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

June 29, 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 05000391/2016605

Dear Mr. Skaggs:

On May 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 June 17, 2016, with Gordon Arent 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 Severity Level IV violations and were entered into your corrective action program, the NRC is treating the violations as non-cited violations (NCV) 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 addition, if you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at Watts Bar Unit 2 Nuclear Plant.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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 System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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

Sincerely,

/RA/

Daniel W. Rich, Chief
Reactor Projects Branch 8
Division of Reactor Projects

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

Enclosure:
IIR 05000391/2016605
w/Attachment: Supplemental Information

cc w/encl: (See next page)

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Letter to Michael D. Skaggs from Daniel W. Rich dated June 29, 2016.

SUBJECT: WATTS BAR NUCLEAR PLANT UNIT 2 CONSTRUCTION - NRC INTEGRATED INSPECTION REPORT 05000391/2016605

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-391
License No.:	NPF-96
Report No.:	05000391/2016605
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Watts Bar Nuclear Plant, Unit 2
Location:	Spring City, TN 37381
Dates:	May 1, 2016 – May 31, 2016
Inspectors:	E. Patterson, Senior (Acting) Resident Inspector, Reactor Projects Branch (RPB) 8, Division of Reactor Projects (DRP), Region II (RII) J. Eargle, Resident Inspector, RPB8, DRP, RII R. Monk, Senior Project Inspector, RPB 8, DRP, RII
Approved by:	Daniel W. Rich, 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 Title 10 of the Code of Federal Regulations (10 CFR) part 50, Appendix B, Criterion XVI, "Corrective Actions," for inadequate corrective actions of technical specification surveillances completed during preoperational testing. This performance deficiency was determined to be more than minor in accordance with IMC 2517, Appendix C, because the failure to properly identify and correct the problem to comply with licensing commitments, represented an improper work practice that could impact safety, involving safety-related structures, systems, and components. The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.5 of the Enforcement Policy because it represented a failure to meet a regulatory requirement, including one or more QA criteria that had more than minor safety significance; however, it did not represent a breakdown of the licensee's QA program. The licensee issued CR1168120 to address the identified conditions. The inspectors determined that no cross-cutting aspect applied. (Section Q1.1)

- The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow procedures while obtaining chemistry samples of the chemical and volume control system (CVCS) and pressurizer liquid. This performance deficiency was determined to be more than minor, because it represented an improper or uncontrolled work practice that could impact quality or safety, involving safety-related structures, systems, and components. The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.5 of the Enforcement Policy because it represented a failure to meet a regulatory requirement, including one or more QA criteria that had more than minor safety significance; however, it did not represent a breakdown of the licensee's QA program. The violation was entered into the licensee's corrective action program as CR 1173643. The finding was assigned a cross-cutting aspect of Avoid Complacency in the Human Performance area as defined in NRC IMC 0310, because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes [H.12]. (Section SU 1.17)

- Other areas were inspected with no findings identified. These areas included QA; pre-operational testing activities; startup testing activities; and various NRC inspection procedures.

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REPORT DETAILS

Summary of Plant Status

During the inspection period covered by this report, the 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.

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 1079639, initiated as a result of previous NRC inspections, to evaluate completion of Watts Bar Unit 2 tests and surveillances to ensure compliance with Title 10 of the Code of Federal Regulations (10 CFR) part 50.26 subpart I ("the Fatigue Rule"). The inspectors reviewed the corrective actions, to verify that the licensee: (1) adequately identified surveillances completed during hot functional and preoperational testing prior to fuel load; (2) performed a detailed review of all testing activities performed that would be credited towards technical specification operability requirements; (3) evaluated the surveillances that were performed by individuals not covered by the Fatigue Rule work hour limitations; and (4) reperformed technical specification surveillances that did not meet NRC requirements.

b. Observations and Findings:

Introduction: The inspectors identified a Severity Level (SL) IV non-cited violation (NCV) of 10 CFR part 50 (10 CFR 50), Appendix B, Criterion XVI, Corrective Actions," associated with the corrective actions with CR 1079639 to identify and correct issues regarding the licensee's evaluation of the Watts Bar Unit 2 tests and surveillances completed during preoperational testing to ensure compliance with the Fatigue Rule.

Description: The inspection of CR 1079639 revealed that the licensee's intention was to (1) identify surveillances completed during hot functional and preoperational testing prior to fuel load; (2) perform a detailed review of all testing activities performed that would be credited towards technical specification operability requirements; (3) evaluate the surveillances that were performed by individuals not covered by the fatigue rule work hour limitations; and (4) reperform technical specification surveillances that did not meet NRC requirements. The licensee did perform a review of the testing activities performed prior to August 25, 2015 and noted that there were approximately 153 surveillances that were completed that did not meet the requirements of the Fatigue Rule. However, the licensee stated the surveillances were reviewed by a licensed senior reactor operator. The CR was closed in December of 2015.

The inspectors determined that the licensee failed to adequately identify the entire population of surveillances completed during preoperational testing and did not implement the corrective actions to evaluate and or reperform surveillances to comply with the technical specification requirements which included the work hour fatigue rule. Specifically, (1) the licensee did not include all of the groups that completed surveillances during preoperational testing in the licensee's initial evaluation; (2) the licensee took credit for a senior reactor operator completing the technical specification operability review for meeting the requirements of the personnel completing the work to meet the work hour Fatigue Rule; and (3) the licensee did not evaluate or reperform the surveillances that were found to be performed by personnel that did not meet the work hour requirements, as specified by the corrective actions.

The licensee's failure to properly identify and correct the issues was a performance deficiency. This performance deficiency was determined to be more than minor in accordance with Inspection Manual Chapter (IMC) 2517, Appendix C, because the failure to properly identify and correct the problem of not complying with licensing commitments represented an improper work practice that could impact safety, involving safety-related structures, systems, and components. The inspectors determined this finding to be of very low safety significance,SL-IV, in accordance with Section 6.5 of the Enforcement Policy because it represented a failure to meet a regulatory requirement, including one or more quality assurance (QA) criteria that had more than minor safety significance; however, it did not represent a breakdown of the licensee's QA program. 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 XVI, "Corrective Action," requires, in part, that, "conditions adverse to quality are promptly identified and corrected." CR 1079639 directed, in part, to identify surveillance tests performed during preoperational testing, prior to August 25, 2015, and evaluate if the surveillances were performed by individuals not covered by the Fatigue Rule work hour limitations. In addition, the corrective actions included reperforming surveillances that did not meet the requirements.

