



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 16, 2018

Mr. Joseph W. Shea
Vice President, Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – ISSUANCE OF AMENDMENT TO
EXTEND SURVEILLANCE REQUIREMENTS 3.3.1.5, 3.3.2.2, AND 3.3.6.2
SPECIFIED INTERVALS (EPID L-2018-LLA-0187)

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 121 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (Watts Bar), Unit 1. The amendment is in response to your application dated July 8, 2018, as supplemented by letters dated July 24 and July 30, 2018.

This amendment extends Technical Specification (TS) Surveillance Requirements (SRs) 3.3.1.5, 3.3.2.2, and 3.3.6.2 by revising the Watts Bar, Unit 1, TS SR 3.0.2 and certain SRs in Table SR 3.0.2-1.

A copy of the related safety evaluation is also enclosed. Notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "Natreon Jordan", with a long horizontal line extending to the right.

Natreon Jordan, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures:

1. Amendment No. 121 to NPF-90
2. Safety Evaluation



UNITED STATES
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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 121
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (TVA, the licensee) dated July 8, 2018, as supplemented by letters dated July 24 and July 30, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 121 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, and shall be implemented immediately.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Facility Operating
License No. NPF-90 and
Technical Specifications

Date of Issuance: August 16, 2018

ATTACHMENT TO AMENDMENT NO. 121

WATTS BAR NUCLEAR PLANT, UNIT 1

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace page 3 of Facility Operating License No. NPF-90 with the attached revised page 3. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.0-4

3.0-6

3.0-7

INSERT

3.0-4

3.0-6

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- (4) TVA, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis, instrument calibration, or other activity associated with radioactive apparatus or components; and
 - (5) TVA, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below.
- (1) Maximum Power Level
TVA is authorized to operate the facility at reactor core power levels not in excess of 3459 megawatts thermal.
 - (2) Technical Specifications and Environmental Protection Plan
The Technical Specifications contained in Appendix A as revised through Amendment No. 121 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
 - (3) Safety Parameter Display System (SPDS) (Section 18.2 of SER Supplements 5 and 15)
Prior to startup following the first refueling outage, TVA shall accomplish the necessary activities, provide acceptable responses, and implement all proposed corrective actions related to having the Watts Bar Unit 1 SPDS operational.
 - (4) Vehicle Bomb Control Program (Section 13.6.9 of SSER 20)
During the period of the exemption granted in paragraph 2.D.(3) of this license, in implementing the power ascension phase of the approved initial test program, TVA shall not exceed 50% power until the requirements of 10 CFR 73.55(c)(7) and (8) are fully implemented. TVA shall submit a letter under oath or affirmation when the requirements of 73.55(c)(7) and (8) have been fully implemented.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during the MODES or other specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on inoperable equipment or variables outside specified limits.

SR 3.0.2 The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met. In addition, for each of the SRs listed in Table SR 3.0.2-1 the specified Frequency is met if the Surveillance is performed on or before the date listed on Table SR 3.0.2-1. The Surveillance Frequency extension limits expire on the dates listed in Table SR 3.0.2-1 or when the unit enters MODE 5, whichever occurs first.

For Frequencies specified as "once," the above interval extension does not apply.

If a Completion Time requires periodic performance on a "once per . . ." basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

(continued)

Table SR 3.0.2-1 (continued)		
Surveillance Requirement (SR)	Description of SR Requirement	Frequency Extension Limit
3.3.1.5, Table 3.3.1-1, Function 19	Perform RTS Instrumentation Actuation Logic Test of Automatic Trip Logic	10/1/18
3.3.2.2, Table 3.3.2-1, Function 1.b	Perform Engineered Safety Feature Actuation System (ESFAS) Instrumentation Actuation Logic Test of Safety Injection - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 2.b	Perform ESFAS Instrumentation Actuation Logic Test of Containment Spray - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 3.a(2)	Perform ESFAS Instrumentation Actuation Logic Test of Containment Isolation - Phase A Isolation	10/1/18
3.3.2.2, Table 3.3.2-1, Function 3.b(2)	Perform ESFAS Instrumentation Actuation Logic Test of Containment Isolation - Phase B Isolation	10/1/18
3.3.2.2, Table 3.3.2-1, Function 4.b	Perform ESFAS Instrumentation Actuation Logic Test of Steam Line Isolation - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 5.a	Perform ESFAS Instrumentation Actuation Logic Test of Turbine Trip and Feedwater Isolation - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 6.a	Perform ESFAS Instrumentation Actuation Logic Test of Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 7.a	Perform ESFAS Instrumentation Actuation Logic Test of Automatic Switchover to Containment Sump - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.6.2, Table 3.3.6-1, Function 2	Perform Containment Vent Isolation Instrumentation Actuation Logic Test of Automatic Actuation Logic and Actuation Relays	10/1/18



