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

March 9, 2016

Mr. Michael D. Skaggs
Senior Vice President
WBN Operations & Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2016601

Dear Mr. Skaggs:

On January 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of construction and testing activities at your Watts Bar Unit 2 reactor facility. The enclosed integrated inspection report documents the inspection results, which were discussed on February 4, 2016, with Gordon Arent and other members of your staff. The inspection results were discussed further on February 19, 2016, with Paul Simmons and other members of your staff.

This inspection examined activities conducted under your Unit 2 operating license as they relate to safety and compliance with the Commission's rules and regulations, the conditions of your operating license, and fulfillment of Unit 2 regulatory framework commitments. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the enclosed report documents two NRC-identified findings which were determined to involve violations of NRC requirements. However, because the findings were all Severity Level IV violations and were entered into your corrective action program, the NRC is treating the violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the non-cited violations in the enclosed report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTENTION: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Watts Bar Unit 2 Nuclear Plant.

In accordance with 10 *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly

Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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

Sincerely,

/RA/

James Baptist, Chief
Reactor Projects Branch 8
Division of Reactor Projects

Docket No. 50-391
License No. NPF-96

Enclosure: Integrated Inspection Report 05000391/2016601
w/ Attachment

cc: w/encl: (See next page)

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cc: w/encl: (See next page)

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DATE	2/19/2016	2/25/2016	2/25/2016	2/22/2016	3/ /2016
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO
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OFFICIAL RECORD COPY DOCUMENT NAME: G:\DRPII\RPB8\WATTS BAR II\IR 2016601 FINAL.DOCX

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Letter to Michael D. Skaggs from James Baptist dated March 9, 2016.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2016601

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-391
License No.:	NPF-46
Report No.:	05000391/2016601
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Unit 2
Location:	Spring City, TN 37381
Dates:	January 1, 2016 – January 31, 2016
Inspectors:	E. Patterson, Senior Resident Inspector, Reactor Projects Branch (RPB) 8, Division of Reactor Projects (DRP), Region II (RII) R. Monk, Resident Inspector, RPB8, DRP, RII J. Eargle, Resident Inspector, RPB8, DRP, RII C. Zoia, Operations Engineer, Operations Branch (OB), Division of Reactor Safety (DRS), Region III (Section SU.1.1) M. Speck, Senior Technical Training Program Specialist (Sections SU.1.2, SU.1.3, SU.1.8) P. Carman, Regional Inspector, Construction Inspection Branch (CIB) 3, Division of Construction Inspection, RII (Sections SU.1.4, SU.1.5)
Approved by:	James Baptist, Chief Reactor Projects Branch 8 Division of Reactor Projects

Enclosure

SUMMARY
Watts Bar Nuclear Plant, Unit 2

This integrated inspection included aspects of engineering and construction activities performed by Tennessee Valley Authority (TVA) associated with the Watts Bar Nuclear (WBN) Plant Unit 2 construction project. This report covered a one month period of inspections in the areas of quality assurance (QA), identification and resolution of construction problems, engineering and construction activities, preoperational and startup testing, and follow-up of other activities. The inspection program for Unit 2 construction activities is described in Nuclear Regulatory Commission (NRC) Inspection Manual Chapter (IMC) 2517, "Watts Bar Unit 2 Construction Inspection Program." Information regarding the WBN Unit 2 Construction Project and NRC inspections can be found at http://www.nrc.gov/info-finder/reactor/wb/watts-bar.html.

Inspection Results

- The NRC identified a Severity Level (SL) IV non-cited violation (NCV) of 10 *Code of Federal Regulations* (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," for the licensee's failure to follow procedural requirements for material traceability documentation of a safety-related work order (WO). The licensee failed to follow the material traceability requirements in Watts Bar Unit 2 Construction Completion Project Procedure 25402-000-GPP-0000-N6204, "Field Material Control and Traceability," Rev. 20. This violation was considered as traditional enforcement because it involved willfulness. The inspectors used the NRC Enforcement Policy, Section 6.5, and determined the issue to be of very low safety significance because the licensee failed to establish, maintain, or implement adequate controls over construction processes that are important to safety. However, this finding did not represent a breakdown in a licensee's QA program for construction related to a single work activity. Despite willfulness, NRC concluded that the criteria for a non-cited violation in Section 2.3.2.a.4 of the Enforcement Policy were met. The licensee entered this issue into the corrective action program in condition report (CR) 912264, which appropriately documented and resolved the hardware concern. The NRC reviewed this violation against cross-cutting area components as described in IMC 0310, and determined that no cross-cutting aspect applied. (Section OA.1.2)