Contrary to the above, on December 31, 2015 the licensee closed the corrective actions and failed to identify all potential technical specification surveillances performed during preoperational testing and subsequently evaluate or reperform the surveillances that did not meet the Fatigue Rule work hour limitations.

Because this was a SL IV violation and it was entered into the licensee's corrective action program as CR 1168120, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. This violation is identified as NCV 05000391/2016605-01, "Inadequate Corrective Actions for technical specification surveillances completed during preoperational testing."

c. Conclusion

The inspectors identified an NCV associated with the inspection of the corrective actions associated with technical specification surveillances performed during preoperational testing the did not meet the work hour Fatigue Rule requirements. The licensee generated CR 1168120 to address the finding.

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 Unit 2 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.

b. Observations and Findings

No findings were identified.

c. Conclusions

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

P.1 Preoperational Activities

P.1.1 Preoperational Test Results Review (Inspection Procedure 70325)

a. Inspection Scope

Background: The purpose of the inspections of preoperational test activities 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.

The following inspection was performed in relation to satisfying the required preoperational test results review required by IMC 2513.

Inspection Activities: The inspectors performed a detailed review of the results for preoperational test instruction (PTI), 2-PTI-099-01, "RPS & ESFAS Response Times", and 2-PTI-099-06, "Reactor Protection Setpoint Verifications." The inspection scope included interviews with knowledgeable startup engineers as well as document reviews of preoperational test records. The test completion packages were checked to verify accurate translation of test data into PTI data sheets; conformance of results to acceptance criteria; completeness, legibility, and organization of records; and proper documentation of reviews and approvals. The inspectors verified whether the licensee's evaluations of the procedure performance and results were conducted in accordance with approved procedures. The review also evaluated whether 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 test summary and evaluation to verify that the system was evaluated to meet design requirements and acceptance criteria;
- Reviewed the original "as-run" copy of the test to verify completion of data sheets and calculations; and
- Verified the approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

The following system functions and setpoints were evaluated as inspection samples:

Response Times

- Overpower Differential Temperature
- Reactor Coolant Flow Low
- Steam Generator Level Low-Low
- Containment Pressure High – Safety Injection
- Pressurizer Pressure Low – Feedwater Isolation
- Steam Line Pressure Low – Emergency Diesel Start

Setpoint Verifications

- Intermediate Range High Neutron Flux Trip
- Overtemperature/Overpower Delta T Trip
- Pressurizer High Water Level Trip
- Low Reactor Coolant Flow Trip
- Low Steamline Pressure Safety Injection
- Containment High Pressure Safety Injection
- Containment Sump Level High – Refueling Water Storage Tank Swapover
- Auxiliary Feedwater Pump Actuation on Main Feed Pump Turbine Trip
- Steam Generator Level High - Turbine Trip and Feedwater Isolation

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 SMP-10.0, "Watts Bar Nuclear Plant Unit 2 Packaging and Processing Test Results," Revision (Rev.) 6. This completes the test results review of preoperational test procedures 2-PTI-099-01 and 2-PTI-099-06.

SU.1 Startup Testing Activities

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

a. Inspection Scope

Background: The purpose of 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-PAT-1.3, "Large Load Reduction Test" 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 (RG) 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-1.3 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;
- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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; and
- provision is 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-1.3, Rev. 1.

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 2-PAT-1.9, "Automatic Steam Generator Level Control," Rev. 2, to verify that the power ascension test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, Technical Specifications, and Regulatory Guide 1.68. Additionally, the inspectors reviewed 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;
- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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; and
- provision is 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 2-PAT-1.9, Rev. 2.

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 2-PAT-7.1, "Calibration of Steam and Feedwater Flow Instruments at 75% Power," Rev. 1, to verify that the power ascension test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, Technical Specifications, and Regulatory Guide 1.68. Additionally, the inspectors reviewed 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;
- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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;
- 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 are specified;
- detailed instructions specify testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provision is 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 2-PAT-7.1, 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, 2-PAT-8.4, "Calibration of Steam and Feedwater Flow Instruments at 100% Power," Rev. 1, to verify that the power ascension 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 2-PAT-8.4 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;
- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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;
- 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 are specified;
- detailed instructions specify testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provision is 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 2-PAT-8.4, Rev.1.

SU 1.5 Startup Test Procedure Review (Inspection Procedures 72300 and 72583)

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-8.5, "Shutdown from Outside the Main Control Room," Rev. 1 to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, Technical Specifications, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-8.5 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;
- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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;
- 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 are specified;

- detailed instructions specify testing over the full operating range and under the maximum anticipated load change of the system/component; and
- provision is made for the data taker to indicate the acceptability of the data.

Specific requirements of IP 72583 were also verified, including:

- the following precautions:
  - crew assignments made for necessary manual actions, if required;
  - control room operations were permitted that were required to protect equipment; and
  - assurance that control room manning was maintained per technical specifications.
- initial conditions requiring steady state power operation greater than 10%; and
- confirmation that the test required the following:
  - trip if the reactor from outside the control room;
  - data records during the transient and stable conditions;
  - acceptance criteria were met; and
  - restoration of the plant to normal conditions using the proper plant procedures.

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-8.5, Rev. 1.

SU.1.6 Startup Test Procedure Review (Inspection Procedure 72300 and 72580)

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-8.6, "Plant Trip From 100% Power," Rev. 2, to verify that the test procedure adequately addressed NRC requirements and licensing commitments outlined in the FSAR, docketed correspondence, SER, Technical Specifications, and Regulatory Guide 1.68. Additionally, the inspectors reviewed power ascension test procedure 2-PAT-8.6 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;

- contains planning information such as prerequisites, precautions, required tools, reference documents, and coordination requirements;
- acceptance criteria are clearly identified and evaluated against the source of the comparison of results with acceptance criteria;
- adequate initial test conditions are specified;
- the procedure includes 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 are specifically identified;
- provision is 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;
- 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 are specified;
- detailed instructions specify testing over the full operating range and under the maximum anticipated load change of the system/component; and
  provision is made for the data taker to indicate the acceptability of the data.