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 121

TO FACILITY OPERATING LICENSE NO. NPF-90

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

1.0 INTRODUCTION

By letter dated July 8, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18189A001), and supplemented by letters dated July 24 and July 30, 2018 (ADAMS Accession Nos. ML18206A416 and ML18215A055, respectively), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request (LAR) for Watts Bar Nuclear Plant (WBN), Unit 1. The LAR proposes to amend WBN Unit 1 Technical Specification (TS) Surveillance Requirement (SR) 3.0.2 and Table SR 3.0.2-1 to permit the extension of SRs 3.3.1.5, 3.3.2.2, and 3.3.6.2, on a one-time basis, to no later than October 1, 2018, or when the unit enters MODE 5, whichever occurs first. The licensee requested the U.S. Nuclear Regulatory Commission (NRC) approval of this LAR by August 16, 2018.

The NRC accepted this LAR for review on July 11, 2018, and issued a request for additional information (RAI) to support this evaluation on July 17, 2018 (ADAMS Accession No. ML18199A182). By letters dated July 24 and July 30, 2018, the licensee provided responses to the NRC RAIs.

The supplemental letters dated July 24 and July 30, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally notified, and did not change the NRC staff's proposed no significant hazards consideration determination as published in the *Federal Register* on July 16, 2018 (83 FR 32912).

2.0 REGULATORY EVALUATION

2.1 Description

The reactor protection system is designed to initiate a unit shutdown based on preselected values of unit parameters to protect against violating core fuel design limits and the reactor coolant system (RCS) pressure boundary. The system consists of field transmitters or sensors, signal process control and protection system, the solid state protection system (SSPS), and the reactor trip switchgear.

The engineered safety features actuation system (ESFAS) initiates necessary safety systems, based on the values of selected unit parameters, to protect against violating core design limits and the RCS pressure boundary, and to mitigate accidents. The ESFAS instrumentation includes field transmitters or process sensors, signal processing equipment, and the SSPS. The SSPS processes the outputs of the signal processing equipment and performs the decision logic processing.

The containment vent isolation (CVI) instrumentation is designed to close the containment isolation valves in the containment purge system. This isolates the containment atmosphere from the environment to minimize releases of radioactive material in the event of an accident.

The TSs contain SRs for instrumentation in the reactor protection system, ESFAS, and CVI system. The SRs include performance of a channel check, actuation logic test, master relay test, channel operational test, slave relay test, and trip actuation device operational test for various components of the systems.

2.2 Description of Changes

Surveillance Requirement 3.0.2 currently states, in part:

The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met. In addition, for each of the SRs listed in Table SR 3.0.2-1 the specified Frequency is met if the Surveillance is performed on or before the date listed on Table SR 3.0.2-1. This extension of the test intervals for these SRs is permitted on a one-time basis to be completed no later than November 30, 2017.

The proposed change would delete the last sentence in SR 3.0.2 and replace it with:

The Surveillance Frequency extension limits expire on the dates listed in Table SR 3.0.2-1 or when the unit enters MODE 5, whichever occurs first.

Table SR 3.0.2-1 currently contains a list of SRs that were extended until November 30, 2017. The licensee is proposing to delete the SRs that are currently listed in the table. These SRs are being deleted from Table SR 3.0.2-1 because the extension date has already passed.