- The NRC identified a SL IV NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information," for the failure to maintain complete and accurate material traceability information in a safety-related WO. The licensee failed to maintain complete and accurate material traceability information on Attachment B of WO 115856309. This violation was considered as traditional enforcement because it involved willfulness. The inspectors used the NRC Enforcement Policy, Section 6.5, and determined the issue to be of very low safety significance because the licensee failed to establish, maintain, or implement adequate controls over construction processes that are important to safety. However, this finding did not represent a breakdown in a licensee's QA program for construction related to a single work activity. Despite willfulness, NRC concluded that the criteria for a non-cited violation in Section 2.3.2.a.4 of the Enforcement Policy were met. The licensee entered this issue into the corrective action program in CR 912264, which appropriately documented and resolved the hardware concern. The NRC reviewed this violation against cross-cutting area components as described in IMC 0310, and determined that no cross-cutting aspect applied. (Section OA.1.2)

- Other areas inspected were adequate with no findings identified. These areas included QA; preoperational testing activities; startup testing activities; and in-service testing program activities.

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REPORT DETAILS

Summary of Plant Status

During the inspection period covered by this report, Tennessee Valley Authority (TVA) performed construction completion as well as preoperational and startup testing activities on safety-related systems and continued engineering design activities of the Watts Bar Nuclear (WBN) Plant, Unit 2 (U2).

I. QUALITY ASSURANCE PROGRAM

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

a. Inspection Scope

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

The inspectors reviewed corrective actions for CR 1129511, The Acceptance Criteria for 2-SI-72-904-A Failed. The inspectors reviewed the corrective actions and observed the retest for 2-CKV-72-524 to verify the test was completed in accordance with Work Order (WO) 115893676 and met the specified acceptance criteria.

The inspectors reviewed corrective actions for CR 1125944, The Acceptance Criteria for 2-SI-72-906-A Failed. The inspectors reviewed the corrective actions and observed the retest for 2-FCV-72-39 to verify the test was completed in accordance with WO 117513303 and met the specified acceptance criteria.

The inspectors also reviewed and followed up on the corrective actions of several CRs discussed throughout various sections of this report.

b. Observations and Findings

No findings were identified.

c. Conclusions

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

II. MANAGEMENT OVERSIGHT AND CONTROLS

C.1 Construction Activities

C.1.1 Unit 1 and Unit 2 Construction and Testing Activity Interface Controls

a. Inspection Scope

The inspectors independently assessed licensee controls, associated with U2 testing activities, to prevent adverse impact on Unit 1 operational safety. The inspectors attended routine Unit 1/Unit 2 interface meetings to assess the exchange and sharing of information between the two site organizations. Periodic planning meetings were observed, at least once per week, to assess the adequacy of the licensee's efforts to identify those testing activities that could potentially impact the operating unit. This included the review of select testing activities, which the licensee had screened as not affecting Unit 1, to verify the adequacy of that screening effort. Additionally, the inspectors independently assessed select testing activities to verify that potential impacts on the operating unit had been identified and adequately characterized with appropriate management strategies planned for implementation. Furthermore, the inspectors performed independent walkdowns of select testing work locations to verify that controls to protect the operating unit provided an adequate level of protection and had been properly implemented.

Specific work activities observed included work associated with:

- WO 117436012, Unit 2 B Train SSPS UV coil volts reading monitoring
- WO 117324944, 2-SI-70-901-A CCS 2A quarterly pump performance test

Specific work activities that the licensee had screened out as not affecting Unit 1 included, but were not limited to, work activities as noted in this inspection report.

b. Observations and Findings

No findings were identified.

c. Conclusions

Overall, management oversight and controls were in place for observed construction and testing activities that could potentially impact the operating unit.