Specific requirements of IP 72580 were also verified, including:

- testing commitments were included;
- appropriate acceptance criteria was verified;
- appropriate precautions and crew assignments were made to maintain safe plant conditions;
- appropriate initial conditions are met; and
- appropriate test conditions were verified.

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 and implemented all aspects of the FSAR Chapter 14 requirements for a plant trip from 100% Power. This completes the procedure review of power ascension test procedure 2-PAT-8.6, Rev. 2.

SU 1.7 Startup Test Witnessing and Observation (Inspection Procedures 72302)

a. Inspection Scope

Background: The background for this startup test 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- 3.2, "Pressurizer Spray Capability and Continuous Spray Flow Setting," Rev. 4, to verify that the test was conducted in accordance with approved procedure, 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting conditions for operation (LCOs) was maintained during testing.

Additionally, inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily. The inspectors observed "offshift" personnel during "just in time" training to verify that the operations staff was integrated into the organization to obtain experience and training during the conduct of power ascension tests. The inspectors also observed the Test Data Evaluation Group's review of 2-PAT-3.2.

b. Observations and Findings

No findings were identified.

c. Conclusions

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-3.2, Rev. 4.

SU 1.8 Startup Test Witnessing and Observation (Inspection Procedures 72302)

a. Inspection Scope

Background: The background for this startup test 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- 3.4, Rod Control and Rod Position Indication (CERPI) Rev. 3, to verify that the test was conducted in accordance with approved procedure, 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting LCOs was maintained during testing.

Additionally, the inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily.

b. Observations and Findings

No findings were identified.

c. Conclusions

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-3.4, Rev. 3.

SU 1.9 Startup Test Witnessing and Observation (Inspection Procedures 72302)

a. Inspection Scope

Background: The background for this startup test 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-3.8, "Rod Drop Time Measurement and Stationary Gripper Release Timing," Rev. 3, to verify that the test was conducted in accordance with approved procedure, 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting LCOs was maintained during testing.

Additionally, the inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily.

b. Observations and Findings

No findings were identified.

c. Conclusions

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-3.8, Rev. 3.

SU 1.10 Startup Test Witnessing and Observation (Inspection Procedures 72302)

a. Inspection Scope

Background: The background for this startup test 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-5.1, "Dynamic Automatic Steam Dump Control," to verify that the test was conducted in accordance with approved procedure, 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;

- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting LCOs was maintained during testing.

Additionally, the inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily.

b. Observations and Findings

No findings were identified.

c. Conclusions

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-5.1.

SU 1.11 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 procedure 2-PAT-3.2, "Pressurizer Spray Capability and Continuous Spray Flow Setting," 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, data was recorded within acceptance tolerances, 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, specificically:
    - The pressurizer pressue response to the opening of both normal spray valves was within the allowage range specified by the Westinghouse performance curves; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 test procedure 2-PAT-3.2.

SU 1.12 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 procedure 2-PAT-3.4, "Rod Control and Rod Position Indication," 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, data was recorded within acceptance tolerances, 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, specifically:
    - The initial hot calibration of CERPI was completed and the linearaity was within the step requirements

  - The calibration of the CERPI channels and full range verification was competed
  - The control bank alarm annunciators intiated at the appropriate steps and rod deviations
  - Each rod position and rod motion indications were consistent with the group demand indication for the full range of rod travel
  - The rod speed display functions properly indicated the rod stepping rate
  - The rod direction indicator lights function properly to indicate the rod movement status
  - The rod group counters functioned properly to indicate group position and direction of rod motion during withdrawal and insertion
  - The CERPI system function properly to indicate individual rod position and direction of motion during rod withdrawal and insertion
  - The rod insertion limits were set properly
  - The control rod bank overlap circuitry functions properly during withdrawal and insertion; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 test procedure 2-PAT-3.4.

SU 1.13 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 procedure 2-PAT-3.8, "Rod Drop Time Measurement and Stationary Gripper Release Timing," 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 licesnee'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, data was recorded within acceptance tolerances, 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, specifically:
    - Each control rod drive mechanism unlatched upon opening the reactor trip breakers
    - The rod drop times for all shutdown and control rods, dropped from the fully withdrawn position, are within the limits specified in the technical specifications; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 procedure 2-PAT-3.8.

SU 1.14 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 procedure 2-PAT-3.11, "Adjustment of Steam Flow Transmitters at Minimal Flow," to verify that the licesnee'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, data was recorded within acceptance tolerances, 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, specifically:
    - Each control rod drive mechanism unlatched upon opening the reactor trip breakers;
    - The reactor coolant flow determined by calorimetric measurement; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 procedure 2-PAT-3.11.

SU 1.15 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 procedure 2-PAT-3.7, "Reactor Coolant Flow Coastdown," 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, data was recorded within acceptance tolerances, 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; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 procedure 2-PAT-3.7.

SU 1.16 Precritical Data Review (Inspection Procedures 72301 and 72596)

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 performed a detailed review of the results for power ascension test procedure 2-PAT-3.0, "Post Core Loading Precritical Test Sequence," which included the documentation of completed tests required prior to initial criticality. In addition 2-PAT-3.0 included the corrective actions from the Hot Functional Test deferrement, CR 1075347, associated with 2-PTI-62-03, which required a retest of the chemical and volume control system (CVCS) flow control valve, 2-FCV-92-93, and the system's ability to provide seal water flow to the reactor coolant pump seals within the acceptable limits. The data review was completed by the inspectors to verify that the licensee's evaluation of the procedure performance and results was conducted in accordance with approved procedures and that the licensee evaluated the test results required to be completed prior to initial criticality. 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 data was recorded within acceptance tolerances and test deficiencies that were identified were noted;
- Reviewed the test summary and evaluation to verify that the system was evaluated to meet the acceptance criteria and verify the licensee had evaluated the test results of the following, that are applicable for initial criticality:

  (1) 2-PAT-3.10, "Reactor Protective Trip System;"
  (2) 2-PAT-3.1, "Rod Drop Time Measurements;"
  (3) Reactor Coolant Leak Test, reactor coolant system (RCS) leakage continues to be monitored, and the plant is in compliance with the technical specification;
  (4) 2-SI-92-131 and 132, "Calibration and Neutron Response Check of SRMs;"
  (5) 2-PAT-3.2, "Pressurizer Effectiveness;"
  (6) 2-PET-106, 2-PAT-3.1 and 2-PAT-3.8, Mechanical and Instrumentation Tests on Control Rod Drives and Position Indication;
  (7) Mechanical and Electrical Tests of Incore Monitors, Not applicable for initial criticality, fixed incore instrumentation testing is planned for the 30% power plateau;
  (8) 2-PAT-3.3, and 2-PAT-3.7, "Flow Coastdown, Hot Flow and Flow Characteristics;" and
  (9) 2-PAT-1.4, "Pipe Vibration Monitoring."; and
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results.