The licensee proposes to modify Table SR 3.0.2-1 to add the selected instrumentation SRs. The revised Table SR 3.0.2-1 would state:

Surveillance Requirement (SR)	Description of SR Requirement	Frequency Extension Limit
3.3.1.5, Table 3.3.1-1, Function 19	Perform Reactor Trip System (RTS) Instrumentation Actuation Logic Test of Automatic Trip Logic	10/1/18
3.3.2.2, Table 3.3.2-1, Function 1.b	Perform Engineered Safety Feature Actuation System (ESFAS) Instrumentation Actuation Logic Test of Safety Injection - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 2.b	Perform ESFAS Instrumentation Actuation Logic Test of Containment Spray - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 3.a(2)	Perform ESFAS Instrumentation Actuation Logic Test of Containment Isolation - Phase A Isolation	10/1/18

Surveillance Requirement (SR)	Description of SR Requirement	Frequency Extension Limit
3.3.2.2, Table 3.3.2-1, Function 3.b(2)	Perform ESFAS Instrumentation Actuation Logic Test of Containment Isolation - Phase B Isolation	10/1/18
3.3.2.2, Table 3.3.2-1, Function 4.b	Perform ESFAS Instrumentation Actuation Logic Test of Steam Line Isolation - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 5.a	Perform ESFAS Instrumentation Actuation Logic Test of Turbine Trip and Feedwater Isolation - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 6.a	Perform ESFAS Instrumentation Actuation Logic Test of Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.2.2, Table 3.3.2-1, Function 7.a	Perform ESFAS Instrumentation Actuation Logic Test of Automatic Switchover to Containment Sump – Automatic Actuation Logic and Actuation Relays	10/1/18
3.3.6.2, Table 3.3.6-1, Function 2	Perform Containment Vent Isolation Instrumentation Actuation Logic Test of Automatic Actuation Logic and Actuation Relays	10/1/18

2.3 Regulatory Review

The categories of items required to be in the TSs are provided in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c). As required by 10 CFR 50.36(c)(3), the TSs include items in the category of SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation (LCOs) will be met. The regulation under 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the TSs.

The regulatory requirements and guidance which the NRC staff considered in its review of the application are as follows:

- The regulation under 10 CFR Part 50 establishes the fundamental regulatory requirements with respect to the domestic licensing of nuclear production and utilization facilities. Specifically, Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50 provides, in part, the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety.

The following 10 CFR Part 50 Appendix A General Design Criteria (GDC) for WBN Unit 1 are related to the evaluation of this LAR:

- GDC 13, “Instrumentation and control,” requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the RCS pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

- GDC 20, "Protective system functions," requires the protection system be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.
- GDC 21, "Protection system reliability and testability," requires that the system be designed for high functional reliability and in service testability, with redundancy and independence sufficient to preclude loss of the protection function from a single failure and preservation of minimum redundancy despite removal from service of any component or channel.
- GDC 22, "Protection system independence," requires that the system be designed so that natural phenomena, operating, maintenance, testing, and postulated accident conditions do not result in loss of the protection function.
- 10 CFR 50.36, "Technical specifications," states, in part, that "[e]ach applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section." Specifically, 10 CFR 50.36(c)(2)(ii) sets forth four criteria to be used in determining whether an LCO is required to be included in the TS.
- The NRC staff's guidance for review of TSs is in Chapter 16, *Technical Specifications*, of NUREG-0800, Revision 3, *Standard Review Plan* (March 2010) (ADAMS Accession No. ML100274425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared Standard Technical Specifications (STS) (NUREG-1430 to NUREG-1434) for each of the light-water reactor nuclear steam supply systems and associated balance-of-plant equipment systems. Accordingly, the NRC staff's review includes consideration of whether the proposed TSs are consistent with the applicable reference TS (i.e., the current STS). The NRC's guidance for the format and content of TSs can be found in NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," April 2012 (ADAMS Accession No. ML12100A222).

3.0 TECHNICAL EVALUATION

On June 13, 2018, the WBN Unit 1 Reactor Trip Breaker (RTB) B opened unexpectedly while performing Surveillance Instruction (SI) 1-SI-99-10-B, "62 Day Functional Test of SSPS train B and Reactor Trip Breaker B." At the time of the event, WBN Unit 1 was in MODE 1 at 100 percent power. The unit did not trip because the train B bypass breaker was closed during the test.

