



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

December 23, 2015

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

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 – ISSUANCE OF AMENDMENT
REGARDING FIRE PROTECTION LICENSE CONDITIONS (CAC NO. MF6609)

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 105 to Facility Operating License No. NPF-90 for the Watts Bar Nuclear Plant, Unit 1. This amendment consists of changes to the license in response to your application dated August 13, 2015, as supplemented by letter dated August 27, 2015.

The amendment modifies a license condition and adds a new license condition related to fire protection to reflect the revised dual-unit Fire Protection Program in effect following the issuance of the Watts Bar Nuclear Plant, Unit 2, Operating License.

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

If you have any questions, please contact me at 301-415-6020 or Robert.Schaaf@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert G. Schaaf".

Robert G. Schaaf, Senior 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. 105 to NPF-90
2. Safety Evaluation

cc w/enclosures: Distribution via 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. 105
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Tennessee Valley Authority (TVA or the licensee) dated August 13, 2015, as supplemented by letter dated August 27, 2015, 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, Facility Operating License No. NPF-90 is amended as indicated in the attachment to this license amendment.
3. This license amendment is effective as of the date of its issuance, and shall be implemented prior to Watts Bar Nuclear Plant, Unit 2, entry into Mode 4, "Hot Shutdown."

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, reading "Benjamin G. Beasley". The signature is fluid and cursive, with a long horizontal stroke at the end.

Benjamin G. Beasley, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License

Date of Issuance: ~~December~~ 23, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 105

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace the following pages of Facility Operating License No. NPF-90 with the attached pages.

The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages

3
4b
5a

Insert Pages

3
4b
5a

- (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. 105 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.

- (10) By May 31, 2018, TVA shall ensure that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

D. The following exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. Therefore, these exemptions are granted pursuant to 10 CFR 50.12.

- (1) Deleted

- F. 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 approved in Appendix FF Section 3.5 of Supplement 18 and Supplement 29 of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

- G. Deleted

- H. The licensee shall have and maintain financial protection of such types and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 105 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 August 13, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15225A344), as supplemented by letter dated August 27, 2015 (ADAMS Accession No. ML15239B225), the Tennessee Valley Authority (TVA, or the licensee) submitted a license amendment request (LAR) for the Watts Bar Nuclear Plant (WBN), Unit 1. The proposed LAR would modify existing license condition 2.F regarding the Fire Protection Program and propose a new license condition 2.C(10) regarding a fire protection requirement for WBN, Unit 1.

Specifically, license condition 2.F would be modified to reflect the revised WBN dual-unit operation Fire Protection Report (FPR) that was made effective upon issuance of the WBN, Unit 2, Operating License. The proposed addition of license condition 2.C(10) will add a requirement to confirm that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose, consistent with a similar license condition imposed on the WBN, Unit 2, Operating License, issued on October 22, 2015 (ADAMS Accession No. ML15301A140).

The supplemental letter dated August 27, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on September 4, 2015 (80 FR 53581).

2.0 REGULATORY EVALUATION

The as-constructed WBN dual-unit FPR was submitted for NRC review by TVA letters dated June 24, August 27, and October 7, 2015 (ADAMS Accession Nos. ML15175A508, ML15239A794, and ML15280A508, respectively) to support completion of the NRC staff's review of the Operating License application for WBN, Unit 2. The FPR describes the measures that are established at WBN to implement a defense-in-depth fire protection program in plant areas important to safety. The objective of these measures is to: (1) prevent fires from starting; (2) detect rapidly, control, and extinguish promptly those fires that do occur; and (3) provide protection for structures, systems, and components important to safety so that a fire that is not

Enclosure 2

promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

In the FPR, TVA stated that, "The purpose of the Fire Protection Report (FPR) is to consolidate a sufficiently detailed summary of the WBN regulatory required Fire Protection Program into a single document and to reflect the design as-constructed at the time of fuel load." The FPR describes the operational phase of the fire protection program for both WBN units. The NRC staff's technical review and approval of the dual-unit FPR was documented in NUREG-0847, "Safety Evaluation Report [SER] Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplement 29 (SSER 29), issued October 2015 (ADAMS Accession No. ML15282A051).

The WBN, Unit 2, Operating License included license conditions regarding (1) implementation of the fire protection program for WBN, Unit 2; and (2) confirmation that the fire detection monitoring panel in the main control room has been determined to meet designated standards or has been found suitable for the specified purpose.

By letter dated August 13, 2015, as supplemented by letter dated August 27, 2015, TVA submitted the proposed LAR for WBN, Unit 1, to (1) update the license condition regarding implementation of the fire protection program for WBN, Unit 1, to reflect the approval of the dual-unit FPR; and (2) to add a condition regarding the fire detection monitoring panel. The proposed changes would modify the WBN, Unit 1, Operating License to make the license conditions related to the dual-unit FPR consistent with the similar conditions contained in the WBN, Unit 2, Operating License.