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 licensee'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 licensee personnel.

The 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 licensee's procedures;
- activities in progress (e.g., maintenance, preoperational testing, etc.) were being conducted in accordance with the licensee's procedures;
- watched for abuse of installed instrumentation such as stepping or climbing on the instrumentation that could affect the calibration or ability to function;
- listened for the public address system announcements to determine that blind spots 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.

02.02 (Monthly Inspection Activities): The inspectors reviewed maintenance activities on safety-related equipment (WO 117431376, 2-SI-74-901-A RHR Pump 2A-A Quarterly Performance Test), to verify that the maintenance was scheduled in accordance with developed procedures and that these procedures were adequate for the maintenance being performed. In addition, the inspectors observed the test to verify that the existing in-service testing results had not been invalidated.

02.03 (Quarterly Inspection Activities): No preoperational tests were observed during the inspection period.

b. Observations and Findings

No findings were identified.

c. Conclusion

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

SU.1 Startup Testing Activities

SU.1.1 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The purpose of Inspection Manual Chapter (IMC) 2514, Light Water Reactor Inspection Program – Startup Testing Phase, issue date August 21, 1989, is to verify that the licensee is meeting the requirements and conditions of the facility license for precritical tests, initial fuel loading, initial criticality, low-power testing, and power

ascension tests. This verification is to be achieved through reviewing procedures and records, direct observation, witnessing tests, reviewing test data, and evaluating test results.

Inspection Activities: The inspectors reviewed test procedure 2-PET-102, "Pre-Power Escalation NIS Calibration Data," Revision (Rev.) 0, 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 (TS), and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PET-102 to verify that the procedure contained the following administrative good practice attributes, as appropriate:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- procedure provides for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued is consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provisions were made for the data taker to indicate the acceptability of the data.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438," Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PET-102.

SU.1.2 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The background for this startup test procedure review is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors reviewed test procedure 2-PAT-1.6, "Startup Adjustments of Reactor Control System," Rev. 1, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, TS, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-1.6 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- the procedure provides for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued is consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provisions were made for the data taker to indicate the acceptability of the data.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PAT-1.6, Rev. 1.

SU.1.3 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The background for this startup test procedure review is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors reviewed test procedure 2-PAT- 1.7, "Operational Alignment of Process Temperature Instrumentation," Rev. 1, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, TS, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-1.7 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- procedure provides for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued is consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provisions were made for the data taker to indicate the acceptability of the data.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PAT-1.7, Rev. 1.

SU.1.4 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The background for this startup test procedure review is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors reviewed test procedure 2-PAT-3.3, "RCS Flow Measurement," Rev. 1, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, TS, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-3.3 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- procedure provides for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued is consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provisions were made for the data taker to indicate the acceptability of the data.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PAT-3.3, Rev. 1.

SU.1.5 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The background for this startup test procedure review is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors reviewed test procedure 2-PAT-3.7, "Reactor Coolant Flow Coastdown," Rev. 1, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, TS, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-3.7 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- the procedure provides for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued is consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provisions were made for the data taker to indicate the acceptability of the data.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PAT-3.7, Rev. 1.

SU.1.6 Startup Test Witnessing and Observation (Inspection Procedure 72302)

a. Inspection Scope

Background: The background for this startup test witnessing and observation is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors observed activities associated with the performance of test procedure 2-PAT-3.10, "Reactor Trip System," Rev. 3, to verify that the test was conducted in accordance with approved procedures, to observe operating staff performance, and to ascertain the adequacy of test program records and preliminary evaluation of test results. The inspectors verified the following:

- current revision of appropriate procedure was available and was in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions, to include an independent verification of the reactor trip breaker check sheet, were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment was in service;
- test was performed as required procedure;
- crew actions appeared to be timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- all data was collected for final analysis by proper personnel;
- overall acceptance criteria were met:
    - the reactor trip breakers could be opened manually;
    - interlocks would permit momentary closure of both reactor trip bypass breakers and cause a reactor trip;
    - reactor trip bypass breakers would maintain the rod drive mechanism energized when the associated reactor trip breaker was opened for test; and
    - with one reactor trip bypass breaker closed, placing the opposite trip channel in test would cause both reactor trip breakers and the bypass breaker to open.
- the licensee's preliminary test evaluation was consistent with the inspectors observation; and
- adherence to TS limiting conditions for operation (LCOs) were maintained during testing and included an independent verification that the required reactor trip surveillances were complete to enter into the test.

Additionally, inspectors reviewed the test sequencing document and applicable changes, test director log, control room log, and plant information report during the testing.

b. Observations and Findings

No findings were identified.

c. Conclusion

The inspectors determined that the licensee's power ascension test was performed in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the witnessing of power ascension test procedure 2-PAT-3.10, Rev. 3.

SU.1.7 Startup Test Witnessing and Observation (Inspection Procedure 72302)

a. Inspection Scope

Background: The background for this startup test witnessing and observation is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors observed activities associated with the performance of test procedure 2-PAT-3.1, "Control Rod Drive Mechanism Timing and CERPI Initial Calibration," Rev. 1, to verify that the test was conducted in accordance with approved procedures, to observe operating staff performance, and to ascertain the adequacy of test program records and preliminary evaluation of test results. The inspectors verified the following:

- current revision of appropriate procedure was available and was in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions;
- required test equipment was in service;
- test was performed as required by procedure;
- crew actions appeared to be timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- all data was collected for final analysis by proper personnel;
- during portions of the test observed, overall acceptance criteria were met:
    - the times at which the lift, movable, stationary current orders change, after the start of rod motion, were within 10 msec of the expected times specified;
    - the rod stepping rate was approximately 48 steps/minute for control rods and 64 steps/minute for shutdown rods; and
    - operability of each shutdown and control rod drive mechanism was demonstrated by the ability to withdraw and insert rods.
- the licensee's preliminary test evaluation was consistent with the inspectors observation; and
- adherence to TS LCOs were maintained during testing.

b. Observations and Findings

No findings were identified.

c. Conclusion

The inspectors determined that the licensee's power ascension test was performed in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant

Unit 2 Power Ascension Test Program," Rev. 5. This completes the witnessing of power ascension test procedure 2-PAT-3.1, Rev. 1.

SU.1.8 Startup Test Procedure Review (Inspection Procedure 72300)

a. Inspection Scope

Background: The background for this startup test procedure review is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors reviewed test procedure 2-PET-304, "Operational Alignment of Nuclear Instrumentation," Rev. 0, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, TS, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power escalation test procedure 2-PET-304 to verify that the procedure contained the following administrative good practice attributes:

- the title described the purpose of the procedure;
- the cover page had appropriate information and approval signatures;
- procedure format is consistent with Regulatory Guide 1.68, Appendix C;
- a clear statement of procedure purpose/objectives;
- planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria were clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions were specified;
- the procedure included a section listing references to appropriate FSAR sections, TS, drawings, specification, codes, and other requirements;
- signoff requirements including concurrent and independent verification steps established where appropriate;
- actions to be taken within the steps were specifically identified;
- provisions were made for recording details of the conduct of the test, including observed deficiencies, their resolution, and retest;
- the procedure required that temporary connections, disconnections, or jumpers be restored to normal, or referenced their control by another procedure;
- the procedure provided for identification of personnel conducting the testing and evaluating the test data;
- the procedure as issued was consistent with the test description provided in the FSAR;
- special precautions for personnel and equipment safety were specified;
- detailed instructions specified testing over the full operating range and under the maximum anticipated load change of the system/component;
- provisions were made for the data taker to indicate the acceptability of the data; and
- performance of automatic controls was specified.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's power ascension test procedure was written in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the procedure review of power ascension test procedure 2-PET-304, Rev. 0.