Troubleshooting was performed to determine the cause of RTB B opening. This troubleshooting entailed taking test voltage measurements, replacing two universal logic circuit boards and reseating of an under voltage driver circuit board. Post-maintenance testing was then performed which demonstrated that the SSPS train B was capable of performing required safety functions. However, during the testing of the memories portion of the circuitry, RTB B opened again when the intermediate range trip function was selected for testing.

The licensee has determined that the cause of the unexpected opening of RTB B was an anomaly associated with the SSPS train B test circuitry when aligned to the intermediate range

trip circuits of the universal logic board (see Section 2.3 of the Enclosure to the LAR dated July 8, 2018). Test voltages of the undervoltage (UV) signal to the RTB showed that the driving voltage signal to the RTB UV coil decreased to a low voltage level when the test switches were aligned to test the intermediate range safety functions of the system. This condition was found to be repeatable whenever the same test configuration was established. Though testing and further troubleshooting activities were suspended, the tests that were completed prior to the occurrence of the failure showed that logic functional tests for all train B safety functions had passed, indicating that safety system logic functionality was not adversely affected by the test circuit fault.

The NRC staff reviewed surveillance test data as well as troubleshooting documentation, which included voltage measurements taken, and confirmed there is no evidence of safety system logic function failure of the operational portion of the SSPS train B. This conclusion is consistent with the operability determination made by the licensee on July 6, 2018, which was that the intermediate range neutron flux trip testing circuit is degraded and that the SSPS train B remains fully functional. This operability determination supports the licensee's prior decision to exit TS LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation."

The licensee performed a qualitative risk assessment to compare the risk level associated with the following alternative courses of action. The licensee provided descriptions in the RAI responses dated July 24 and July 30, 2018:

1. Repair SSPS train B test circuitry during power operation,
2. Shut the unit down to MODE 5 to repair the test circuitry,
3. Complete the surveillance using jumpers to mimic the function of the memories test switch, and
4. Delay performance of the specified surveillance testing until the refueling outage which is scheduled for September 2018 unless WBN Unit 1 enters MODE 5 before then.

The licensee stated that the proposed extension offered the lowest risk among the four options available. No numerical support for the conclusion was submitted. Because the LAR is not a risk-informed application, the staff did not review the method used by the licensee to derive risk insights. The evaluation performed was not used to support a risk-informed decision by the staff. However, the staff considered the insights provided, judged that they were reasonable, and determined that they did not challenge the conclusion that the proposed change maintains defense-in-depth.

In its application dated July 8, 2018, the licensee stated that though the fault is limited to the intermediate range test portion of the test circuit, continued tests of other SSPS functions cannot be performed without substantial risk to the safety system operability. The risk assessment determined that deferral of surveillance testing to the upcoming outage (alternative 4) was a preferred action based on "the history of unsuccessful repairs and the continued operability of the SSPS system for power operations." The portion of the SSPS subsystem that is impacted is the testing portion of the system and continued monitoring reveals no adverse effects during non-testing conditions.

Furthermore, the licensee stated that due to the anomaly in the SSPS train B test circuitry, the risk associated with performing the repairs of the test circuitry and completing the required

surveillance tests while at power or continuing the troubleshooting and testing, is deemed unacceptable for completion of the SRs specified in the discussion below.

The NRC staff determined that the modification of Table SR 3.0.2-1 to delete the list of SRs whose extended performance dates have expired is considered an editorial change and is acceptable.

The regulation at 10 CFR 50.36(a)(1) states, in part, that “[a] summary statement of the bases or reasons for such specifications, other than those covering administrative controls shall also be included in the application, but shall not become part of the technical specifications.” Accordingly, along with the proposed TS changes, the licensee also submitted the changes to the TS Bases corresponding to the proposed TS changes in order to provide the reasons for the TSs. The NRC staff notes that the licensee will update the Bases in accordance with TS 5.6, the TS Bases Control Program.

The NRC staff notes that although the requested surveillance interval extension is not within the requirement to test one train in 115 days (92 days plus the 25 percent allowance of SR 3.0.2) of the test of the other train, it remains within the interval of 230 days (184 days plus the 25 percent allowance) between successive tests of the channels within train B. Because of this, functions associated with SR 3.3.1.5, 3.3.2.2, and 3.3.6.2, for which an extension is requested, can reasonably be expected to operate as long as 230 days between surveillances. These functions have been surveilled within 230 days of the proposed extension date of October 1, 2018.

