



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

August 13, 2019

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

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3 – ISSUANCE OF AMENDMENT NOS. 308, 331, AND 291 TO EXTEND IMPLEMENTATION DUE DATE FOR MODIFICATIONS 102 AND 106 RELATED TO NFPA 805, “PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION OF LIGHT WATER REACTOR ELECTRIC GENERATING PLANTS” (EPID L-2019-LLA-0140)

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment Nos. 308, 331, and 291 to Renewed Facility Operating License (RFOL) Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant (Browns Ferry), Units 1, 2, and 3, respectively. These amendments are in response to Tennessee Valley Authority’s license amendment request dated July 3, 2019.

The amendments revise the RFOLs by changing license conditions for Browns Ferry, Units 1, 2, and 3 associated with the fire protection program controlled by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.48(c), “National Fire Protection Association Standard NFPA 805.” The amendments extend the implementation due dates for Modifications 102 and 106 listed in Item 2 under “Transition License Conditions” in each unit’s RFOL to the end of Browns Ferry Unit 1’s Fall 2020 outage, and April 30, 2020, respectively. Accordingly, these amendments revise the RFOLs paragraphs 2.C.(13) of Unit 1, 2.C.(14) of Unit 2, and 2.C.(7) of Unit 3 for Browns Ferry, Units 1, 2, and 3, respectively.

J. Shea

- 2 -

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

Sincerely,

Handwritten signature of Farideh E. Saba in black ink.

Farideh E. Saba, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, and 50-296

Enclosures:

1. Amendment No. 308 to DPR-33
2. Amendment No. 331 to DPR-52
3. Amendment No. 291 to DPR-68
4. Safety Evaluation

cc: Listserv



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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-259

BROWNS FERRY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 308
Renewed License No. DPR-33

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated July 3, 2019, 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 renewed license is amended by changes as indicated in the attachment to this license amendment.
3. The license amendment is effective as of its date of issuance and shall be implemented immediately.

FOR THE NUCLEAR REGULATORY COMMISSION



Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License

Date of Issuance: August 13, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 308

BROWNS FERRY NUCLEAR PLANT, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

Replace the following pages of Renewed Facility Operating License No. DPR-33 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of changes.

REMOVE

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- (3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) 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 or equipment and instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 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 renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 308, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 234 to Facility Operating License DPR-33, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 234. For SRs that existed prior to Amendment 234, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 234.

- (8) Deleted.
- (9) Deleted.
- (10) Deleted/
- (11)(a) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 279, as amended by changes approved by License Amendment No. 286.
- (12) Deleted.
- (13) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated March 27, 2013; June 7, 2017; May 3, 2018, October 18, 2018; and July 3, 2019, as supplemented by letters dated May 16, 2013; December 20, 2013; January 10, 2014; January 14, 2014; February 13, 2014; March 14, 2014; May 30, 2014; June 13, 2014; July 10, 2014; August 29, 2014; September 16, 2014; October 6, 2014; December 17, 2014; March 26, 2015; April 9, 2015; June 19, 2015; August 18, 2015; September 8, 2015; October 20, 2015; September 18, 2017; October 23, 2017; February 13, 2019; and March 8, as approved in the Safety Evaluations dated October 28, 2015; December 19, 2017; October 9, 2018; April 2, 2019; and August 13, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC Safety Evaluation dated October 28, 2015, to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
 2. With the exception of Modifications 102 and 106, the licensee shall implement modifications to its facility, as described in Table S-2, "Plant Modifications Committed," of Tennessee Valley Authority letter CNL-18-100, dated October 18, 2018; as supplemented by letter CNL-19-027, dated February 13, 2019, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the NFPA 805 License Amendment dated October 28, 2015. Modifications 102 and 106 as described in Table S-2, shall be implemented no later than the end of Unit 1's Fall 2020 outage, and April 30, 2020, respectively. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
 3. The licensee shall complete Implementation Items 09, 32, 33, and the second part of Implementation Item 47 as listed in Table S-3, "Implementation Items," of TVA letter CNL-17-130 dated October 23, 2017. Implementation Item 09 shall be completed by June 29, 2018. Implementation Items 32, 33, and the second part of Implementation Item 47, i.e., resolving Finding level Facts and Observations, are associated with modifications and will be completed after all procedure updates, modifications, and training are complete.
- (14) The licensee shall maintain the Augmented Quality Program for the Standby Liquid Control System to provide quality control elements to ensure component reliability for the required alternative source term function defined in the Updated Final Safety Analyses Report (UFSAR).
 - (15) The licensee is required to confirm that the conclusions made in TVA's letter dated September 17, 2004, for the turbine building remain acceptable using seismic demand accelerations based on dynamic seismic analysis prior to the restart of Unit 1.
 - (16) Upon implementation of Amendment No. 275, adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by SR 3.7.3.4, in accordance with TS 5.5.13.c.(i), the assessment of the CRE habitability as required by TS 5.5.13.c.(ii), and the measure of CRE pressure as required by TS 5.5.13.d, shall be considered met.



