procedures, which had been approved by NRC staff. Unit 1 actions were further explained in TVA letter to NRC dated July 27, 1992 (ADAMS Accession No. ML073520471). This letter explains that the WBN EOPs conform to the Westinghouse generic guidelines and that WBN no longer depends on EOPs developed by identifying differences between Sequoyah Nuclear Plant and WBN. In Supplement 10 to the Safety Evaluation Report for Watts Bar Nuclear Units 1 and 2 (ADAMS Accession No. ML072060473) dated October, 1992, the NRC staff indicated that WBN procedures conformed to the Westinghouse Owner’s Group guidelines and that the license condition was no longer necessary.

Inspection Activities: The inspectors reviewed the applicant’s final closure package to verify that the intent of TMI Action Item I.C.7 had been met for WBN Unit 2. The inspectors reviewed a list of the 39 power ascension and low power procedures required for Unit 2 start-up. Procedures had been developed, had independent qualified reviews, and had been approved by the Plant Operating Review Committee Test Review Group (TRG). The inspectors reviewed an audit report created for each procedure to verify reviews were performed, and had Westinghouse representation. The inspectors reviewed technical instruction 2-TI-439, “Test Review Group”, Rev. 2, to verify that a Westinghouse representative is required to be a review member of the TRG.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

No findings were identified.

c. Conclusions

Based on the above activities and review of the final closure package, the inspectors determined that the NSSS vendor has provided reviews of low power and power ascension test procedures. In addition, WBN emergency procedures conform to the Westinghouse Owner’s Group guidelines. TMI Action Item I.C.7 is closed.

OA.1.11 (Closed) Unresolved Item 05000391/2015603-4, Boric Acid Tank C Design Control

a. Inspection Scope

Background: The inspectors identified discrepancies with control room alarm response procedure, 2-ARI-109-115, Rev. 5U2 for annunciator 112-A, “BAT C Level Hi/Lo,” and calculation CN-SUA-10-07, “Watts Bar Unit 2 Boric Acid Tank Level Setpoint and

Scaling Document (SSD) Supporting Calculation Note,” Rev. 1. This error applied to Unit 1 and Unit 2.

In addition, the inspectors also identified discrepancies with calculation EPMPDM071197, “Boric Acid Concentration Analysis for BAT and RWST,” Rev. 8, Appendix E, “Justification of Applicability to Unit 2 Operation,” and Calculation CN-SUA-10-7, “Watts Bar Unit 2 Boric Acid Tank Level Setpoint and Scaling Document Supporting Calculation Note.” This issue was documented as URI 05000391/2015603-4, “Boric Acid Tank C Design Control.” (ADAMS Accession No. ML15124A921)

Inspection Activities: The inspectors performed interviews and reviewed corrective action documents, revised calculations, and procedures to determine the impact of the calculation errors.

Documents reviewed are listed in the Attachment.

b. Observations and Findings

The inspectors determined that the errors identified in the calculations and annunciator procedures did not impact safety-related equipment or personnel safety.

c. Conclusions

The applicant captured this concern in their corrective action program under PERs 1007729, 1008723, and 1009641 and subsequently revised the alarm response procedures and calculation to correct the errors. There was no violation of NRC requirements identified. No further inspection is required; URI 05000391/2015603-4 is closed.

OA.1.12 Followup and inspection of NRC Office of Investigation Report 2-2014-017

a. Inspection Scope

The inspectors reviewed the NRC Office of Investigations (OI) Report 2-2014-017, which was related to compliance with anchor bolt installation procedures.

b. Observations and Findings

Introduction: On April 9, 2015, the NRC OI completed an investigation to determine whether on or about December 1, 2011, Bechtel employees, while working at WBN Unit 2, deliberately failed to follow anchor bolt installation procedures. The OI investigation concluded that two Bechtel employees, former pipefitters at WBN Unit 2, deliberately violated TVA procedural guidelines when they damaged rebar during drilling activities.

Description: On November 13, 2013, the NRC received information that procedural requirements associated with the installation of anchor bolts were being violated at WBN2. Specifically, Bechtel pipefitters had damaged rebar by drilling through or into the

rebar to install the anchor bolts. The area of concern was associated with the holes drilled into the steam generator (SG) housing walls for anchor bolt installation associated with unistrut supports for SG snubber oil reservoir lines.

