

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

December 16, 2021

Mr. James Barstow Vice President, Nuclear Regulatory Affairs and Support Services Tennessee Valley Authority 1101 Market Street, LP 4A-C Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 150 AND 58 REGARDING MODIFICATION OF TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 3.6.15.4 (EPID L-2020-LLA-0270)

Dear Mr. Barstow:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 150 to Facility Operating License No. NPF-90 and Amendment No. 58 to Facility Operating License No. NPF-96 for the Watts Bar Nuclear Plant (Watts Bar), Units 1 and 2, respectively. These amendments are in response to your application dated December 15, 2020.

The amendments revise Technical Specification (TS) Surveillance Requirement 3.6.15.4, in TS 3.6.15, "Shield Building," to resolve a non-conservatism with respect to the Watts Bar accident analysis. The proposed changes would revise the shield building annulus pressure requirement, replace the inleakage requirement with a time requirement, and delete the shield building inleakage requirement of less than or equal to 250 cubic feet per minute.

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

Sincerely,

/**RA**/

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

Docket Nos. 50-390 and 50-391

Enclosures:

- 1. Amendment No. 150 to NPF-90
- 2. Amendment No. 58 to NPF-96
- 3. Safety Evaluation

cc: Listserv



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 150 License No. NPF-90

- 1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (TVA, the licensee) dated December 15, 2020, 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) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A as revised through Amendment No. 150 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 within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

David J. Wrona, Chief Plant Licensing Branch II-2 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to the Operating License and Technical Specifications

Date of Issuance: December 16, 2021

ATTACHMENT TO AMENDMENT NO. 150

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 page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains vertical lines indicating the area of change.

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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) <u>Maximum Power Level</u>

TVA is authorized to operate the facility at reactor core power levels not in excess of 3459 megawatts thermal.

(2) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A as revised through Amendment No. 150 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) <u>Safety Parameter Display System (SPDS) (Section 18.2 of SER</u> <u>Supplements 5 and 15)</u>

> 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) <u>Vehicle Bomb Control Program (Section 13.6.9 of SSER 20)</u>

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.

SURVEILLANCE REQUIREMENTS

	FREQUENCY	
SR 3.6.15.1	Verify annulus negative pressure is equal to or more negative than -1 inches water gauge with respect to the atmosphere.	In accordance with the Surveillance Frequency Control Program
SR 3.6.15.2	Verify the door in each access opening is closed, except when the access opening is being used for normal transient entry and exit.	In accordance with the Surveillance Frequency Control Program
SR 3.6.15.3	Verify shield building structural integrity by performing a visual inspection of the exposed interior and exterior surfaces of the Shield Building.	During shutdown for SR 3.6.1.1 Type A tests
SR 3.6.15.4	Verify the Shield Building can be maintained at an annulus pressure equal to or more negative than -0.63 inch water gauge at elevation 783 with respect to the atmosphere by one Emergency Gas Treatment System train with final flow \geq 3600 and \leq 4400 cfm within 20 seconds after a start signal.	In accordance with the Surveillance Frequency Control Program



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-391

WATTS BAR NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 58 License No. NPF-96

- 1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (TVA, the licensee) dated December 15, 2020, 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-96 is hereby amended to read as follows:
 - (2) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A as revised through Amendment No. 58 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 within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

David J. Wrona, Chief Plant Licensing Branch II-2 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to the Operating License and Technical Specifications

Date of Issuance: December 16, 2021

ATTACHMENT TO AMENDMENT NO. 58

WATTS BAR NUCLEAR PLANT, UNIT 2

FACILITY OPERATING LICENSE NO. NPF-96

DOCKET NO. 50-391

Replace page 3 of Facility Operating License No. NPF-96 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 page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains vertical lines indicating the area of change.

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- C. The 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) <u>Maximum Power Level</u>

TVA is authorized to operate the facility at reactor core power levels not in excess of 3459 megawatts thermal.

