



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

January 14, 2014

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3D-C
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT TO
TECHNICAL SPECIFICATION 3.7.10 FOR CONTROL ROOM EMERGENCY
VENTILATION SYSTEMS (TAC NO. MF0312)**

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 94 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant (WBN), Unit 1. This amendment consists of changes to the license and the Technical Specifications (TSs) in response to your application dated November 19, 2012, as supplemented by letter dated September 13, 2013.

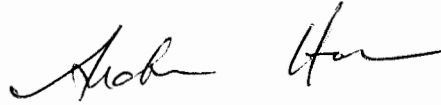
The proposed amendment will change the WBN Unit 1 TS 3.7.10 to require a unit shutdown within the TS 3.7.10 Actions instead of entering Limiting Condition for Operation 3.0.3. This is applicable when both Control Room Emergency Ventilation System (CREVS) trains are inoperable in MODEs 1, 2, 3, or 4 due to actions taken as a result of a tornado warning and the Completion Time of 8 hours for restoration of at least one CREVS train to OPERABLE status is not met.

J. Shea

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A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Hon", written in a cursive style.

Andrew Hon, 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. 94 to NPF-90
2. Safety Evaluation

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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. 94
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (the licensee) dated November 19, 2012, as supplemented by letter dated September 13, 2013, 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 Title 10 of the *Code of Federal Regulations* (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.

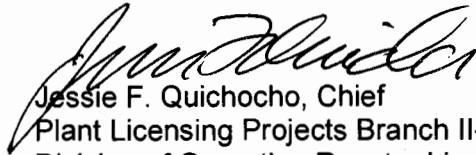
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A as revised through Amendment No. 94 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 no later than 60 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Jessie F. Quichocho, Chief
Plant Licensing Projects Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License
and the Technical Specifications

Date of Issuance: January 14, 2014

ATTACHMENT TO LICENSE AMENDMENT NO. 94

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace Page 3 of Operating License NPF-90 with the attached Page 3.

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 a marginal line indicating the area of change.

REMOVE

3.7-23
3.7-24

INSERT

3.7-23
3.7-24

- (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. 94 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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Place OPERABLE CREVS train in emergency mode.	Immediately
	<u>OR</u> D.2 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREVS trains inoperable in MODE 1, 2, 3, or 4 due to actions taken as a result of a tornado warning.	E.1 Restore one CREVS train to OPERABLE status.	8 hours
F. Required Action and associated Completion Time of Condition E not met.	F.1 Be in MODE 3.	6 hours
	<u>AND</u> F.2 Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>G. Two CREVS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.</p> <p><u>OR</u></p> <p>One or more CREVS trains inoperable due to inoperable CRE boundary in Mode 5 or 6, or during movement of irradiated fuel assemblies.</p>	G.1 Suspend movement of irradiated fuel assemblies.	Immediately
H. Two CREVS trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B or E.	H.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.10.1 Operate each CREVS train for ≥ 15 minutes.	31 days
SR 3.7.10.2 Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3 Verify each CREVS train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.10.4 Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Habitability Program.	In accordance with the Control Room Envelope Habitability Program



UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 94 TO FACILITY OPERATING LICENSE NO. NPF-90
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 1
DOCKET NO. 50-390

1.0 INTRODUCTION

By application dated November 19, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12333A240), as supplemented by a letter dated September 13, 2013 (ADAMS Accession No. ML13261A150), Tennessee Valley Authority (the licensee) requested a license amendment for the Watts Bar Nuclear Plant (WBN) Unit 1, Facility Operating License No. NPF-90. The proposed amendment will change the WBN Unit 1 Technical Specification (TS) 3.7.10 to require a unit shutdown within the TS 3.7.10 Actions instead of entering Limiting Condition for Operation 3.0.3. This is applicable when both Control Room Emergency Ventilation System (CREVS) trains are inoperable in MODEs 1, 2, 3, or 4 due to actions taken as a result of a tornado warning and the Completion Time of 8 hours for restoration of at least one CREVS train to OPERABLE status is not met.

The supplement dated September 13, 2013, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on March 19, 2013 (78 FR16885).

2.0 REGULATORY EVALUATION

The control room is the plant area, defined in the facility licensing basis, from which actions are taken to operate the plant safely under normal conditions and to maintain the reactor in a safe condition during accident situations. The control room envelope (CRE) is the plant area, defined in the facility licensing basis, which encompasses the control room and may encompass other plant areas. The structures that make up the CRE are designed to limit the inleakage of airborne radioactivity and hazardous materials from areas external to the CRE. Control room habitability systems (CRHSs) typically provide the functions of shielding, isolation, pressurization, heating, ventilation, air conditioning and filtration, monitoring, and the sustenance and sanitation necessary to ensure that the control room operators can remain in the control room and take actions to operate the plant under normal and accident conditions. The personnel protection features incorporated into the design of a particular plant's CRHSs depend on the nature and scope of the plant-specific challenges to maintaining control room habitability. In the majority of the CRHS designs, isolation of the normal supply and exhaust

flow paths and pressurization of the CRE relative to adjacent areas are fundamental to ensuring a habitable control room.

