



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

May 29, 2018

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

**SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3; SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2; WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 – CORRECTION TO AN OMITTED REFERENCE FOR LICENSE AMENDMENTS REGARDING REQUEST TO UPGRADE EMERGENCY ACTION LEVEL SCHEME (CAC NOS. MF9054, MF9055, MF9056, MF9057, MF9058, MF9059, AND MF9060; EPID L-2017-LLA-0160)**

Dear Mr. Shea:

On December 22, 2018, the Nuclear Regulatory Commission (NRC) issued the enclosed amendments:

1. Amendment Nos. 303, 327, and 287 to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant, Units 1, 2, and 3, respectively.
2. Amendment Nos. 339 and 332 to Renewed Facility Operating License Nos. DPR-77 and DPR-79 for Sequoyah Nuclear Plant, Units 1 and 2, respectively.
3. Amendment Nos. 118 and 18 to Facility Operating License Nos. NPF-90 and NPF-96 for the Watts Bar Nuclear Plant, Units 1 and 2, respectively.

These amendments were in response to the subject request dated January 4, 2017, as supplemented by letters dated July 7 and July 27, 2017. These amendments changed Tennessee Valley Authority's emergency action level schemes to one based on the Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 21, 2012. The request also provided an explanation of any difference or deviation from NEI 99-01, Revision 6.

After issuance of the amendments, the NRC staff was informed that the date of July 27, 2017 supplement and corresponding reference (Reference 13) were inadvertently omitted from our Safety Evaluations. Please replace the incorrect pages with the corrected Safety Evaluation pages enclosed with this letter. This did not change our conclusions and bases.

J. Shea

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A corrected Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

If you have any questions regarding this matter, please contact me at (301) 415-8480.

Sincerely,

A handwritten signature in black ink, appearing to read 'Andrew Hon', with a long horizontal stroke extending to the right.

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

Docket Nos. 50-259, 50-260, 50-296,  
72-052, 50-327, 50-328,  
72-034, 50-390, 50-391  
and 72-1048

Enclosures:

1. Browns Ferry Corrected SE Pages
2. Sequoyah Corrected SE Pages
3. Watts Bar Corrected SE Pages 10

cc: Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 303, 327, AND 287

TO RENEWED FACILITY LICENSE NUMBERS, DPR-33, DPR-52, AND DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

DOCKET NUMBERS 50-259, 50-260, 50-296, AND 72-052

1.0 INTRODUCTION

By application dated January 4, 2017 (Reference 1), as supplemented by letters dated July 7 and July 27, 2017 (References 2 and 13), the Tennessee Valley Authority (TVA or the licensee) requested U.S. Nuclear Regulatory Commission (NRC or the Commission) approval of changes to the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 Emergency Plan. The proposed amendments would revise the emergency action level (EAL) scheme to one based on the Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 3). Revision 6 of NEI 99-01 was endorsed by the NRC in a letter dated March 28, 2013 (Reference 4).

The supplemental letters dated July 7 and July 27, 2017, provided additional information that clarified the application, did not expand the scope of the application as originally noticed and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on June 19, 2017 (82 FR 27891).

2.0 REGULATORY EVALUATION

The applicable regulations and guidance for the emergency plans are provided in Sections 2.1 and 2.2 as follows:

2.1 Regulations

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.47, "Emergency plans," sets forth emergency plan requirements for nuclear power plant facilities. The regulations in 10 CFR 50.47(a)(1)(i) state, in part, that:

. . . no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

### 3.7 Review Summary

The NRC staff has reviewed the technical bases for the proposed EAL scheme, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. The licensee chose to modify its proposed EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format that is better aligned with how it currently implements its EALs, as well as with plant-specific writer's guides and preferences. The NRC staff verified that these modifications do not alter the intent of any specific EAL within a set, recognition category, or within the entire EAL scheme described in NEI 99-01, Revision 6. Thus, the proposed changes meet the requirements in Section IV.B of Appendix E to 10 CFR Part 50 and planning standard 10 CFR 50.47(b)(4).

The NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human factors engineering and user friendliness concerns, follows logical progressions for escalating events, and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger an emergency classification are in the same range of relative risk. In addition, the NRC staff determined that the proposed EAL scheme is technically complete and consistent with EAL schemes implemented at similarly designed plants.

The NRC staff verified that the instrumentation and set points derived for this proposed EAL scheme are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Based on its review, the NRC staff finds that the licensee's proposed EAL scheme is acceptable and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Specifically, the staff concludes that the licensee's proposed EAL scheme and site-specific EAL technical basis document provided by letter dated July 27, 2017, is acceptable for implementation.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendments on October 27, 2017. The State official had no comments.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20, because the amendments approve an acceptable EAL scheme that is required for operation of the facility. 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,