(2) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A as revised through Amendment No. 58 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) TVA shall implement permanent modifications to prevent overtopping of the embankments of the Fort Loudon Dam due to the Probable Maximum Flood by June 30, 2018.
- (4) PAD4TCD may be used to establish core operating limits until the WBN Unit 2 steam generators are replaced with steam generators equivalent to the existing steam generators at WBN Unit 1. FULL SPECTRUM LOCA Methodology shall be implemented when the WBN Unit 2 steam generators are replaced with steam generators equivalent to the existing steam generators at WBN Unit 1.
- (5) By December 31, 2019, the licensee shall report to the NRC that the actions to resolve the issues identified in Bulletin 2012-01, "Design Vulnerability in Electrical Power System," have been implemented.
- (6) The licensee shall maintain in effect the provisions of the physical security plan, security personnel training and qualification plan, and safeguards contingency plan, and all amendments made pursuant to the authority of 10 CFR 50.90 and 50.54(p).
- (7) TVA shall fully implement and maintain in effect all provisions of the Commission approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The TVA approved CSP was discussed in NUREG-0847, Supplement 28, as amended by changes approved in License Amendment No. 7.
- (8) TVA shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Report for the facility, as described in NUREG-0847, Supplement 29, subject to the following provision:

SURVEILLANCE REQUIREMENTS

	FREQUENCY	
SR 3.6.15.1	Verify annulus negative pressure is equal to or more negative than -1 inches water gauge with respect to the atmosphere.	In accordance with the Surveillance Frequency Control Program
SR 3.6.15.2	Verify the door in each access opening is closed, except when the access opening is being used for normal transient entry and exit.	In accordance with the Surveillance Frequency Control Program
SR 3.6.15.3	Verify shield building structural integrity by performing a visual inspection of the exposed interior and exterior surfaces of the Shield Building.	During shutdown for SR 3.6.1.1 Type A tests
SR 3.6.15.4 Verify the Shield Building can be maintained at an annulus pressure equal to or more negative than - 0.63 inch water gauge at elevation 783 with respect to the atmosphere by one Emergency Gas Treatment System train with final flow \geq 3600 and \leq 4400 cfm within 20 seconds after a start signal.		In accordance with the Surveillance Frequency Control Program



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 150 AND 58

TO FACILITY OPERATING LICENSE NOS. NPF-90 AND NPF-96

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-390 AND 50-391

1.0 INTRODUCTION

By letter dated December 15, 2020 (Agencywide Documents and Management System (ADAMS) Accession No. ML20350B764), the Tennessee Valley Authority (the licensee), submitted a license amendment request (LAR, application) to the U.S. Nuclear Regulatory Commission (NRC, the Commission) to revise the Watts Bar Nuclear Plant (Watts Bar), Units 1 and 2, Technical Specifications (TSs). The licensee requested changes to TS Surveillance Requirement (SR) 3.6.15.4, in TS 3.6.15, "Shield Building," to resolve a non-conservatism with respect to the Watts Bar loss-of-coolant accident (LOCA) analysis described in Section 15.4 of Chapter 15 of the Watts Bar, Units 1 and 2, Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML20323A316). The proposed changes would revise the shield building annulus pressure requirement, replace the inleakage requirement with a time requirement, and delete the shield building inleakage requirement of less than or equal to 250 cubic feet per minute (cfm).

2.0 REGULATORY EVALUATION

2.1 <u>System Description</u>

The following summary descriptions of affected systems are contained in Section 3.1 of the LAR, and Chapters 3 and 6 of the Watts Bar, Units 1 and 2, UFSAR (ADAMS Accession Nos. ML21123A226 and ML21123A227, respectively).

2.1.1 Shield Building

The shield building is a reinforced, concrete structure surrounding the steel containment vessel. An annulus space exists between the steel containment vessel and the inside of the shield building. The shield building is supported by a circular base slab and covered at the top with a spherical dome. The shield building for each unit is located adjacent to the auxiliary building and designed to:

- provide radiation shielding during accident conditions,
- provide radiation shielding from parts of the reactor coolant system during operation, and
- protect the steel containment vessel from adverse atmospheric conditions and external missiles propelled by tornado winds.