During the design of a nuclear power plant, licensees perform analyses to demonstrate that the CRHSs, as designed, provide a habitable environment during postulated design basis events. These design analyses model the transport of potential contaminants into the CRE and their removal. The amount of inleakage of assumed contaminants is important to these analyses. Unaccounted-for contaminants entering the CRE may impact the ability of the operators to perform plant control functions. If contaminants impair the response of the operators to an accident, there could be increased consequences to the public health and safety.

The NRC staff considered the following applicable regulatory requirement and guidance documents for the review of the proposed license amendment request:

- 2.1 Title 10, *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, General Design Criterion (GDC) 19, "Control room," which states in part, that: "...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 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident...."

The acceptance criterion to establish compliance with GDC 19 for facilities licensed with an accident source term is the 5 rem total effective dose equivalent (TEDE) criterion of 10 CFR 50.67(b)(2)(iii).

- 2.2 GDC 4, "Environmental and dynamic effects design bases," insofar as it requires that Structures, systems, and components (SSCs) important to safety be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents and that such SSCs be appropriately protected against dynamic effects.
- 2.3 NUREG-0800 Rev. 3, Standard Review Plan for the review of Safety Analysis Reports for Nuclear Power Plant: LWR Edition, Section 6.4, "Control Room Habitability System," and Section 9.4.1 "Control Room Area Ventilation System."
- 2.4 NUREG-1431, Revision 4, Volume 1, "Standard Technical Specifications – Westinghouse Plants," TS 3.7.10 "Control Room Emergency Filtration System (CREFS)" for isolation dampers.
- 2.5 NUREG-0847, Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2.
- 2.6 Regulatory Guide (RG) 1.196 Rev. 1, "Control Room Habitability at Light-Water Nuclear Power Reactors."
- 2.7 Section 50.36 of 10 CFR, "Technical specifications." This regulation requires that the TSs include items in the following categories: (1) *Safety limits, limiting safety system*

settings, and limiting control settings, (2) Limiting conditions for operation, (3) Surveillance requirements, (4) Design features, and (5) Administrative controls.

In addition, the licensee identified and the staff reviewed the following precedent to support its position that the NRC should approve the amendment request:

Sequoyah Nuclear Plant Units 1 and 2, License Amendments 187 and 179, dated October 17, 1994 (ADAMS Accession No. ML013310385).

3.0 TECHNICAL EVALUATION

3.1 TS 3.7.10 Change

WBN Unit 1 TS 3.7.10 requires two independent CREVS trains to be OPERABLE in all MODES and during movement of irradiated fuel assemblies. TS 3.7.10 Action Condition E describes the Required Actions and Completion Time when two CREVS trains are inoperable in MODEs 1, 2, 3, or 4 due to actions taken as a result of a tornado warning. Required Action E.1 requires restoration of one CREVS train to OPERABLE status with a Completion Time of 8 hours. However, there is no specific Required Action and Completion Time if Required Action E.1 and associated Completion Time is not met. In order to clarify the Required Action for not meeting Required Action E.1 and associated Completion Time, the licensee proposes to revise TS 3.7.10 to add a new Condition F to state:

F. Required Action and associated Completion Time of Condition E not met.

The proposed Required Actions and Completion Times for the new Condition F state:

F.1 Be in MODE 3. 6 hours

AND

F.2 Be in MODE 5. 36 hours

The licensee states that as a result of this change, the following conforming changes to TS 3.7.10 Actions are required:

Current Condition F is changed to Condition G and current Required Action F.1 is changed to Required Action G.1.

Current Condition G is changed to Condition H and current Required Action G.1 is changed to Required Action H.1.

The licensee provided justification for the proposed change in Section 3.2 on page 4 and 5 of the license amendment request by stating:

The proposed change adds a specific requirement for a unit shutdown within the TS 3.7.10 Actions instead of entering LCO 3.0.3 when both

CREVS trains are inoperable in MODE 1, 2, 3, or 4 due to actions taken as a result of a tornado warning and the Completion Time of 8 hours for restoration of at least one CREVS train to OPERABLE status is not met. The proposed new Action F would apply in this situation, and proposed Required Actions F.1 and F.2 would require the unit to be in MODE 3 within a Completion Time of 6 hours, and in MODE 5 within a Completion Time of 36 hours, respectively. This proposed new Action F provides a similar requirement as the current LCO 3.0.3 Action, in that the unit will be required to be placed in a subcritical condition (MODE 3) within a finite time and in cold shutdown (MODE 5) within a finite time. The proposed new Action F does not include the additional time (1 hour) allowed by LCO 3.0.3 to be in the respective MODES, thus decreasing the Completion Times to be in MODE 3 and MODE 5 by 1 hour. In addition, the proposed new Action F does not include the intermediate action to be in MODE 4 (i.e., less than 350 degrees F). This allowance (to include a specific shutdown action within TS 3.7.10) is consistent with TS 3.7.10 Action C that applies when the Required Actions of Condition B (which also could impact both CREVS trains) are not met within the associated Completion Time. The change is acceptable because the requirements to shutdown the unit to Mode 3 and Mode 5 are similar to the current requirements (with the exception of the intermediate Required Action and Completion Time to be in MODE 4), and the required Completion Times are 1 hour less than the existing LCO 3.0.3 Completion Times that currently apply. Deletion of the intermediate action is acceptable since placing the unit in MODE 3 ensures the reactor is subcritical, and the requirement to be in MODE 5 will ensure the unit is cooled down to 200 degrees F.