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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 331
Renewed License No. DPR-52

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated July 3, 2019, 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 renewed license is amended by changes as indicated in the attachment to this license amendment.
3. The license amendment is effective as of its date of issuance and shall be implemented immediately.

FOR THE NUCLEAR REGULATORY COMMISSION



Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License

Date of Issuance: August 13, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 331

BROWNS FERRY NUCLEAR PLANT, UNIT 2

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-52

DOCKET NO. 50-260

Replace the following pages of Renewed Facility Operating License No. DPR-52 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of changes.

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sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

- (4) 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 or equipment and instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 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 renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 331, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 253 to Facility Operating License DPR-52, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 253. For SRs that existed prior to Amendment 253, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 253.

- (3) The licensee is authorized to relocate certain requirements included in Appendix A and the former Appendix B to licensee-controlled documents. Implementation of this amendment shall include the relocation of these requirements to the appropriate documents, as described in the licensee's

- (8) Deleted.
- (9) Deleted.
- (10) Deleted.
- (11)(a) The licensee shall fully implement and maintain in effect all provisions of the commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 306, as amended by changes approved by License Amendment 312.
- (12) Deleted.
- (13) Deleted.
- (14) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated March 27, 2013; June 7, 2017; May 3, 2018, October 18, 2018; and July 3, 2019, as supplemented by letters dated May 16, 2013; December 20, 2013; January 10, 2014; January 14, 2014; February 13, 2014; March 14, 2014; May 30, 2014; June 13, 2014; July 10, 2014; August 29, 2014; September 16, 2014; October 6, 2014; December 17, 2014; March 26, 2015; April 9, 2015; June 19, 2015; August 18, 2015; September 8, 2015; October 20, 2015; September 18, 2017; October 23, 2017; February 13, 2019; and March 8, as approved in the Safety Evaluations dated October 28, 2015; December 19, 2017; October 9, 2018; April 2, 2019; and August 13, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be

- Automatic and Manual Water-Based Fire Suppression Systems (Section 3.9);
- Gaseous Fire Suppression Systems (Section 3.10); and
- Passive Fire Protection Features (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC Safety Evaluation dated October 28, 2015, to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
 2. With the exception of Modifications 102 and 106, the licensee shall implement modifications to its facility, as described in Table S-2, "Plant Modifications Committed," of Tennessee Valley Authority letter CNL-18-100, dated October 18, 2018; as supplemented by letter CNL-19-027, dated February 13, 2019, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the NFPA 805 License Amendment dated October 28, 2015. Modifications 102 and 106 as described in Table S-2, shall be implemented no later than the end of Unit 1's Fall 2020 outage, and April 30, 2020, respectively. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
 3. The licensee shall complete Implementation Items 09, 32, 33, and the second part of Implementation Item 47 as listed in Table S-3, "Implementation Items," of TVA letter CNL-17-130 dated October 23, 2017. Implementation Item 09 shall be completed by June 29, 2018. Implementation Items 32, 33, and the second part of Implementation Item 47, i.e., resolving Finding level Facts and Observations, are associated with modifications and will be completed after all procedure updates, modifications, and training are complete.
- (15) The licensee shall maintain the Augmented Quality Program for the Standby Liquid Control System to provide quality control elements to ensure component reliability for the required alternative source term function defined in the Updated Final Safety Analysis Report (UFSAR).
- (16) Upon complementation of Amendment No. 302, adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by SR 3. 7.3.4, in accordance with TS 5.5.13.c(i), the assessment of the CRE habitability as required by TS 5.5.13.c(ii), and the measure of CRE pressure as required by TS 5.5.13.d, shall be considered met.