2.1.2 Containment

The containment is a low-leakage, freestanding steel pressure vessel surrounded by the reinforced concrete shield building. The annular space between the containment and shield building inner wall collects any containment leakage that may occur following a LOCA, and is designed to limit leakage below Part 100, "Reactor Site Criteria," of Title 10 to the *Code of Federal Regulations* (10 CFR). Containment piping penetration assemblies provide for the passage of process, service, sampling, and instrumentation pipelines into the containment vessel while maintaining containment integrity.

2.1.3 Emergency Gas Treatment System

The emergency gas treatment system (EGTS) establishes a negative pressure in the annulus between the shield building and the steel containment vessel. The EGTS consists of two separate and redundant trains. Each train includes a heater, a prefilter, moisture separators, a high efficiency particulate air filter, an activated charcoal adsorber section for removal of radioiodine, and a fan.

The EGTS is designed to:

- keep the air pressure within each shield building annulus below atmospheric pressure at all times in which the integrity of that particular containment is required,
- reduce the concentration of radioactive nuclides in annulus air that is released to the environment during a LOCA in either reactor unit to levels sufficiently low to keep the site boundary and low population zone dose rates below the 10 CFR Part 100 values,
- withstand the safe shutdown earthquake, and
- provide for initial and periodic testing of the system capability to function as designed.

2.1.4 Main Control Room

Watts Bar, Units 1 and 2, were designed to meet the intent of the "Proposed General Design Criteria for Nuclear Power Plant Construction Permits," published in July 1967. The Watts Bar construction permit was issued in January 1973. The Watts Bar dual-unit UFSAR, however, addresses the NRC General Design Criteria (GDC) published as Appendix A to 10 CFR Part 50

in July 1971, as amended on October 27, 1987. The GDC establish the minimum requirements for the principal design criteria for water-cooled nuclear power plants. The Watts Bar, Units 1 and 2, main control rooms meet GDC 19, "Control Room," as applicable for this review.

2.2 <u>Description of Proposed Changes</u>

Watts Bar, Units 1 and 2, TS 3.6.15, "Shield Building," limiting condition for operation (LCO) requires the shield building to be operable during Modes 1, 2, 3, and 4. Surveillance Requirement 3.6.15.4 is conducted, in part, to demonstrate shield building boundary integrity and, thus, operability.

Watts Bar, Units 1 and 2, SR 3.6.15.4 currently states:

Verify each Emergency Gas Treatment System train with final flow \ge 3600 cfm and \le 4400 cfm produces an annulus pressure equal to or more negative than -0.61 inch water gauge at elevation 783 with respect to the atmosphere and with an inleakage of \le 250 cfm.

The licensee proposed to revise Watts Bar, Units 1 and 2, SR 3.6.15.4 as follows:

Verify the Shield Building can be maintained at an annulus pressure equal to or more negative than -0.63 inch water gauge at elevation 783 with respect to the atmosphere by one Emergency Gas Treatment System train with final flow \geq 3600 and \leq 4400 cfm within 20 seconds after a start signal.

The licensee proposed modifications to SR 3.6.15.4 to align with the format and content of Standard TS (STS) SR 3.6.8.4. In making this change, the focus is shifted from EGTS performance to shield building integrity as is intended per NUREG-1431, Revision 4, "Standard Technical Specifications – Westinghouse Plants," Volume 1, Specifications (ADAMS Accession No. ML12100A222), and NUREG-1431, Revision 4, "Standard Technical Specifications – Westinghouse Plants," Volume 2, Bases (ADAMS Accession No. ML12100A228). Additionally, the change corrects an error in the target annulus pressure by revising the annulus pressure requirement, replacing the inleakage requirement with a time requirement, and deleting the shield building inleakage requirement within which the EGTS must meet the final flow criterion.

2.3 Applicable Regulatory Requirements and Guidance

The NRC staff used the following regulations and regulatory guidance during its review of the LAR:

Under 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," whenever a holder of a license wishes to amend the license, including TSs in the license, an application for amendment must be filed, fully describing the changes desired. Under 10 CFR 50.92(a), determinations on whether to grant an applied-for license amendment are to be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Both the common standards for licenses in 10 CFR 50.40(a), and those specifically for issuance of operating licenses in 10 CFR 50.57(a)(3), provide that there must be reasonable assurance that the activities at issue will not endanger the health and safety of the public, and that the applicant will comply with the Commission's regulations.