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 procedure 2-PAT-3.0.

SU 1.17 PWR Initial Criticality Witnessing (Inspection Procedures 72302 and 72592)

a. Inspection Scope

Background: The background for this startup test 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-PET-201, "Initial Criticality And Low Power Physics Testing," 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting LCOs was maintained during testing.

Additionally, the inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily. Prior to the start of control rod withdrawal, the inspectors performed the following:

- identified all technical specifications and license conditions requirements applicable during the initial approach to critical;
- verified that the licensee was meeting license commitments (for 30% of the applicable technical specifications);
- verified that startup and intermediate nuclear instruments had been properly calibrated and were operating with required count rate and signal-to-noise ratio; and
- confirmed that trip checks had been performed on nuclear instruments, and that instruments trip in noncoincidence (if required by technical specifications and license conditions).

The inspectors performed the following to verify the licensee's conformance to administrative and procedure requirements:

- during three separate periods in the test, verified that crew requirements were being met as defined in the procedures, and that staffing satisfied requirements of technical specifications and license conditions regarding licensed operators;
- verified that the proper version of the procedure was in use and that it was being followed;
- confirmed that all referenced procedures had been reviewed and approved;
- verified that 10% of the prerequisites had been satisfied;
- reviewed special instrumentation required by the procedure, its use, and the analysis of data. Reviewed inverse multiplication plots; and

- evaluated adequacy of onsite technical support, by licensee and contractor.

The inspectors reviewed the “as-run” procedure and performed the following:

- reviewed all changes or revisions to the test procedure and verified they were properly reviewed and approved;
- reviewed test deficiencies, their resolution, and retest and verified they were reviewed by appropriate management; and
- reviewed data sheet entries for legibility, traceability, and permanence.

The inspectors evaluated the test results and performed the following:

- using the licensee's procedure, independently predicted the critical boron concentration with the startup rod pattern;
- during dilution, reviewed the licensee's calculations for conformance to predictions;
- during dilution, independently verified the rod pattern, and observed one coolant system boron analysis;
- verified the actual critical value was within 1000 pcm of the predicted value, as confirmed by consultation with the reactor engineer;
- observed and confirmed source to intermediate range nuclear instrumentation overlap testing; and
- reviewed the licensee's test results evaluation, including contribution from nuclear steam supply system technical support.

Additionally, the inspectors reviewed the control room log for the period from 48 hours before test initiation to test completion.

b. Observations and Findings

Introduction: The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to follow procedures while obtaining chemistry samples of the CVCS and pressurizer liquid.

Description: During the Watts Bar Nuclear Plant Unit 2 startup, the chemistry department was procedurally driven to obtain representative RCS samples at various times during the evolution. One aspect of this is to ensure that RCS boron concentrations are consistent with the operations requirements and that there is not an inappropriate boron concentration imbalance between the pressurizer and the RCS. To collect these samples, the licensee used procedure 2-CM-6.24, “Sampling CVCS Mixed Bed Demineralizers,” Rev. 1, and procedure 2-CM-6.21, “Sampling The Pressurizer Liquid,” Rev. 3.

On May 22, 2016, the inspectors observed the chemistry technician collect samples of the CVCS and pressurizer to be analyzed. After allowing the technician to complete the procedures, the inspector questioned the technician as to why the technician did not perform all of the steps in the procedures. Specifically, the technician did not perform section 6.3.3, step 1 of procedure 2-CM-6.24, which directed the adjustment of a pressure regulating valve to attain a sample flow of 8-14 gph, and did not perform section 6.3, step 1 of procedure 2-CM-6.21, which directed the adjustment of a pressure

regulating vale to a sample flow of 8-10 gph. The inspector noted that on the completed procedures, the technician had circled and slashed the steps to indicate that they had been performed. Additionally, the inspector noted that the while the technician did not ensure that there were adequate sample flow rates, the flow rate for the pressurizer sample indicated 8 gph, which was acceptable, but the CVCS sample flow rate indicated 3 gph which was below the values required to proceed with the sample collection. Upon confirmation that the procedures were not properly performed, the technician discarded the previously collected samples and collected and analyzed new samples in accordance with procedures. The issue was captured in the licensee's corrective action program as CR 1173643. Additionally, the licensee informed the inspector that the sample flow rates had been verified to be appropriate earlier in the shift. Through discussions with the licensee, the inspector noted the technician failed to consider how changing plant conditions may have led to the sample flow rates changing, but proper procedure use and adherence could have prevented the error.

The licensee's failure to follow procedures while obtaining chemistry samples of the CVCS and pressurizer liquid was determined to be a performance deficiency. The performance deficiency was more than minor, because it represented an improper or uncontrolled work practice that could impact quality or safety, involving safety-related structures, systems, and components. Specifically, not following the procedures for proper sampling of the CVCS and pressurizer could lead to a non-representative sample being used by plant operations. The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.5 of the NRC Enforcement Policy because it represented a failure to meet a regulatory requirement, including one or more QA criteria that had more than minor safety significance; however, it did not represent a breakdown of the licensee's QA program. The finding was assigned a cross-cutting aspect of Avoid Complacency in the Human Performance area as defined in NRC IMC 0310, because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes [H.12].