SU.1.9 Startup Test Results Evaluation (Inspection Procedure 72301)

a. Inspection Scope

Background: The background for this startup test results evaluation is the same as that in the background of Section SU.1.1 above.

Inspection Activities: The inspectors performed a detailed review of the results for power ascension test procedures 2-PAT-2.0, "Initial Core Loading Sequence," Rev. 2, 2-PAT-2.1, "Reactor System Sampling For Core Load," Rev. 1, 2-PAT-2.2, "Response Check Of Core Load Instrumentation After 8 Hour Delay In Fuel Movement," Rev. 2, power escalation test procedure 2-PET-105, "Initial Core Loading," Rev. 2, and technical instruction 2-TI-28, "Verification Of Core Load Prior To Vessel Closure," Rev. 1 to verify that the licensee's evaluation of the procedure performance and results was conducted in accordance with approved procedures. This review was performed to provide assurance that the test data was within the established acceptance criteria and the licensee's methods for identifying and correcting deficiencies were adequate. The inspectors performed the following activities associated with this test results review:

- reviewed all changes made to the test procedure to verify they were properly annotated, did not affect the objective of the test, and were performed in accordance with administrative procedures;
- reviewed all documented test deficiencies to verify they had been properly resolved, reviewed, and accepted;
- reviewed the original 'as-run' copy of the test procedure to verify that data sheets were completed and properly initialed and dated (25% sample), data was recorded within acceptance tolerances (25% sample), and test deficiencies that were identified were noted;
- reviewed the test summary and evaluation to verify that the system was evaluated to meet design requirements and acceptance criteria;
- reviewed the approval of the test results for completeness with respect to the acceptance of the test results; and
- independently verified that the fuel assemblies were properly oriented in the reactor core as designed by the review of video footage associated with the completion of 2-TI-28.

The inspectors reviewed the test results to verify that the overall test acceptance was met. The inspectors conducted a review with the responsible test engineer to assure that the test evaluation was performed in accordance with established procedures.

b. Observations and Findings

No findings were identified.

c. Conclusions

The inspectors determined that the licensee's test procedure results were reviewed, evaluated, and accepted in a manner consistent with the guidance of procedure 2-TI-438, "Watts Bar Nuclear plant Unit 2 Power Ascension Test Program," Rev. 5. This completes the test results evaluation of pre-operational test procedures 2-PAT-2.0, 2-PAT-2.1, 2-PAT-2.2, 2-PET-105, and 2-TI-28.

III. OTHER ACTIVITES

OA 1.1 (Discussed) Generic Letter 89-04: Guidance on Developing Acceptable In-Service Testing Programs and Temporary Instruction 2515/114: Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs (Temporary Instruction 2515/114)

a. Inspection Scope

Background: Previous inspection activities and background information regarding Generic Letter (GL) 89-04, Temporary Instruction (TI) 2515/110, and TI 2515/114 were documented in Integrated Inspection Report (IIR) 05000391/2015608, Section OA.1.1 (Agencywide Documents Access and Management System (ADAMS) Accession Number (No.) ML15287A166).

Inspection Activities: The inspectors selected a sample of motor operated valves from the Watts Bar Unit 2 in-service testing (IST) program and reviewed the pre-service test procedures 2-SI-74-902-A, "Quarterly Valve Full Stroke RHR System Train A," Rev. 2, 2-SI-63-903-A, "Valve Full Stroke during Cold Shutdown Safety Injection System Train A," Rev. 2, and 2-SI-72-906-A, "Containment Spray System Valve Position Full Stroke Train A," Rev. 2, to verify the sampled valves were properly implemented into the IST program. The inspectors observed the valve stroke time tests for 2-FCV-74-3, 2-FCV-74-12, 2-FCV-63-8, 2-FCV-63-72, 2-FCV-72-40, and 2-FCV-72-39. The inspectors verified IST valve tests were planned and completed in accordance with the approved IST program and in accordance with the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code 2004 Edition through 2006 Addenda. The inspectors observed the IST valve tests to verify approved procedures were used and the measuring and test equipment was used in compliance with the ASME OM Code 2004 Edition through 2006 Addenda.