Currently, WBN, Unit 1, license condition 2.F states:

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 approved in Supplement 18 (except page 80 of Appendix FF), revised page 80 of Appendix FF of Supplement 18 (as revised by Amendment No. 88, and Supplement 19 of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

As proposed by TVA in its August 13, 2015, letter, the amendment proposed to revise license condition 2.F to state:

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 approved in Section 3.5 of Supplement 18 and Supplement XX of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

The NRC staff notes that the relevant SSER 18 [NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2," Supplement 18, October 1995 (ADAMS Accession No. ML070530364)] approval that remains in effect for WBN, Unit 1, under the dual-unit FPR is documented in Section 3.5 of Appendix FF of SSER 18. Also, at the time the proposed change was submitted, the dual-unit FPR was still under NRC staff review. The staff's review and approval of the Watts Bar dual-unit FPR was subsequently documented in SSER 29. Therefore, the license condition has been modified by the NRC staff and is issued in this amendment as follows:

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 approved in Appendix FF Section 3.5 of Supplement 18 and Supplement 29 of the SER (NUREG-0847) subject to the following provision:

TVA may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

The licensee also proposed to add license condition 2.C(10), regarding the fire detection monitoring panel, consistent with the license condition imposed on WBN, Unit 2. The proposed license condition states:

By May 31, 2018, TVA shall report that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.48, "Fire protection," requires that each operating nuclear power plant have a fire protection plan that satisfies General Design Criterion (GDC 3).

As stated, 10 CFR, Part 50, Appendix A, GDC 3, "Fire protection," requires that structures, systems, and components important to safety be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.

Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," defines a standard license condition acceptable to the NRC staff regarding implementation and maintenance of approved fire protection programs.

Regulatory Guide 1.189, Revision 2, "Fire Protection for Nuclear Power Plants," Position 3.1(b) states, in part, that, "Fire detection and alarm systems should comply with the requirements of Class A systems, as defined in [National Fire Protection Association (NFPA) Code] NFPA 72."

NFPA 72, "National Fire Alarm and Signaling Code" (2010 Edition), covers the application, installation, location, performance, inspection, testing and maintenance of fire alarm systems,

supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment and emergency communications systems, and their components.

3.0 TECHNICAL EVALUATION

The staff's review and approval of the Watts Bar dual-unit FPR was documented in SSER 29. The staff review of operator manual actions (OMAs) described in the dual-unit FPR, as documented in Section 3.5 of Appendix FF of SSER 29, was limited to the review of OMAs for WBN, Unit 2. The staff noted in SSER 29 that the WBN, Unit 1, OMAs were previously approved in SSER 18. Specifically, the WBN, Unit 1, OMAs were addressed in Section 3.5 of Appendix FF of SSER 18.

Based on the staff's approval of the dual-unit FPR, as documented in SSER 29, including the staff's determination that the approval of OMAs contained in SSER 18 remains applicable, the staff finds that the proposed change to license condition 2.F accurately describes the approved fire protection program for WBN, Unit 1. The proposed license condition is also consistent with the standard license condition defined in GL 86-10. Therefore, the NRC staff concludes that the proposed amendment to license condition 2.F is acceptable.

The "fire detection monitoring panel," as described in the August 13, 2015, LAR, provides indication of the status of the fire alarm system in the main control room. The original panel was accepted by a listing organization (Underwriters Laboratory), acceptable to the authority having jurisdiction (the NRC) for use in fire protection systems.

In 2014, TVA completed a design change to replace the original, now obsolete, fire detection monitoring panel in the main control room with a new panel procured by TVA's Computer Engineering Group. TVA performed post-modification testing to verify the operability of the system, but the new panel was not accepted by a listing organization. During the review of the WBN dual-unit FPR, documented in SSER 29, the NRC staff raised a question regarding the functionality, safety, and reliability of the non-listed fire detection monitoring panel. The NRC staff considers these elements appropriately assured when the equipment is accepted by a listing organization.

To resolve this issue for WBN, Unit 2, the following license condition was included in the WBN, Unit 2, Operating License:

By May 31, 2018, TVA shall report that a listing organization acceptable to the NRC (as the Authority Having Jurisdiction) determines that the fire detection monitoring panel in the main control room either meets the appropriate designated standards or has been tested and found suitable for the specified purpose.

The licensee proposed in its LAR that a similar license condition be imposed as condition 2.C(10) of the WBN, Unit 1, Operating License.

The current version of NRC staff guidance related to fire alarm systems is contained in Regulatory Guide 1.189, Revision 2, which states that such systems should comply with

NFPA 72. The version of NFPA 72 in effect at the time of the design change was the 2010 Edition. A fundamental aspect of NFPA 72 is that equipment be designed and installed in conformity with its listed purpose. NFPA 72 describes that equipment is listed when an organization acceptable to the authority having jurisdiction has determined that it meets appropriate standards and is suitable for its purpose. The NRC is the authority having jurisdiction in this case.

The NRC staff concludes that the proposed license condition is acceptable because the completion of the action will confirm that WBN's fire detection monitoring panel is in conformance with the current NRC guidance regarding fire alarm systems as described in Regulatory Guide 1.189, Revision 2, Position 3.1(b), and NFPA 72. The staff concludes that the proposed schedule for completing the actions is reasonable, because it provides sufficient time to permit confirmation that the installed equipment is appropriate, and provides sufficient time to address any non-panel-related detection equipment (for example detectors or other system components in the plant) that would need to be replaced to attain conformance.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment. 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 (80 FR 53581, September 4, 2015). 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, 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Charles E. Moulton
Robert G. Schaaf

Date: December 23, 2015

December 23, 2015

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

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT
REGARDING FIRE PROTECTION LICENSE CONDITIONS (CAC NO. MF6609)

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If you have any questions, please contact me at 301-415-6020 or Robert.Schaaf@nrc.gov.

Sincerely,
/RA/

Robert G. Schaaf, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-390

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