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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 291
Renewed License No. DPR-68

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated July 3, 2019, 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 renewed license is amended by changes as indicated in the attachment to this license amendment.
3. The license amendment is effective as of its date of issuance and shall be implemented immediately.

FOR THE NUCLEAR REGULATORY COMMISSION



Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License

Date of Issuance: August 13, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 291
BROWNS FERRY NUCLEAR PLANT, UNIT 3
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-68
DOCKET NO. 50-296

Replace the following pages of Renewed Facility Operating License No. DPR-68 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of changes.

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- (3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (4) 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 or equipment and instrument calibration or associated with radioactive apparatus or components;
 - (5) Pursuant to the Act and 10 CFR Parts 30 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 renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; 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
The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 3952 megawatts thermal.
 - (2) Technical Specifications
The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 291, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 212 to Facility Operating License DPR-68, the first performance is due at the end of the first surveillance interval that begins at implementation of the Amendment 212. For SRs that existed prior to Amendment 212, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the surveillance was last performed prior to implementation of Amendment 212.

- (3) The licensee is authorized to relocate certain requirements included in Appendix A and the former Appendix B to licensee-controlled documents. Implementation of this amendment shall include the relocation of these requirements to the appropriate documents, as described in the licensee's application dated September 6, 1996; as supplemented May 1, August 14, November 5 and 14, December 3, 4, 11, 22, 23, 29, and 30, 1997; January 23, March 12, April 16, 20, and 28, May 7, 14, 19, and 27, and June 2, 5, 10 and 19, 1998; evaluated in the NRC staff's Safety Evaluation enclosed with this amendment. This amendment is effective immediately and shall be implemented within 90 days of the date of this amendment.
- (4) Deleted.
- (5) Classroom and simulator training on all power uprate related changes that affect operator performance will be conducted prior to operating at uprated conditions. Simulator changes that are consistent with power uprate conditions will be made and simulator fidelity will be validated in accordance with ANSI/ANS 3.5-1985. Training and the plant simulator will be modified, as necessary, to incorporate changes identified during startup testing. This amendment is effective immediately.
- (6)(a) The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Browns Ferry Nuclear Plant Physical Security Plan, Training and Qualification Plan, and Contingency Plan," Revision 4, submitted by letter dated April 28, 2006.
- (b) The licensee 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 licensee CSP was approved by License Amendment No. 265, as amended by changes approved by License Amendment Nos. 271 and 281.
- (7) TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated March 27, 2013; June 7, 2017; May 3, 2018, October 18, 2018; and July 3, 2019, as supplemented by letters dated May 16, 2013; December 20, 2013; January 10, 2014; January 14, 2014; February 13, 2014; March 14, 2014; May 30, 2014; June 13, 2014; July 10, 2014; August 29, 2014; September 16, 2014; October 6, 2014; December 17, 2014; March 26, 2015; April 9, 2015; June 19, 2015; August 18, 2015; September 8, 2015; October 20, 2015; September 18, 2017; October 23, 2017; February 13, 2019; and March 8, as approved in the Safety Evaluations dated October 28, 2015; December 19, 2017; October 9, 2018; April 2, 2019; and August 13, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3 elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is adequate for the hazard. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- Fire Alarm and Detection Systems (Section 3.8);
- Automatic and Manual Water-Based Fire Suppression Systems (Section 3.9);
- Gaseous Fire Suppression Systems (Section 3.10); and
- Passive Fire Protection Features (Section 3.11).