The staff considered the licensee's justification and determined that while new Condition F contains no specified time to reach MODE 4, the proposed change is, overall, a more restrictive change to TS requirements because of the reduced time to reach MODE 5 compared to LCO 3.0.3 requirements. The staff also determined that the proposed TS changes will continue to provide adequate assurance of protection of public health and safety. Therefore, the staff determined that the proposed changes were acceptable and met the requirements of 10 CFR 50.57.

3.2 Control Room Area Ventilation System

The staff's review determined that there are no changes to the Control Room Area Ventilation System described in Section 9.4.1 of the WBN Unit 1 Final Safety Analysis Report (FSAR).

The emergency air cleanup system automatically operates upon a safety injection signal, indication of high radiation, or smoke concentrations in the building fresh air supply. Also, during non-tornado operation, power is removed from tornado isolation dampers, which are located in the ductwork connected to the two fresh air intakes. The dampers' control circuits remain de-energized during all plant conditions except tornado warnings, to preclude the possibility of a single failure in their control circuit isolating both air intakes. The control circuits

provide protection against the effects of the tornado depressurization, when needed and, thus, protecting the safety-related equipment of the control room area ventilation system. Thus, the environmental requirements of GDC 4 are met.

To affirm control room personnel protection would not be adversely affected by the proposed change, the NRC staff issued a request for additional information (RAI). The NRC staff reviewed the licensee's supplemental clarifying information contained in the RAI response letter dated September 13, 2013, and found it acceptable because the control room area ventilation system continues to meet the intent of NUREG-0800, "Standard Review Plan," Section 9.4.1, "Control Room Area Ventilation System," and therefore, it continues to meet the requirements of GDC 4, and 19 of 10 CFR Part 50, Appendix A.

Based on the above, and prior staff's evaluation documented in NUREG-0847 and its Supplements, and the staff's evaluation of the information provided by the licensee's letters dated November 19, 2012, and September 13, 2013, the staff concludes that the control room area ventilation system as described in this LAR and supplement will continue to meet the relevant requirements of GDC 4 and 19 of 10 CFR Part 50, Appendix A, with respect to protection against natural phenomena, environmental effects, adequate access and occupancy of the control room under accident conditions and control of release of gaseous radioactive effluents to the environment and will continue to meet the guidelines of RG 1.196 and are, therefore, acceptable.

3.3 Control Room Habitability

The staff's review determined that there are no substantive changes to the Habitability Systems described in Section 6.4 of the WBN Unit 1 FSAR.

During tornadoes, the essential components of the system remain functional because the components are located in a Seismic Category I structure that is designed to resist damage by tornado missiles. For mitigation of potential rapid atmosphere negative pressure transient due to a tornado the intake and exhaust dampers are closed, this protects the ductwork and filter housings from potential damage due to negative pressure.

The staff reviewed the licensee's supplemental clarifying information contained in its RAI response letter dated September 13, 2013, and finds it acceptable because the CREVS will continue to meet the intent of NUREG-0800, "Standard Review Plan," Section 6.4, "Control Room Habitability System," and therefore, it continues to meet the requirements of GDC 4 and 19 of 10 CFR Part 50, Appendix A.

Based on the above and the staff's evaluation of the information provided by the letters dated November 19, 2012, and September 13, 2013, the staff concludes that the control room habitability systems will continue to meet the relevant requirements of GDC 4, and 19 of 10 CFR Part 50, Appendix A and the guidance of RG 1.196 and are, therefore, acceptable.

3.3 SUMMARY

As described above, the NRC staff reviewed the assumptions, inputs, and methods used by the licensee to assess the impact of the proposed license amendment request. The NRC staff finds with reasonable assurance that the proposed changes satisfy the relevant regulatory requirements (e.g., 10 CFR 50.67, GDC) and are consistent with the guidance in RG 1.196 and Standard Review Plan Section 6.4, "Control Room Habitability System," and Section 9.4.1 "Control Room Area Ventilation System."

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 has been no public comment on such finding (78 FR 16885). 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.

6.0 CONCLUSION

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

Contributors: Matthew E. Hamm
John G. Parillo
Roberto L. Torres

Date: January 14, 2014

J. Shea

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A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

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

Docket No. 50-390

Enclosures:

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2. Safety Evaluation

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