The SRs listed in Section 3.1 through 3.3 of this safety evaluation are required to be performed before the upcoming WBN Unit 1 Cycle 15 refueling outage (U1R15), scheduled to commence in September 2018. The NRC staff reviewed each of the proposed TS changes to ensure that they do not impact compliance with the regulations listed in Section 2.0 of this SE. The following are evaluations for each of these TS changes in the order they were presented in the amendment request.

3.1 SR 3.3.1.5, Table 3.3.1-1, “Reactor Trip System Instrumentation,”
Function 19, Perform reactor trip system instrumentation actuation logic
test of automatic trip logic

Attachment 5 to the Enclosure of the LAR dated July 8, 2018, discusses the proposed one-time SR frequency extension for SR 3.3.1.5 – Perform RTS Instrumentation Actuation Logic Test of Automatic Trip Logic. This SR verifies the system’s ability to interrupt the power to the control rod drive mechanisms, which will allow the rods to fall into the reactor core.

This SR is performed every 92 days on a staggered test basis, so that both trains are tested at least once every 184 days. This SR was last successfully performed on February 16, 2018, and is due to be performed prior to August 17, 2018. The scope of this extension will delay the required performance of RTS automatic trip logic testing 45 days, from the current required performance date of August 17, 2018, to October 1, 2018.

In the LAR dated July 8, 2018, the licensee provided the following justification for allowing this interval extension.

TVA has reviewed the last successful performance of RTS Train B for SR 3.3.1.5 for TS Table 3.3.1-1, Function 19 and performed a review of operating experience to determine the reliability of the SSPS trip matrix. Based on this

review, TVA determined that extending this SR ... is acceptable and will have no adverse effect on the functionality of the RTS trip function as stated in the WBN Unit 1 accident analysis.

The NRC staff reviewed the operating experience data provided in Table 2 of the LAR Enclosure and noted that no train B automatic actuation logic failures were detected during the period between June 4, 2015, and February 16, 2018. The licensee also provided data showing satisfactory performance of similar equipment in train A of WBN Unit 1 as well as data from both trains of similar equipment in WBN Unit 2.

In addition, in its application dated July 8, 2018, the licensee proposed to change SR 3.0.2 which includes a proposed requirement to complete the surveillance SR 3.3.1.5 Function 19, if the unit enters MODE 5 prior to the WBN U1R15 outage. This is acceptable because the risks associated with performing the necessary repairs and testing would be greatly reduced when the unit is in MODE 5 thus eliminating the unacceptable risk basis for the surveillance extension.

Based on train B being surveilled within 230 days of the proposed extension date, demonstrated successful past performance of the affected components, and the proposed requirement to perform SR 3.3.1.5 for train B if the unit enters MODE 5 within the requested surveillance interval, the NRC staff determined there is reasonable assurance the components associated with Function 19 will remain operable during the extended surveillance interval period.

3.2 SR 3.3.2.2, Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation"

The SR extension applies to the following functions listed in TS Table 3.3.2-1, Engineered Safety Feature Actuation System Instrumentation:

Function	Description
1.b	Safety Injection - automatic actuation logic and actuation relays
2.b	Containment Spray - automatic actuation logic and actuation relays
3.a(2)	Containment isolation - Phase A isolation
3.b(2)	Containment isolation - Phase B isolation
4.b	Steam line isolation - automatic actuation logic and actuation relays
5.a	Turbine trip and feedwater isolation – automatic actuation logic and actuation relays
6.a	Auxiliary feedwater - automatic actuation logic and actuation relays
7.a	Automatic switchover to containment sump – automatic actuation logic and actuation relays

Attachment 6 to the Enclosure of the LAR dated July 8, 2018, discusses the proposed one-time SR frequency extension for SR 3.3.2.2 – Perform ESFAS Instrumentation Actuation Logic Test. This SR verifies the capability of the SSPS system to perform automatic actuation logic and to control actuation relays used for actuating engineered safety feature equipment.

This SR is performed every 92 days on a staggered test basis, so that both trains are tested at least once every 184 days. This SR was last successfully performed on February 16, 2018, and is due to be performed prior to August 17, 2018. The scope of this extension will delay the

required performance of ESFAS automatic actuation logic testing 45 days, from the current required performance date of August 17, 2018, to October 1, 2018.