The following samples were inspected:

- TI 2515/114 Sections 03.02.b, d, g, h - six samples
- TI 2515/114 Sections 03.03.a, b - six samples

b. Observations and Findings

No findings were identified. The valve stroke time tests were completed and the acceptance criteria was met for four of the six valves. CR 1130629 and CR 1130249 were initiated by TVA to address the two valves, 2-FCV-74-3 and 2-FCV-72-40, that did not meet the required acceptance criteria.

c. Conclusions

The pre-service tests completed for the motor operated valves were completed in accordance with the approved procedures and met the requirements of ASME OM Code 2004 Edition through 2006 Addenda.

OA.1.2 Followup and Inspection of NRC Office of Investigation Report 2-2015-006

a. Inspection Scope

The inspectors reviewed the NRC Office of Investigations (OI) Report 2-2015-006, which was related to material traceability documentation for a safety-related WO.

b. Observations and Findings

On December 10, 2015, the OI completed an investigation to determine whether on June 24, 2014, former Bechtel employees, while working at WBN Unit 2, deliberately violated procedural requirements associated with the material traceability of a threaded rod that was replaced in a safety-related WO.

b.1 Failure to Follow Material Traceability Procedure

Introduction: The inspectors identified a Severity Level (SL) IV non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to follow procedural requirements for material traceability documentation of a safety-related WO.

Description: On November 12, 2014, the inspectors became aware of concerns with WO 115856309, which was in place to address the inability to adjust the cold load setting on a safety-related spring can hanger (System 063, safety injection). The hanger had been improperly adjusted, causing galling to the adjustment nut and causing damage to the threaded rod. The ½" threaded rod was replaced with new material, however, there was no material traceability documentation associated with the replacement threaded rod.

On December 9, 2014, it was requested that Region II OI open an investigation to determine if individuals willfully violated procedural requirements. On December 10, 2015, NRC OI completed their investigation. The NRC substantiated that a former Bechtel craft employee, while working at WBN Unit 2, deliberately violated the material traceability requirements in Watts Bar Unit 2 Construction Completion Project Procedure 25402-000-GPP-0000-N6204, "Field Material Control and Traceability," Rev. 20. Specifically, the craft employee retrieved the replacement threaded rod and brought it to the job location to be installed, knowing that the equipment did not conform to the material traceability requirement.

The licensee initiated CR 912264, which appropriately documented and resolved the hardware concern. A WO was created that removed the non-traceable material and replaced it with the proper traceable material.

The inspectors determined that the failure to follow material traceability procedure requirements was a performance deficiency. This violation was considered as traditional enforcement because it involved willfulness. The inspectors used the NRC Enforcement Policy, Section 6.5, and determined the issue to be of very low safety significance because the licensee failed to establish, maintain, or implement adequate controls over construction processes that are important to safety. However, this finding did not represent a breakdown in a licensee's QA program for construction related to a single work activity. 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.

Watts Bar Unit 2 Construction Completion Project Procedure 25402-000-GPP-0000-N6204, "Field Material Control and Traceability," Rev. 20, established the requirements for maintaining traceability of material and components used for safety-related applications from the time the material is withdrawn from warehouse storage up to the point of final inspection of the installation. Procedure 25402-000-GPP-0000-N6204, step 5.7.1 states that "All ASME material (QA 1), SR material (QA 1 or QA 2), and QR (QA 3) material requires traceability regardless of the intended end use. Material traceability shall be maintained from the warehouse or staging area to the WO. This is accomplished by the FE, Craft Foreman, or Craft entering traceability information for material to be installed on Attachment B, "Material Traceability and Sub-division Record" or Attachment G, "Piping Fabrication and Traceability Record."

Contrary to the above, on June 24, 2014, material traceability was not maintained for a threaded rod installed using WO 115856309, and information for the material was not entered into the WO on Attachment B, "Material Traceability and Sub-division Record". Specifically, a field engineer replaced a threaded rod in a safety-related spring can with a piece of scrap rod with no traceability. The replaced threaded rod was not documented on Attachment B of WO 115856309.