7. U.S. Nuclear Regulatory Commission, "Emergency Planning and Preparedness for Nuclear Power Reactors," Regulatory Guide 1.101, Revision 2, October 31, 1981 (ADAMS Accession No. ML090440294), Revision 3, August 31, 1992 (ADAMS Accession No. ML003740302), and Revision 4, dated July 31, 2003 (ADAMS Accession No. ML032020276).
8. U.S. Nuclear Regulatory Commission, Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (ADAMS Accession No. ML051740058).
9. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary 2006-12, "Endorsement of Nuclear Energy Institute Guidance 'Enhancements to Emergency Preparedness Programs for Hostile Action,'" dated July 19, 2006 (ADAMS Accession No. ML072670421).
10. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary 2003-18, "Use of NEI-99-01, 'Methodology for Development of Emergency Action Levels,' Revision 4, dated January 2003," dated October 8, 2003, including Supplement 1 dated July 13, 2004, and Supplement 2 dated December 12, 2005 (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482, respectively).
11. U.S. Environmental Protection Agency PAG Manual, "Protective Action Guides and Planning Guidance for Radiological Incidents," dated January 2017 (ADAMS Accession No. ML17044A073).
12. Leeds, E. and Johnson, M., U.S. Nuclear Regulatory Commission, letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Effective Immediately)," dated March 12, 2012 (ADAMS Accession No. ML12056A044).
13. Letter from Tennessee Valley Authority, to U.S. Nuclear Regulatory Commission, "Browns Ferry, Sequoyah, and Watts Bar - Response to NRC Request for Additional Information Related to TVA Fleet License Amendment Request to Adopt NEI 99-01 Revision 6 Emergency Action Levels," dated July 27, 2017 (ADAMS Accession ML17212A416)

Principal Contributor: R. Hoffman, NSIR/DPR/RLB

Date: December 22, 2017



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 339 AND 332

TO RENEWED FACILITY LICENSE NUMBERS, DPR-77, DPR-79, AND 72-034

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NUMBERS 50-327, 50-328, AND 72-034

1.0 INTRODUCTION

By application dated January 4, 2017 (Reference 1), as supplemented by letters dated July 7 and July 27, 2017 (References 2 and 13), the Tennessee Valley Authority (TVA or the licensee) requested U.S. Nuclear Regulatory Commission (NRC or the Commission) approval of changes to revise the Sequoyah Nuclear Plant (SQN), Units 1, and 2 Emergency Plan. The proposed amendments would revise the emergency action level (EAL) scheme to one based on the Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 3). Revision 6 of NEI 99-01 was endorsed by the NRC in a letter dated March 28, 2013 (Reference 4).

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. . . no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate

The NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human factors engineering and user friendliness concerns, follows logical progressions for escalating events, and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger an emergency classification are in the same range of relative risk. In addition, the NRC staff determined that the proposed EAL scheme is technically complete and consistent with EAL schemes implemented at similarly designed plants.

The NRC staff verified that the instrumentation and set points derived for this proposed EAL scheme are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Based on its review, the NRC staff finds that the licensee's proposed EAL scheme is acceptable and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Specifically, the staff concludes that the licensee's proposed EAL scheme and site-specific EAL technical basis document provided by letter dated July 27, 2017, is acceptable for implementation.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendments on October 27, 2017. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20, because the amendments approve an acceptable EAL scheme that is required for operation of the facility. 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 has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on June 19, 2017 (82 FR 27891). 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 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.

11. U.S. Environmental Protection Agency PAG Manual, "Protective Action Guides and Planning Guidance for Radiological Incidents," dated January 2017 (ADAMS Accession No. ML17044A073).
12. Leeds, E. and Johnson, M., U.S. Nuclear Regulatory Commission, letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Effective Immediately)," dated March 12, 2012 (ADAMS Accession No. ML12056A044).
13. Letter from Tennessee Valley Authority, to U.S. Nuclear Regulatory Commission, "Browns Ferry, Sequoyah, and Watts Bar - Response to NRC Request for Additional Information Related to TVA Fleet License Amendment Request to Adopt NEI 99-01 Revision 6 Emergency Action Levels," dated July 27, 2017 (ADAMS Accession ML17212A416)

Principal Contributor: Raymond Hoffman, NSIR/DPR/RLB

Date: December 22, 2017





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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 118 AND 18

TO FACILITY LICENSE NUMBERS, DPR-90 AND DPR-96

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NUMBERS 50-390, 50-391, AND 72-1043

1.0 INTRODUCTION

By application dated January 4, 2017 (Reference 1), as supplemented by letters dated July 7 and July 27, 2017 (References 2 and 13), the Tennessee Valley Authority (TVA or the licensee) requested U.S. Nuclear Regulatory Commission (NRC or the Commission) approval of changes to revise the Watts Bar Nuclear Plant (WBN), Units 1 and 2 Emergency Plan. The proposed amendments would revise the emergency action level (EAL) scheme to one based on the Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 3). Revision 6 of NEI 99-01 was endorsed by the NRC in a letter dated March 28, 2013 (Reference 4).

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**ADAMS Accession No.: ML18138A452**

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NSIR/DPR/RLB/BC
NAME	AHon	BClayton	JAnderson
DATE	5/24/18	5/24/18	5/29/18
OFFICE	NRR/DORL/LPL2-2/BC(A)	NRR/DORL/LPL2-2/PM	
NAME	BTindell	AHon	
DATE	5/29/18	5/29/18	

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