In its letter dated July 8, 2018, the licensee provided the following justification for allowing this interval extension.

TVA has reviewed the last successful performance of ESFAS actuation logic test for SR 3.3.2.2 for TS Table 3.3.2-1, Functions 1.b, 2.b, 3.a(2), 3.b(2), 4.b, 5.a, 6.a, and 7.a and performed a review of operating experience to determine the reliability of the SSPS trip matrix. Based on this review, TVA determined that extending this SR ... is acceptable and will have no adverse effect on the functionality of the RTS trip function as stated in the WBN Unit 1 accident analysis.

The NRC staff reviewed the operating experience data provided in Table 2 of the LAR Enclosure and noted that no train B automatic actuation logic failures were detected during the period between June 4, 2015, and February 16, 2018. The licensee also provided data showing satisfactory performance of similar equipment in train A of WBN Unit 1 as well as data from both trains of similar equipment in WBN Unit 2.

In addition, in its application dated July 8, 2018, the licensee proposed to change SR 3.0.2 which includes a proposed requirement to complete the surveillance SR 3.3.2.2 Functions 1.b, 2.b, 3.a(2), 3.b(2), 4.b, 5.a, 6.a, and 7.a, if the unit enters MODE 5 prior to the WBN U1R15 outage. This is acceptable because the risks associated with performing the necessary repairs and testing would be greatly reduced when the unit is in MODE 5 thus eliminating the unacceptable risk basis for the surveillance extension.

Based on train B being surveilled within 230 days of the proposed extension date, demonstrated successful past performance of the affected components, and the proposed requirement to perform SR 3.3.2.2 for train B if the unit enters MODE 5 within the requested surveillance interval, the NRC staff determined there is reasonable assurance the components associated with Functions 1.b, 2.b, 3.a(2), 3.b(2), 4.b, 5.a, 6.a, and 7.a will remain operable during the extended surveillance interval period.

3.3 SR 3.3.6.2, Table 3.3.6-1, Function 2, Perform containment vent isolation instrumentation actuation logic test of automatic actuation logic and actuation relays

Attachment 7 to the Enclosure of the LAR dated July 8, 2018, discusses the proposed one-time SR frequency extension for SR 3.3.6.2 – Perform Containment Vent Isolation Instrumentation Actuation Logic Test of Automatic Actuation Logic and Actuation Relays. The purpose of this function is to isolate the containment atmosphere from the environment to minimize release of radioactivity in the event of an accident while the plant is in MODES 1, 2, 3, and 4. This SR verifies the capability of CVI instrumentation to close the containment isolation valves in the containment purge system on a safety injection signal.

This SR is performed every 92 days on a staggered test basis, so that both trains are tested at least once every 184 days. This SR was last successfully performed on February 16, 2018, and is due to be performed prior to August 17, 2018. The scope of this extension will delay the required performance of reactor trip system automatic trip logic testing 45 days, from the current required performance date of August 17, 2018, to October 1, 2018.

In its letter dated July 8, 2018, the licensee provided the following justification for allowing this interval extension.

TVA has reviewed the last successful performance of SR 3.3.6.2 for TS Table 3.3.6, Function 2, and performed a review of operating experience to determine the reliability of the SSPS trip matrix. Based on this review, TVA has determined that extending this SR ... is acceptable and will have no adverse effect on the functionality of the CVI function as stated in the WBN Unit 1 accident analysis.

The NRC staff reviewed the operating experience data provided in Table 2 of the LAR Enclosure and noted that no train B automatic actuation logic failures were detected during the period between June 4, 2015, and February 16, 2018. The licensee also provided data showing satisfactory performance of similar equipment in train A of WBN Unit 1 as well as data from both trains of similar equipment in WBN Unit 2.

In addition, in its application dated July 8, 2018, the licensee proposed to change SR 3.0.2 which includes a proposed requirement to complete the surveillance SR 3.3.6.2 Function 2, if the unit enters MODE 5 prior to the WBN U1R15 outage. This is acceptable because the risks associated with performing the necessary repairs and testing would be greatly reduced when the unit is in MODE 5 thus eliminating the unacceptable risk basis for the surveillance extension.