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, And Drawings," required, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, on May 22, 2016, the licensee failed to accomplish activities affecting quality in accordance with procedures. Specifically, the licensee failed to perform section 6.3.3, step 1 of procedure 2-CM-6.24, and failed to perform section 6.3, step 1 of procedure 2-CM-6.21. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's corrective action program as CR 1173643 and the licensee collected and analyzed additional CVCS and pressurizer samples. (NCV 05000391/2016605-02, "Failure to Follow Procedures For Collecting Chemistry Samples.")

c. Conclusions

With the exception of the inspection finding described above, the inspectors determined that the licensee's power escalation 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 escalation test procedure 2-PET-201.

SU 1.18 Startup Test Witnessing and Observation (Inspection Procedure 72302)

a. Inspection Scope

Background: The background for this startup test 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 surveillance instructions 2-SI-0-12, "Core Reactivity," Rev. 4, and 2-SI-0-23, "Moderator Temperature Coefficient (MTC) Determination At Beginning of Life (BOL)," Rev. 2 to verify that the tests were 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 in use by the operating staff;
- minimum crew requirements were met;
- test prerequisites and initial conditions were met and those that were waived were reviewed/approved in accordance with procedure and TS requirements;
- required test equipment or data collection equipment was calibrated and in service;
- test was performed as required by procedure;
- crew actions were timely during the performance of the test and coordination was adequate;
- summary analysis was performed to assure proper plant response to the test;
- data was collected for final analysis by proper personnel;
- overall acceptance criteria had been met;
- the preliminary test evaluation was consistent with the inspector's observation; and
- adherence to TS limiting LCOs was maintained during testing.

Additionally, the inspectors reviewed the test sequencing document and applicable changes, test directors log, control room log, and plant information report daily.

b. Observations and Findings

No findings were identified. TVA procedure 2-SI-0-25, "Negative MTC Maintenance Calculation," Rev. 0 was part of the NRC's scope of inspection, if performed by TVA. However, 2-SI-0-25 was not performed by TVA due to the moderator temperature coefficient being negative at the beginning of core life.

c. Conclusions

The inspectors determined that the surveillance instructions were 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 surveillance instructions 2-SI-0-12 and 2-SI-0-23.

SU 1.19 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 procedure 2-PAT-4.0, "Initial Criticality And Low Power Test Sequence," Rev. 2, power escalation test procedure 2-PET-201, "Initial Criticality And Low Power Physics Testing," Rev. 1, and surveillance instructions 2-SI-0-12, "Core Reactivity," Rev. 4, and 2-SI-0-23, "Moderator Temperature Coefficient Determination At BOL," Rev. 2, 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. [02.01]
- Reviewed all documented test deficiencies to verify they had been properly resolved, reviewed, and accepted. [02.02]
- 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. [02.03]
- Reviewed the test summary and evaluation to verify that the system was evaluated to meet design requirements and acceptance criteria. [02.04]
- The approval of the test results was reviewed for completeness with respect to the acceptance of the test results. [02.05]

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 test procedures 2-PAT-4.0, 2-PET-201, 2-SI-0-12, and 2-SI-0-23.

III. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

An exit meeting was conducted on June 17, 2016, to present inspection results to Gordon Arent. 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

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

INSPECTION PROCEDURES USED

IP 35007	Quality Assurance Program Implementation During Construction and Pre-Construction Activities
IP 70325	Preoperational Test Results Evaluation - Reactor Protection System
IP 72300	Startup Test Procedure Review
IP 72583	Power Ascension Test Procedure Review: Shutdown from Outside the Control Room
IP 72592	PWR Initial Criticality Witnessing
IP 72596	Precritical Data Review
IP 72580	Power Ascension Test Procedure Review Turbine Trip or Generator Trip
IP 72301	Startup Test Procedure Review
IP 72302	Startup Test Witnessing and Observation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

70325	IP	Reactor Protection System Test Results Evaluation (Section P.1.1)

Opened and Closed

05000391/2016605-01	NCV	Inadequate Corrective Actions for technical specification surveillances completed during preoperational testing (Section Q.1.1)
05000391/2016605-02	NCV	Failure to Follow Procedures For Collecting Chemistry Samples (Section SU 1.17)

LIST OF DOCUMENTS REVIEWED

P.1 PREOPERATIONAL ACTIVITIES

P.1.1 Preoperational Test Results Review (Inspection Procedures 70325)

2-PTI-099-01, Rev. 0, RPS & ESFAS Response Times
2-PTI-099-06, Rev. 0, Reactor Protection Setpoint Verification
2-SI-30-43, Rev. 03, 18 Month Channel Calibration Containment Pressure Channel III Loop 2-LPP-30-43 (P935), dated 11/23/2015
WO 115881746, 2-SI-68-1, 18 Month Channel Calibration RCS Loop 1 Delta T/T_{AVG} Channel I Loop 2-LPT-68-2 (T-411/412)
WO 115885513, 2-SI-68-14, 18 Month Channel Calibration Reactor Coolant Flow Loop 1 Channel III Loop 2-LPF-68-6D (F-416)
WO 115866533, 2-SI-1-2, 18 Month Channel Calibration Steam Generator 1 Main Steam Header Pressure, Channel II Loop 2-LPP-1-2B (P-515)
WO 115875510, 2-SI-30-43, 18 Month Channel Calibration Containment Pressure Channel III Loop 2-LPP-30-43 (P-935)
WO 115878439, 2-SI-63-2, 18 Month Channel Calibration Containment Sump Level Channel II Loop 2-LPL-63-181 (L-921)
WO 115872467, 2-SI-3-25, 18 Month Channel Calibration TADOT and Response Time Test Auxiliary Feedwater Initiation from Main Feedwater Pump Turbine 2A Trip
WO 115872497, 2-SI-3-3, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 2-LPL-3-42 (L-517)
WO 115938628, 2-SI-99-221, RTD Response Time Test RCS Loop 3 Channel III Loop 2-LPT-68-44 (T-431/432)
WO 117060130, 2-SI-99-207, Response Time Test of Solid State Protection System Input Relays Cycle B
WO 117060170, 2-SI-99-225, Response Time Test of Reactor Protection and Engineered Safeguards Function Actuation System Transmitters (SG-1M Method) For Cycle C
TDN 16-0058 (2-PTI-099-06), Test Results not documented in specified surveillance instruction
TDN 16-0064 (2-PTI-099-01), RCS narrow range RTDs did not meet acceptance criteria of less than or equal to 6.5 seconds
Change Notice (CN) 01 to 2-PTI-99-06, INTENT change to correct setpoint and tolerance errors
Change Notice (CN) 02 to 2-PTI-99-06, INTENT change to align acceptance criteria shown in Data Sheet 13 to conform to several NSSDs
Change Notice (CN) 04 to 2-PTI-99-06, INTENT change to adjust the Power Range High Neutron Flux Trip to conform to an interim requirement in the Nuclear Operations Book to trip at 24% RTP on initial startup
CR 1172631 (NRC Identified) Discrepancy with As-Left Tolerance Specified for 2-PS-46-13