TVA Procedure MAI-5.1B, Wedge Bolt (WB) Anchor Installation, Revision 21, is the implementing/controlling process for anchor bolt installation, and includes the requirements for drilling the hole to be used for anchor bolt installation. MAI-5.1B, Revision 21, Section 6.2.5.A.3, states that unless specifically permitted, reinforcing steel shall not be cut or drilled to install anchors. Site Engineering approval is required to drill through the reinforcing bar. Based on the evidence developed during the investigation, NRC OI substantiated that Bechtel employees deliberately failed to follow procedure MAI-5.1B. The NRC review found that during anchor bolt installation associated with unistrut supports for SG snubber oil reservoir lines, a Bechtel employee had encountered rebar when drilling. Employees with knowledge of this incident did not report to Site Engineering for approval to drill into the reinforcing bar. The employees reconfigured the drill by obtaining a drill bit that could intentionally drill through the reinforcing steel without engaging the drill stop. The incident was not documented in TVA work orders.

After receiving information from the NRC about this issue, the applicant initiated PER 83861 to address this concern. TVA removed the suspect anchor bolts associated with WO 111335067 and confirmed damage to rebar in three locations. As part of the extent of condition evaluation, TVA reviewed a list of WOs performed by the same individuals. TVA determined that rebar was also damaged in two locations associated with WO 111335073. Each were evaluated by Engineering and determined not to require repair due to safety margin designed into the walls being enough to 'accept' the damage. In addition, TVA also 'accepted' possible damage to 25 other locations as a conservative measure even though there is no evidence that damage has occurred. This is because if TVA excavated these and there was evidence of damage, the engineering disposition would be to accept the damage without repair, thus the repair effort would not provide any safety benefit.

The inspectors determined that the failure to follow anchor bolt installation procedures was a performance deficiency. The performance deficiency is considered to be more than minor in accordance with IMC 2517 because it represents an inadequate work process that if left uncorrected, could adversely affect the quality of the construction, testing, analysis, or records of a safety-related SSC. Specifically, unreported or unanalyzed damage to reinforcing bar could adversely affect the quality of construction of a safety-related SSC. The inspectors reviewed this finding against cross-cutting area components as described in IMC 0310, "Components Within the Cross-Cutting Areas" and determined that no cross-cutting aspect applied.

Enforcement: 10 CFR 50, Appendix B, Criterion V, *Instructions, Procedures, and Drawings*, requires that activities affecting quality shall be prescribed by documented

instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

TVA Procedure MAI-5.1B, Wedge Bolt (WB) Anchor Installation, Revision 21, is the implementing/controlling process for anchor bolt installation, and includes the requirements for drilling the hole to be used for anchor bolt installation.

MAI-5.1B, Revision 21, Section 6.2.5.A.3, states that unless specifically permitted, reinforcing steel shall not be cut or drilled to install anchors. Site Engineering approval is required to drill through the reinforcing bar.

Contrary to the above, on or about December 1, 2011, contract employees assigned to drill holes for anchor bolt installation willfully drilled into the reinforcing steel of the steam generator housing, a safety-related structure, without notifying Site Engineering, or obtaining their approval as required by TVA Procedure MAI-5.1B. Specifically, the contract employees damaged reinforcing steel in at least five locations associated with holes drilled under work order 111335067 and work order 111335073.

As discussed in the NRC Enforcement Policy, willful violations are a particular concern to the NRC. In this case, the NRC concluded that the actions of the pipefitters were willful. In reaching this conclusion, the NRC noted that during transcribed interviews with NRC's OI representatives, both individuals involved were trained in the anchor bolt installation procedures and did not lack an understanding or knowledge of the procedure. The involved individuals acted deliberately when they violated the procedure to drill into rebar.

In consideration of the fact that the individuals were craft laborers with no supervisory responsibilities, and that the damage to the structure was evaluated and determined not to require repair, the NRC concluded that this violation should be characterized at Severity Level IV. Furthermore, because this violation was not the result of an isolated action of one employee, and was not identified by the applicant, the non-cited violation criteria of paragraph 2.3.2.a.4.(a) and (c) were not satisfied, such that this violation will be cited.

This is identified as violation (VIO) 05000391/2015604-02, Failure to Follow Anchor Bolt Installation Procedure.

c. Conclusions

Further inspection of this issue will be required after receipt of the applicant's written response to the NOV.

V. MANAGEMENT MEETINGS**X1 Exit Meeting Summary**

An exit meeting was conducted on May 28, 2015, to present inspection results to you and other members of your staff. Further discussion was conducted on June 19, 2015, with Mr. O'Dell. The inspectors identified that no proprietary information had been received during the inspection and none would be used in the inspection report. The applicant acknowledged the observations and provided no dissenting comments.