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 a craft employee were willful. In reaching this conclusion, the NRC noted that during transcribed interviews with NRC's OI representatives, the individual involved was trained and knowledgeable of the requirements for material traceability. The involved individual acted deliberately when violating NRC requirements.

In consideration of the fact that the individual was a craft employee with no supervisory responsibilities, and that an engineering evaluation performed by TVA determined that the support would have performed its intended design function with the non-traceable material installed, the NRC concluded that this violation should be characterized at Severity Level IV in accordance with Section 6.5 of the Enforcement Policy.

Furthermore, it was concluded that, despite willfulness, the criteria for a non-cited violation in Section 2.3.2.a.4 of the Enforcement Policy were met. Specifically, (a) the craft employee identified the violation and reported it to the employee concerns program, (b) the violation involved acts by individuals in low-level positions within the licensee's organization, (c) the violation appears to be the isolated action of the employee without management involvement, and the violation was not caused by lack of management oversight, and (d) appropriate corrective actions were taken, which included the replacement of the threaded rod with the appropriate traceable material, and disciplinary action (termination) taken against the foreman who signed off that work was complete, thereby creating a deterrent effect within the licensee's organization.

Therefore, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. This NCV is identified as NCV 05000391/2016601-01, "Failure to Follow Material Traceability Procedure."

b.2 Failure to Maintain Complete and Accurate Material Traceability Information

Introduction: The inspectors identified a SL IV NCV of 10 CFR 50.9(a), "Completeness and Accuracy of Information," for the failure to maintain complete and accurate material traceability information in a safety-related WO.

Description: On November 12, 2014, the inspectors became aware of concerns with WO 115856309, which was in place to address the inability to adjust the cold load setting on a safety-related spring can hanger (System 063, safety injection). The hanger had been improperly adjusted, causing galling to the adjustment nut and causing damage to the threaded rod. The ½" threaded rod was replaced with new material, however, there was no material traceability documentation associated with the replacement threaded rod.

On December 9, 2014, it was requested that Region II OI open an investigation to determine if individuals willfully violated procedural requirements. On December 10, 2015, NRC OI completed their investigation. The NRC substantiated that a former Bechtel craft employee, while working at WBN Unit 2, deliberately violated the material traceability requirements in Watts Bar Unit 2 Construction Completion Project Procedure 25402-000-GPP-0000-N6204, "Field Material Control and Traceability," Rev. 20. Specifically, the craft employee retrieved the replacement threaded rod and brought it to the job location to be installed, knowing that equipment did not conform to the material traceability requirement.

WO 115856309 is a record that the licensee must maintain under 10 CFR 50, Appendix B, Criterion XVII. Attachment B, "Material Traceability and Sub-Division Record" ("Traceability Record") is part of the WO. The instructions included on the record require "QC/FE/Craft or Foreman" to verify the information on the form and "the FE/Foreman/Craft" to "provide verification that material traceability has been maintained." The closure paperwork associated with Attachment B of WO 115856309, did not document that the threaded rod was replaced.

The licensee initiated CR 912264, which appropriately documented and resolved the hardware concern. A WO was created that removed the non-traceable material and replaced it with the proper traceable material.

The inspectors determined that the failure to maintain complete and accurate material traceability information was a performance deficiency. This violation was considered as traditional enforcement because it involved willfulness. The inspectors used the NRC Enforcement Policy, Section 6.5, and determined the issue to be of very low safety significance because the licensee failed to establish, maintain, or implement adequate controls over construction processes that are important to safety. However, this finding did not represent a breakdown in a licensee's QA program for construction related to a single work activity. 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 XVII, "Quality Assurance Records," requires, in part, that licensees maintain sufficient records "to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. The records shall also include closely-related data such as qualifications of personnel, procedures, and equipment." WO 115856309 represents a quality assurance record that the licensee is required to maintain. 10 CFR, section 50.9(a), Completeness and accuracy of information states, "Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects."