SU.1 STARTUP TESTING ACTIVITIES

SU 1.17 PWR Initial Criticality Witnessing (Inspection Procedures 72302 and 72592)

Work Orders:
WO 115874787, 2-SI-3-923-B, Motor Driven Auxiliary Feedwater Pump 2B-B Comprehensive Performance Test
WO 115947945, 2-SI-63-10.2-A, ECCS Pumps And Discharge Pipes Venting - Train A Outside Containment
WO 115948792, 2-SI-63-903-B, Valve Full Stroke Exercising During Cold Shutdown Safety INJ (Train B)
WO 117435045, 2-SI-67-907-B, Valve Full Stroke Exercising During Plant Operation - ERCW (Train 2B)

WO 117435562, 2-SI-70-905-A, Valve Full Stroke Exercising During Cold Shutdown Component Cooling Water (TR A)
WO 115877142, 2-SI-61-902-A, “Ice Condenser Valve Position Indication Verification (Train A),” Revision 2
WO 115937271, 2-SI-3-906-A, “Check Valve Testing During Hot Standby – Auxiliary Feedwater System (Train A), Revision 1
WO 115948585, 2-SI-63-10-B, “ECCS Pumps Venting – Train B,” Revision 1
WO 117359138, WO: 117170615, WO: 117367500, 2-SI-32-901-A, “Valve Full Stroke Exercising During Cold Shutdown Control Air (Train),” Revision 5
WO 115877142, 2-SI-61-902-A, “Ice Condenser Valve Position Indication Verification (Train A),” Revision 2
WO 115937271, 2-SI-3-906-A, “Check Valve Testing During Hot Standby – Auxiliary Feedwater System (Train A), Revision 1
WO 115948585, 2-SI-63-10-B, “ECCS Pumps Venting – Train B,” Revision 1
WO 117359138, WO: 117170615, WO: 117367500, 2-SI-32-901-A, “Valve Full Stroke Exercising During Cold Shutdown Control Air (Train),” Revision 5
WO 115874787, 2-SI-3-923-B, Motor Driven Auxiliary Feedwater Pump 2B-B Comprehensive Performance Test
WO 115948792, 2-SI-63-903-B, Valve Full Stroke Exercising During Cold Shutdown Safety INJ (Train B)
WO 117435045, 2-SI-67-907-B, Valve Full Stroke Exercising During Plant Operation - ERCW (Train 2B)
WO 117435562, 2-SI-70-905-A, Valve Full Stroke Exercising During Cold Shutdown Component Cooling Water (TR A)
WO 115947945, 2-SI-63-10.2-A, ECCS Pumps And Discharge Pipes Venting - Train A Outside Containment
WO 117610851, 2-SI-99-613-B, Response Time Test - Containment Isolation Phase A SLAVE Relay K613 - Train B
WO 117508916, 2-SI-3-901-B, Motor Driven Auxiliary Feedwater Pump 2B-B Quarterly Performance Test
WO 115228139, 2-SI-68-81, Offline Channel Calibration of RVLIS Transmitters and RCS Wide Range Pressure Transmitters Trains A & B, Rev. 2
WO 115858595, 2-SI-1-104, 184 Day COT SG 2 Main Steam Header Pressure Channel I LOOP 2-LPP-1-9A
WO 115866582, 2-SI-1-4, “18 Month Channel Calibration SG 2 Main Steam Header Pressure Channel I Loop 2-LPP-1-9A (P524),” Revision 2
WO 115873109, 2-SI-3-407, 18 Month Channel Calibration North Valve Vault Level Switch Channel IV, Rev. 2
WO 115877976, SI-62-909, “Emergency Boration Check Valve Test,” Revision 1
WO 115881035, 2-SI-65-9-B, 18 Month Emergency Gas Treatment System Pressure Test - Train B (UNIT 2)
WO 115881752, 2-SI-68-10, “18 Month Channel Calibration Pressurizer Level Channel II LOOP 2-LPL-68-335 (L-460),” Revision 3
WO 115886604, 2-SI-26-903, “Valve Full Stroke Exercising and PIV During Plant Operation HPFP System,”
WO 115890416, 2-SI-68-73, 18 Month Channel Calibration RCS Loop 2 Wide Range Cold Leg, Rev 2
WO 115892625, 2-SI-62-915-B, Boric Acid Transfer Pump 2B-B Comprehensive Performance Test
WO 115893835, 2-SI-74-62-A, 18 Month CH CAL Remote Shutdown RHR Pump 2A-A Miniflow 2-FS-74-12A, B and 2-FI-74-12