Based on train B being surveilled within 230 days of the proposed extension date, demonstrated successful past performance of the affected components, and the proposed requirement to perform SR 3.3.6.2 for train B if the unit enters MODE 5 within the requested surveillance interval, the NRC staff determined there is reasonable assurance the components associated with Function 2 will remain operable during the extended surveillance interval period.

3.4 NRC Staff Conclusion

Based on demonstrated successful past performance of the affected components, identified instrument data, satisfactory partial completion of SRs, and the additional requirement to perform the affected train B surveillance tests if the unit enters MODE 5 within the requested surveillance interval, the NRC staff determined the proposed surveillance extension request meets the requirements of 10 CFR 50.36 and 10 CFR Part 50 Appendix A GDC 13, GDC 20, GDC 21, and GDC 22. The staff concludes that the proposed changes to the TSs provide reasonable assurance of adequate protection of public health and safety. On this basis, the NRC staff concludes that the proposed TS changes are acceptable.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC's regulation in 10 CFR 50.92(c) states that the NRC may make a final determination, under the procedures in 10 CFR 50.91, that a license amendment involves no significant hazards consideration (NSHC) if operation of the facility, in accordance with the amendment, would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

In its letter dated July 8, 2018, the licensee provided its analysis about the issue of NSHC. The licensee's analysis is as follows:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The requested action is an extension to the performance interval of a limited number of TS surveillance requirements. The performance of these surveillances, or the extension of these surveillances, is not a precursor to an accident. Performing these surveillances or failing to perform these surveillances does not affect the probability of an accident. Therefore, the proposed delay in performance of the SRs in this amendment request does not increase the probability of an accident previously evaluated.

A delay in performing these surveillances does not result in a system being unable to perform its required function. In the case of this one-time extension request, the short period of additional time that the systems and components will be in service before the next performance of the surveillance will not affect the ability of those systems to operate as designed. Therefore, the systems required to mitigate accidents will remain capable of performing their required function. No new failure modes have been introduced because of this action and the consequences remain consistent with previously evaluated accidents. On this basis, the proposed delay in performance of the SRs in this amendment request does not involve a significant increase in the consequences of an accident.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed amendment does not involve a physical alteration of any system, structure, or component (SSC) or a change in the way any SSC is operated. The proposed amendment does not involve operation of any SSCs in a manner or configuration different from those previously recognized or evaluated. No new failure mechanisms will be introduced by the one-time SR extensions being requested.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The proposed amendment is a one-time extension of the performance interval of a limited number of TS SRs. Extending these SRs does not involve a modification of any TS limiting condition for operation. Extending these SRs does not involve a change to any limit on accident consequences specified in the license or regulations. Extending these SRs does not involve a change in how accidents are mitigated or a significant increase in the consequences of an accident. Extending these SRs does not involve a change in a methodology used to evaluate consequences of an accident. Extending these SRs does not involve a change in any operating procedure or process. Operating history has demonstrated that the WBN Units 1 and 2 SSPS is highly reliable. A review of the test results has not revealed any automatic logic failures. Based on the limited additional period of time that the systems and components will be in service before the surveillances are next performed, as well as the operating experience that these surveillances are typically successful when performed, it is reasonable to conclude that the margins of safety associated with these SRs will not be affected by the requested extension.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

The NRC staff reviewed the licensee's analysis and concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendment and that the amendment should be issued as allowed by the criteria contained in 10 CFR 50.91.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendments on August 7, 2018. The State official had no comments.

5.0 PUBLIC COMMENTS

On July 16, 2018, the NRC staff published a "Notice of Consideration of Issuance of Amendments to Facility Operating Licenses, Proposed No Significant Hazards Consideration Determination, and Opportunity for a Hearing," in the *Federal Register* associated with the proposed amendment request (83 FR 32912). In accordance with the requirements in 10 CFR 50.91, the notice provided a 30-day period for public comment on the proposed NSHC determination. One public comment (ADAMS Accession No. ML18199A091) was received regarding the proposed amendment and it was within the scope of the proposed NSHC which was included in the July 16, 2018, notice. The public comment and the NRC staff response are provided below.