Section 50.36, "Technical specifications," of 10 CFR establishes the regulatory requirements related to the content of TSs. Section 50.36(a)(1) requires an application for an operating license to include proposed TSs. 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.

Section 50.36(c)(2) of 10 CFR states that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility, and when an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

Section 50.36(c)(3) of 10 CFR states that SRs 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 LCOs will be met.

Appendix A, "General Design Criteria (GDC) for Nuclear Power Plants," to 10 CFR Part 50 establishes the minimum requirements for the principal design criteria for water-cooled nuclear power plants. The following GDC is applicable for this review:

GDC 19, "Control Room," requires, in part, that a control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in safe condition under accident conditions, including a loss-of-coolant accident. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of five rem whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and control to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

Section 100.11, "Determination of exclusion area, low population zone, and population center distance," of 10 CFR establishes, in part, acceptance criteria for evaluating radiological accident consequences.

NUREG-1431, Revision 4, Volumes 1 and 2, "Standard Technical Specifications – Westinghouse Plants," describe an acceptable way for licensees to satisfy the requirements contained in 10 CFR 50.36.

Branch Technical Position 6-3, Revision 3, "Determination of Bypass Leakage Paths in Dual Containment Plants" (ADAMS Accession No. ML070740004), provides guidance that defines a positive pressure with regard to secondary containment structures as any pressure greater than -0.25 inches (in.) water gauge (w.g.) to account for wind loads and the uncertainty in pressure measurements.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's LAR to determine if the proposed changes are consistent with the guidance, regulations, and plant-specific design and licensing basis information discussed in Section 2.3 of this safety evaluation.

3.1 <u>Revision of Shield Building Annulus Pressure Requirement</u>

The proposed change to Watts Bar, Units 1 and 2, SR 3.6.15.4 resolves a non-conservatism with respect to the Watts Bar LOCA analysis. The licensee determined that the current SR 3.6.15.4 shield building annulus pressure criterion of -0.61 in. w.g. was found to be in error and proposed a revised value of -0.63 in. w.g.

The Watts Bar, Units 1 and 2, shield building pressure sensors are located at an elevation of 783 feet, while the upper elevation of the shield building is 879.04 feet. The differential pressure caused by stack effect inside of the shield building must also be considered based on the instrument elevation. The licensee determined that a measured value of -0.63 in. w.g. at the elevation of the pressure sensors will ensure that the pressure at any elevation in the annulus will be equal to or more negative than -0.25 in. w.g.

The licensee determined that the proposed change will further align SR 3.6.15.4 with STS SR 3.6.8.4. In making this change to SR 3.6.15.4, the focus is shifted from EGTS train performance to shield building integrity. Additionally, the licensee is correcting an error in the target annulus pressure, removing the reference to an inleakage value, and adding a time component within which the EGTS must meet the final flow criteria.

As described in the Bases to STS SR 3.6.8.4, the primary purpose of this SR is to ensure shield building integrity. The secondary purpose of this SR is to ensure that the EGTS is being tested to function as designed. Per the STS Bases for SR 3.6.8.4, the air cleanup system for the shield building produces a negative pressure to prevent leakage from the building. Additionally, SR 3.6.8.4 verifies that the shield building can be rapidly drawn down to a specified pressure in the annulus in a specified time using one train of the air cleanup system for the shield building. The operability of the air cleanup system for the shield building limits radioactive leakage from the shield building to those paths and leakage rates assumed in the accident analyses.