WO 115893910, 2-SI-74-64, 18 Month CH CAL Remote Shutdown Control RHR HX A/B Bypass Flow LOOP 2-LPF-74-32
WO 115894011, 2-SI-77-1, "18 Month CH CAL RX Building Aux Floor and Equip Drain Pocket Sump Level Loop 2- LPL-77-410," Revision 2
WO 115898005, 2-SI-92-31, 18 Month Channel Calibration Source Range, Intermediate Range and Remote Shutdown Neutron flux Channel I
WO 115898025, 2-SI-92-32, 18 Month Channel Calibration of Source Range and Intermediate Range Channel II
WO 115898162, 2-SI-92-41, 18 Month Channel Calibration of Power Range Nuclear Instrumentation System Channel N-41
WO 115898208, 2-SI-92-42, 18 Month Channel Calibration of Power Range Nuclear Instrumentation System Channel N-42
WO 115898252, 2-SI-92-43, 18 Month Channel Calibration of Power Range Nuclear Instrumentation System Channel N-43
WO 115899312, 2-SI-99-227, Response Time Test of RWST and Containment Sump XMTRs (SG-1M Method) for Cycle B
WO 115899187, 2-SI-92-44, 18 Month Channel Calibration of Power Range Nuclear Instrumentation System Channel N-44
WO 115899702, 2-SI-99-32, Source Range High Neutron Flux Level Trip Response Channel II, Revision 3 and 2-TI-432.02, Instruction Validation, Revision 0
WO 115938107, 2-SI-68-33, "Measurement Of Reactor Coolant Pump Seal Injection Flow," Rev. 1
WO 115947809, 2-SI-3-924, Post Outage Auxiliary Feedwater System Flow Verification, Rev. 1
WO 115948821, 2-SI-63-911, Backseating 2-CKV-63-502 and Full Stroke Exercising 2-FCV-63-1 During Cold Shutdown
WO 117325006, 2-SI-70-901-B, Component Cooling System Pump 2B-B Quarterly Performance Test, Rev 6
WO 117432465, 2-SI-68-192, 31 Day Channel Operational Test of PORV 2-PCV-68-340A COMS Actuation Channel
WO 117501640, 2-SI-62-905, Valve Full Stroke Exercising During Cold Shutdown - CVCS System
WO 117508916, 2-SI-63-901-B, Safety Injection Pump 2B-B Quarterly Performance Test
WO 117508916, 2-SI-63-901-B, Safety Injection Pump 2B-B Quarterly Performance Test
WO 117508876, 2-SI-72-2, "Containment Spray Flow Path Valves: Position Verification," Revision 1
WO 117532735, 2-SI-72-901-B, Containment Spray Pump 2B-B Quarterly Performance Test
WO 117535304, 2-SI-74-901-A, "Residual Heat Removal Pump 2A-A Quarterly Performance Test," Revision 3
WO 117536345, 2-SI-99-10-B, 62 Day Functional Test of SSPS Train B and Reactor Trip Breaker B
WO 117547514, 2-SI-90-19, 92 Day COT Containment Bldg Upper Compt Particulate RAD MON LOOP 2-LPR-90-112A
WO 117549180, 2-SI-92-144, 184 Day COT of Power Range Nuclear Instrumentation System Channel N-44
WO 117549340, 2-SI-68-35, Pressurizer Heater Capacity
WO 117549245, 2-SI-92-141, 184 Day COT of Power Range Nuclear Instrumentation System Channel N-41
WO 117549271, 2-SI-68-46, 92 Day RCP 1 UV/UF Trip Actuating Device Operational Test
WO 117549349, 2-SI-92-143, 184 Day COT of Power Range Nuclear Instrumentation System Channel N-43
WO 117549373, 2-SI-92-142, 184 Day COT of Power Range Nuclear Instrumentation System Channel N-42
WO 117580490, 2-SI-62-915-B, Boric Acid Transfer Pump 2B-B Comprehensive Performance Test

WO 117619704, 2-SI-62-914-A, Boric Acid Transfer Pump 2A-A Comprehensive Pump Test
WO 117678622, 2-SI-3-920 Valve Positions Indication Verification AFW System Turbine Driven AFW Traom
WO 117716731, 2-SI-92-131, 31 Day COT of Source and Intermediate Range Neutron Flux CH I
WO 117734882, 2-SI-92-132, 31 Day COT of Source and Intermediate Range Neutron Flux CH II
WO 112857594 and WO: 115872126, 2-SI-3-17, "18 Month Channel Calibration of Steam Generator 2 Turbine Driven AFW Level Control Loop 2-LPL-3-173," Rev. 1

Condition Reports:
CR 1105427, 2-PIC-32-111 Has Wrong Rang Gauge Installed
CR 1105430, 2-PIC-32-81 Has Wrong Range Guage Installed
CR 1105437, 2-SI-32-901-A Acc Criteria Cannot Be Met Due To Suspected 2-FCV-32-111 Leakby
CR 1106604, Potential Rework
CR 1173643, Procedure Use And Adherence Error During U2 CVCS/PZR Sampling
CR 1173995, Review Criteria Exceeded For Unit 2 Cycle 1 Boron Endpoint
CR 1174136, Unit 2 Source Range Difference Impact on 2-TI-7.032
CR 1174139, Unit 2 Initial Intermediate Range Indications And 2-SI-92-2
CR 1174140, Unit 2 ICS "ICRR" Screen Error
CR 1179178, Missing Initials And N/As On The Pre-Job Brief Checklist For 2-PAT-4.0
CR 1179267, U2 NRC Inspector Identified Missing Information In 2-PET-201 PJB

Procedures:
2-CM-5.08, Start Up Primary Chemistry Control, Rev. 1
2-CM-6.21, Sampling The Pressurizer Liquid, Rev. 3
2-CM-6.24, Sampling CVCS Mixed Bed Demineralizers, Rev. 1
2-CM-6.24, Sampling CVCS Mixed bed Demineralizers, Rev. 1
2-GO-2, Reactor Startup, Rev. 3
2-PAT-4.0, Initial Criticality and Low Power Test Sequence, Rev. 1
2-PAT-4.0, Initial Criticality And Low Power Test Sequence, Rev. 2
2-PET-102, Pre-Power Escalation NIS Calibration Data, Rev. 0
2-PET-103, Reactivity Computer (ADRC), Rev. 0
2-PET-201, Initial Criticality and Low Power Physics Testing, Rev. 1
2-SI-0-11, Estimated Critical Position, Rev. 1
2-SI-0-12, Core Reactivity, Rev. 2
2-SI-0-12, Core Reactivity, Rev. 4
2-SI-0-23, Moderator Temperature Coefficient Determination At BOL, Rev. 1
2-SI-0-23, Moderator Temperature Coefficient Determination At BOL, Rev. 2
2-SI-0-25, Negative MTC Maintenance Calculation, Rev. 0
2-SI-0-27, Mode 2 Physics Test Exceptions RCS Critical Boron Concentration and RCS Temperature, Rev. 0
2-SI-92-131, 31 Day Channel Operational Test Of Source And Intermediate Range Neutron Flux Channel I, Rev. 2
2-SI-92-132, 31 Day Channel Operational Test Of Source And Intermediate Range Neutron Flux Channel II, Rev. 2
2-TI-438, Watts Bar Nuclear Plant Unit 2 Power Ascension Test Program, Rev. 5
2-TI-7.021 Beacon Administration, Rev. 0
2-TI-7.021, BEACON Administration, Rev. 0
2-TI-7.031, Estimated Critical Condition Calculation, Rev. 2
2-TI-7.032, ICCR Monitoring, Rev. 1
2-TI-7.032, ICRR Monitoring, Rev. 1