Contrary to the above, on June 24, 2014, information associated with material traceability documentation in WO 115856309 was not maintained complete and accurate in all material aspects. Sufficient records were not maintained to furnish evidence of activities affecting quality. Specifically, material traceability information for a threaded rod installed under WO 115856309 was not entered into the WO on Attachment B, "Material Traceability and Sub-division Record," therefore creating a record that was not maintained complete and accurate in all material aspects.

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 a craft employee were willful. In reaching this conclusion, the NRC noted that during transcribed interviews with NRC's OI representatives, the individual involved was trained and knowledgeable of the requirements for material traceability. The involved individual acted deliberately when violating NRC requirements.

In consideration of the fact that the individual was a craft employee with no supervisory responsibilities, and that an engineering evaluation performed by TVA determined that the support would have performed its intended design function with the non-traceable material installed, the NRC concluded that this violation should be characterized at Severity Level IV in accordance with Section 6.5 of the Enforcement Policy.

Furthermore, it was concluded that, despite willfulness, the criteria for a non-cited violation in Section 2.3.2.a.4 of the Enforcement Policy were met. Specifically, (a) the craft employee identified the violation and reported it to the employee concerns program, (b) the violation involved acts by individuals in low-level positions within the licensee's organization, (c) the violation appears to be the isolated action of the employee without management involvement, and the violation was not caused by lack of management oversight, and (d) appropriate corrective actions were taken, which included the replacement of the threaded rod with the appropriate traceable material, and disciplinary action (termination) taken against the foreman who signed off that work was complete, thereby creating a deterrent effect within the licensee's organization.

Therefore, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. This NCV is identified as NCV 05000391/2016601-02, "Failure to Maintain Complete and Accurate Material Traceability Information."

c. Conclusions

The inspectors concluded that CR 912264 appropriately documented and resolved the hardware concern. A WO was created that removed the non-traceable material and replaced it with the proper traceable material. No further inspection is required.

IV. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

An exit meeting was conducted on February, 4, 2016, to present inspection results to Gordon Arent. Further discussion was conducted on February 19, 2016, with Paul Simmons. The inspectors identified that no proprietary information had been received during the inspection and none would be used in the inspection report. The licensee acknowledged the observations and provided no dissenting comments.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

G. Arent, TVA – Licensing Manager
J. O'Dell, TVA - Regulatory Compliance
R. Proffitt, TVA – Licensing
P. Simmons, TVA – Unit 2 Vice President
M. Skaggs, TVA – Senior Vice President

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction and Pre-Construction Activities
IP 71302	Preoperational Test Program Implementation Verification
IP 72300	Startup Test Procedure Review
IP 72301	Startup Test Results Evaluation
IP 72302	Startup Test Witnessing and Observation
TI 2515/114	Inspection Requirements for Generic Letter 89-04, Acceptable In-service Testing Programs

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000391/2016601-01	NCV	Failure to Follow Material Traceability Procedure (Section OA.1.2)
05000391/2016601-02	NCV	Failure to Maintain Complete and Accurate Material Traceability Information (Section OA.1.2)

Discussed

1989-04	GL	Guidance on Developing Acceptable In-Service Testing Programs (Section OA.1.1)
2515/114	TI	Inspection Requirements for Generic Letter 89-04, Acceptable In-Service Testing Programs (Section OA.1.1)

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
CR	Condition Report
FSAR	Final Safety Analysis Report
GL	Generic Letter
IIR	Integrated Inspection Report
IMC	Inspection Manual Chapter (NRC)
IP	Inspection Procedure
IST	In-service Testing
LCO	Limiting Condition for Operation
NCV	Non-Cited Violation
No.	Number
NRC	Nuclear Regulatory Commission
OI	Office of Investigations
OM	Operation and Maintenance
QA	Quality Assurance
QC	Quality Control
Rev.	Revision
SER	Safety Evaluation Report
SL	Severity Level
TI	Temporary Instruction
TS	Technical Specification
TVA	Tennessee Valley Authority
U2	Unit 2
WBN	Watts Bar Nuclear Plant
WO	Work Order
10 CFR	Title 10 to the Code of Federal Regulations