By letter dated December 6, 2019 (ADAMS Accession No. ML19340B773), the licensee explained an error in the determination of the required annulus pressure value. To account for pressure instrument uncertainty and pressure changes resulting from wind loading as described in Branch Technical Position 6-3, and temperature induced differential pressure effects as described in Information Notice 88-76, "Recent Discovery of a Phenomenon not Previously Considered in the Design of Secondary Containment Pressure Control," (ADAMS Accession No. ML031150101), the licensee recalculated the prescribed annulus pressure to a value of -0.63 in. w.g. The staff found this annulus pressure value acceptable in its approval (ADAMS Accession No. ML20245E413) of the licensing action associated with the December 6, 2019, letter.

As described in Chapter 6 of the Watts Bar's UFSAR, leakage from the containment to the annulus is controlled by component design and evaluated by periodic leakage tests. Additionally, per SR 3.6.15.1, the licensee periodically verifies annulus pressure is equal to, or more negative than -1 in. w.g. with respect to the atmosphere. This ensures that annulus pressure is within the parameters assumed for proper EGTS operation and other applicable analyses.

In Section 3.2.1 of the December 6, 2019 letter, the licensee provided parameters used in its LOCA radiological consequences analysis, including certain postulated failures of the EGTS and the resultant impacts on system flowrates in a tabulated, time-based manner. Specifically,

the acceptance criteria for radiological accident consequence analyses are divided into doses impacting the public at the exclusion area boundary and low population zone, as defined in 10 CFR 100.11, and those impacting the operators in the control room, as defined in the GDC 19. For both Watts Bar units, the current LOCA analysis continues to meet the applicable acceptance criteria because the proposed annulus pressure of -0.63 in. w.g. remains bounded by the assumption of the shield building annulus being at atmospheric pressure at the initiation of the postulated LOCA. Therefore, Watts Bar, Units 1 and 2, will continue to comply with the requirements of 10 CFR 100.11, and will continue to meet the criteria of GDC 19. As a result, the NRC staff finds that the proposed change to the SR 3.6.15.4 shield building annulus pressure requirement to -0.63 in. w.g. continues to satisfy the requirement of 10 CFR 50.36(c)(3) and is, therefore, acceptable.

3.2 <u>Replacement of Shield Building Inleakage Requirement with an EGTS Time</u> <u>Requirement and Deletion of the Shield Building Inleakage Requirement</u>

The ability of an EGTS train with a final flowrate of \geq 3600 cfm and \leq 4400 cfm to produce the required negative pressure provides assurance that the building is adequately sealed. The negative pressure prevents leakage from the shield building and minimizes any radiation leakage during accident conditions.

The EGTS final flowrate requirements are verified with SR 3.6.9.4, and the ability to maintain required annulus pressure is verified by SR 3.6.15.4. The current SR to test the annulus pressure requires testing with an inleakage of ≤ 250 cfm. The proposed change retains the EGTS flow requirement, but revises the annulus pressure requirement, replaces the inleakage requirement with a time requirement, and deletes the inleakage requirement of ≤ 250 cfm from the current SR 3.6.15.4.

The SR negative pressure annulus requirement is met with the Watts Bar EGTS train with a final flowrate of \geq 3600 and \leq 4400 cfm. The purpose for the 250 cfm inleakage requirement is discussed in Watts Bar's UFSAR Section 6.2.3.2.1 that describes the total expected infiltration rate across all leakage paths into the annulus is 250 cfm at the post accident conditions with a postulated single failure of one EGTS train. The inleakage has been incorporated into the accident analysis and the 250 cfm value is discussed in Section 15.5.3 of the Watts Bar's UFSAR regarding the effectiveness of the double containment design. Section 15 of Watts Bar's UFSAR indicates that the accident analysis assumes a shield building inleakage of 250 cfm exists throughout the 30-day period for the single failure scenario regarding loss of one EGTS train concurrent with a LOCA. With the \leq 250 cfm requirement deleted from TS, the licensee plans to retain the inleakage requirement in its applicable design output documents supporting the safety analysis and the surveillance instructions for SR 3.6.15.4. The surveillance requirement of EGTS capability is maintained at an annulus pressure equal to or more negative than -0.63 in. w.g. at elevation 783 feet with respect to the atmosphere and will account for the ability to withstand inleakage.