NPG-SPP-01.2.1, Interim Administration of Site Technical Programs and Procedures for Watts Bar 1 and 2, Rev 2
NPG-SPP-10.4, Reactivity Management Program, Rev. 6
NPG-SPP-22.300, Corective Action Program, Rev. 5
NPG-SPP-22.300, Corrective Action Program, Rev. 5
NPG-SPP-22.302, Corrective Action Program Screening, Rev. 8

50.59 Reviews:
DCN 66327-A, TRM change for narrow range RTD response time

Drawings:
2-47W809-1, CVCS

Miscellaneous:
Control Room Logs
FSAR Chapter 14, Sections 14.2.10.3, 14.2.10.4, 14.2.10.5
Predicted 1/M Plots
Unit 0, 1, & 2 Chemistry Manual, Chapter 3.01 System Chemistry Specifications, Rev. 102
Watts Bar 2 Nuclear Operating Book (NOB), Rev. 5
Watts Bar Nuclear Plant, Unit 2, Cycle 1 Core Operating Limits Report, Rev. 1
Watts Bar Technical Specification 3.1 Reactivity Controls

SU 1.18 Startup Test Witnessing and Observation (Inspection Procedure 72302)
Procedures
2-PAT-4.0, Initial Criticality And Low Power Test Sequence, Rev. 2
2-PET-201, Initial Criticality And Low Power Physics Testing, Rev. 1
2-SI-0-12, Core Reactivity, Rev. 4
2-SI-0-23, Moderator Temperature Coefficient Determination At BOL, Rev. 2
2-SI-0-25, Negative MTC Maintenance Calculation, Rev. 0
2-SI-0-27, Mode 2 Physics Test Exceptions RCS Critical Boron Concentration And RCS Temperature, Rev. 0
2-GO-2, Reactor Startup, Rev. 3
2-CM-5.08, Start Up Primary Chemistry Control, Rev. 1
2-CM-6.21, Sampling The Pressurizer Liquid, Rev. 3
2-CM-6.24, Sampling CVCS Mixed Bed Demineralizers, Rev. 1

Work Orders
WO 115947713, 2-SI-0-23 Moderator Temperature Coefficient Determination At BOL
WO 117827845, 2-SI-0-12 Core Reactivity
WO 115931025, PAT Perform 1-PAT-4.0 Initial Criticality And Low Power Test Sequence
WO 117544244, RXE Perform 2-PET-201 DRWM Physics Testing In Mode 2

Miscellaneous
Unit 0, 1, & 2 Chemistry Manual, Chapter 3.01 System Chemistry Specifications, Rev. 102
Control Room Logs

Condition Reports
CR 1173643, Procedure Use And Adherence Error During U2 CVCS/PZR Sampling
CR 1173995, Review Criteria Exceeded For Unit 2 Cycle 1 Boron Endpoint
CR 1174136, Unit 2 Source Range Difference Impact on 2-TI-7.032
CR 1174139, Unit 2 Initial Intermediate Range Indications And 2-SI-92-2
CR 1174140, Unit 2 ICS “ICRR” Screen Error
CR 1179178, Missing Initials And N/As On The Pre-Job Brief Checklist For 2-PAT-4.0
CR 1179267, U2 NRC Inspector Identified Missing Information In 2-PET-201 PJB

SU 1.19 Startup Test Results (Inspection Procedures 72301)

Procedures

2-PAT-4.0, Initial Criticality And Low Power Test Sequence, Rev. 2
2-PET-201, Initial Criticality And Low Power Physics Testing, Rev. 1
2-SI-0-12, Core Reactivity, Rev. 4
2-SI-0-23, Moderator Temperature Coefficient Determination At BOL, Rev. 2

Work Orders

WO 115947713, 2-SI-0-23 Moderator Temperature Coefficient Determination At BOL
WO 117827845, 2-SI-0-12 Core Reactivity
WO 115931025, PAT Perform 1-PAT-4.0 Initial Criticality And Low Power Test Sequence
WO 117544244, RXE Perform 2-PET-201 DRWM Physics Testing In Mode 2

Condition Reports

CR 1173995, Review Criteria Exceeded For Unit 2 Cycle 1 Boron Endpoint
CR 1174136, Unit 2 Source Range Difference Impact on 2-TI-7.032
CR 1174139, Unit 2 Initial Intermediate Range Indications And 2-SI-92-2
CR 1174140, Unit 2 ICS “ICRR” Screen Error
CR 1179178, Missing Initials And N/As On The Pre-Job Brief Checklist For 2-PAT-4.0
CR 1179267, U2 NRC Inspector Identified Missing Information In 2-PET-201 PJB

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
BOL	beginning of life
BSL	Business Support Library
CERPI	computer enahnced rod position indicators
CFR	*Code of Federal Regulations*
CR	condition report
CVCS	chemical and volume control system
ECCS	emergency core cooling system
ERCW	essential raw cooling water
ESFAS	engineered safeguards features actuation system
FSAR	final safety analysis report
IMC	inspection manual chapter (NRC)
IP	inspection procedure
LCO	limiting condition for operation
MTC	moderator temperature coefficient
NCV	non-cited violation
No.	number
NRC	Nuclear Regulatory Commission
RCS	reactor coolant system
PTI	preoperational test instruction
QA	quality assurance
Rev.	revision
RPS	reactor protection system
SER	Safety Evaluation Report
SI	Surveillance Instruction
SL	severity level
TS	Technical Specification
TVA	Tennessee Valley Authority
WBN	Watts Bar Nuclear Plant
WO	work order