5.1 Proposed Changes to TS SRs 3.3.1.5, 3.3.2.2, and 3.3.6.2

Public Comment

This request is confusing and leads me to believe that the applicant is not telling the whole story, as required by 10 CFR 50.9.

In one place they claim that testing and troubleshooting will not trip the reactor because the bypass breaker is closed. In another place in the application, they claim that performing troubleshooting and testing is too risky. What is the risk to performing testing? Is it a risk to the plant or personnel or both?

The applicant states that the RTB tripped when aligned to the intermediate range trip circuitry. The Watts Bar Technical Specification Bases for Surveillance Requirement 3.3.1.5 states that it tests "all possible logic combinations, with and without applicable permissives." If the RTB tripped when it wasn't supposed to, did the actuation logic pass the test? If the test failed, should they be allowed to continue operating?

The applicant states that the troubleshooting requires the SSPS train to be powered down. The applicant also states the SSPS train can be powered down for 30 hours before the reactor is required to be in mode 3. Finally, the applicant timeline to perform troubleshooting is given as 24 hours.

If all of this is true, why don't they perform the troubleshooting and figure out what is wrong with the system? Maybe they wouldn't need to ask permission to continue operation without knowing whether the reactor will trip when it needs to.

Maybe the real risk is to the public.

NRC Response

As presented in Section 3.0 of the safety evaluation, the NRC staff reviewed surveillance test data as well as troubleshooting documentation, which included voltage measurements taken, and confirmed that there is no evidence of safety system logic function failure of the operational portion of the SSPS train B.

The NRC staff reviewed the four potential paths for recovering the test circuit functionality, including troubleshooting and correcting the test circuitry while at power, as described in licensee's application dated July 8, 2018, and the RAI responses dated July 24 and July 30, 2018. The licensee determined that risk from troubleshooting and repairing the test circuitry at power was less desirable than the path approved in the license amendment. This is because closing the bypass breaker for an extended period of time to support repairs reduces the reliability of the RPS and placing the testing circuit with a known fault back into service could result in actual degradation of the safety circuit itself. The increased risk to the safety circuit that is operable was considered unacceptable. The NRC staff review confirmed that the short extension to the surveillance requirement to allow for repairs during the scheduled outage or whenever MODE 5 was entered was an acceptable method for resolving the test circuit degradation issue.

The safety system logic functionality is tested independently from RTB functionality. As such, the trip logic was found to be fully functional during post-maintenance testing activities.

Troubleshooting also revealed that the cause of the RTB trip was the faulty test circuitry which is normally isolated from the safety circuitry. The licensee concluded that the RTB remains operable. The NRC staff reviewed the licensee operability determination and indicated that the licensee's conclusions were reasonable and supported by the post-maintenance testing. The NRC staff noted that in this instance although the fault is inhibiting the ability of the operators to perform certain tests, there is no indication that the safety system would not be able to perform its intended function, if necessary.

The estimated time to perform repair activities was "... up to 132 hours" as provided by the licensee in Section 3.2.2 of the enclosure to the LAR. This is much longer than the allowed 30 hours after which the plant would need to be placed into MODE 3. It is also longer than the total time of 60 hours which would require the plant to be placed into MODE 5 per TS 3.3.2. While the licensee considered the option of performing troubleshooting efforts at power, it decided against that path because of the high likelihood that a repair would not be completed in time to avoid the TS required plant shutdown. The safety system challenges associated with having a forced shutdown occurring simultaneously with ongoing troubleshooting and repairs to the test circuit, the risks discussed above with operating the plant with bypass breaker closed for an extended time, and the potential for the testing circuit to induce a degraded condition on safety circuit when connected led the licensee to choose the proposed path for extending surveillance times. The NRC staff's review of the licensee's analysis determined that the proposed path was acceptable. The NRC staff concluded that the risk is acceptable and there is reasonable assurance that the health and safety of the public will not be endangered.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there was one public comment on such finding published in the *Federal Register* on July 16, 2018 (83 FR 32912). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: August 16, 2018

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – ISSUANCE OF AMENDMENT TO
 EXTEND SURVEILLANCE REQUIREMENTS 3.3.1.5, 3.3.2.2, AND 3.3.6.2
 SPECIFIED INTERVALS (EPID L 2018-LLA-0187) DATED AUGUST 16, 2018

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