Section 2.1 of the LAR noted that the Watts Bar LOCA analysis assumes that the EGTS maintains the shield building at -1.45 in. w.g. with an inleakage of 250 cfm. Section 2.1 also noted that operability of the shield building has and will be maintained based on the last 3 years of SR 3.6.15.4 performances showing that inleakage had not exceeded 250 cfm when corrected to -1.45 in. w.g.

The licensee proposed to incorporate a time criterion requiring an EGTS train to maintain the annulus pressure equal to or more negative than the -0.63 in. w.g. within 20 seconds from the

initiation after a start signal. The time limit ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. The EGTS final flowrate and time constraint of 20 seconds requirements are verified with SR 3.6.9.4 and the ability to maintain required annulus pressure is verified by SR 3.6.15.4.

Section 3.2.1 of the LAR noted that the proposed time requirement for the EGTS of 20 seconds after a start signal ensures that the shield building can be rapidly drawn down to a negative pressure at all elevations in the shield building and ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. The LAR further indicates that this 20 second value is not directly used in the safety analysis but is used to demonstrate that the integrity of the shield building is maintained. In the proposed TS bases changes for 3.6.15.4, the licensee notes that upon failure to meet this SR, the leak-tightness of the shield building must be immediately assessed to determine the impact on the operability of the shield building.

The licensee also noted that SR 3.6.8.4 of NUREG-1431, Revision 4, contains a time criterion that states:

Verify the shield building can be maintained at a pressure equal to or more negative than [-0.5] inch water gauge in the annulus by one Shield Building Air Cleanup System train with final flow \leq [] cfm within [22] seconds after a start signal.

This STS SR is described, in part, in the Bases as the time limit to ensure that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure.

The proposed SR 3.6.15.4 is consistent with SR 3.6.9.4 for TS 3.6.9, "Emergency Gas Treatment System," that requires the same time limit of 20 seconds after an initiation signal for the EGTS to establish the appropriate flow. The SR demonstrates that the appropriate flow rate can be reached, and that the EGTS can establish a negative pressure in the annulus and properly filter and adsorb radioactive materials that leak from the containment into the shield building annulus prior to exhausting to the environment.

In Section 3.2.1 of the December 6, 2019, letter, the licensee provided parameters used in its LOCA radiological consequences analysis, including certain postulated failures of the EGTS and the resultant impacts on system flowrates in a tabulated, time-based manner. Specifically, the acceptance criteria for radiological accident consequence analyses are divided into doses impacting the public at the exclusion area boundary and low population zone, as defined in 10 CFR 100.11, and those impacting the operators in the control room, as defined in the GDC 19. For both Watts Bar units, the current licensing basis LOCA analysis continues to meet the applicable acceptance criteria because the proposed replacement of the shield building inleakage requirement with an EGTS time requirement and deletion of the shield building inleakage requirement ensures that the shield building can be rapidly drawn down to a negative pressure and ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. Therefore, the change does not impact the containment and EGTS ability to perform the safety function of minimizing radiation release to the environment, and Watts Bar, Units 1 and 2, will continue to comply with the requirements of 10 CFR 100.11, and will continue to meet the criteria of GDC 19. As a result, the NRC staff finds that the proposed change to SR 3.6.15.4 to replace the inleakage requirement of \leq 250 cfm with a time requirement of 20 seconds from the initiation after a start signal, and

deletion of the inleakage requirement continues to satisfy the requirement of 10 CFR 50.36(c)(3) and is, therefore, acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment on July 26, 2021. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to installation or use of a facility's components located within the restricted area as defined in 10 CFR Part 20 and changes a surveillance requirement. The NRC staff has determined that the amendments involve 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 previously issued a proposed finding that the amendment involves no significant hazards consideration published in the *Federal Register* on February 23, 2021 (86 FR 11009), and there has been no public comment on such finding. Accordingly, the amendments meet 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 amendments.

6.0 <u>CONCLUSION</u>

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: December 16, 2021

SUBJECT: WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 150 AND 58 REGARDING MODIFICATION OF TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 3.6.15.4 (EPID L-2021-LLA-0270) DATED DECEMBER 16, 2021

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