This License Condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

2. Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC Safety Evaluation dated October 28, 2015, to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.
2. With the exception of Modifications 102 and 106, the licensee shall implement modifications to its facility, as described in Table S-2, "Plant Modifications Committed," of Tennessee Valley Authority letter CNL-18-100, dated October 18, 2018; as supplemented by letter CNL-19-027, dated February 13, 2019, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the NFPA 805 License Amendment dated October 28, 2015. Modifications 102 and 106 as described in Table S-2, shall be implemented no later than the end of Unit 1's Fall 2020 outage, and April 30, 2020, respectively. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 308
TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33
AMENDMENT NO. 331 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-52
AND
AMENDMENT NO. 291 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-68
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
DOCKET NOS. 50-259, 50-260, AND 50-296

1.0 INTRODUCTION

By letter dated July 3, 2019 (Reference 1), Tennessee Valley Authority (TVA or the licensee), submitted a license amendment request (LAR) regarding the Browns Ferry Nuclear Plant (Browns Ferry or BFN), Units 1, 2, and 3, requesting to extend the implementation due dates for Modifications 102 and 106, which are required to be completed as part of Browns Ferry's implementation of its risk-informed, performance-based, fire protection program (RI/PB FPP) in accordance with paragraph 50.48(c), "National Fire Protection Association Standard 805 NFPA 805," of Title 10 of the *Code of Federal Regulations* (10 CFR). Modifications 102 and 106 are listed in NFPA 805 LAR Attachment S, "Modifications and Implementation Items," Table S-2, "Plant Modifications Committed," in TVA letters dated October 18, 2018 (Reference 2), and February 13, 2019 (Reference 3). The due dates for implementation of these modifications are included in Item 2 under "Transition License Conditions" of License Conditions (LCs) 2.C.(13) for Unit 1, 2.C.(14) for Unit 2, and 2.C.(7) for Unit 3, respectively.

The amendments extend the implementation due dates for Modifications 102 and 106 in Item 2 under "Transition License Conditions" in each unit's RFOL to the end of Browns Ferry Unit 1's Fall 2020 outage, and April 30, 2020, respectively. Accordingly, these amendments revise RFOLs paragraphs 2.C.(13) of Unit 1, 2.C.(14) of Unit 2, and 2.C.(7) of Unit 3 for Browns Ferry.

2.0 REGULATORY EVALUATION

2.1 Program Description

In the 1990s, the U.S. Nuclear Regulatory Commission (NRC or the Commission) worked with the NFPA and industry to develop an RI/PB consensus standard for fire protection. In 2001, the NFPA Standards Council issued NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" (Reference 4), which describes a methodology for establishing fundamental FPP design requirements and elements, determining required fire protection systems and features, applying PB requirements and administering fire protection for existing LWRs during operation, decommissioning, and permanent shutdown. It provides for the establishment of a minimum set of fire protection requirements but allows PB or deterministic approaches to be used to meet performance criteria. By letter dated October 28, 2015 (Reference 5), the NRC staff approved the adoption of NFPA 805 for Browns Ferry.

2.2 Licensee's Proposed Changes

In its LAR dated July 3, 2019, the licensee proposed to modify its NFPA 805 FPP by extending the implementation due dates for Modifications 102 and 106, which are required to be completed per Item 2 under "Transition License Conditions" of LCs 2.C.(13), 2.C.(14), and 2.C.(7) for Browns Ferry, Units 1, 2, and 3, respectively. As described in the LAR, Modification 102 is to modify the actuation circuitry for certain transformer fire protection water spray systems so they are supervised, and Modification 106 is to provide an additional water supply for the cooling tower lift pump bearing lubrication water system so it no longer has to rely on the fire protection water supply under certain conditions.

The licensee is proposing a revision to Item 2 under Transition License Conditions, which currently states:

With the exception of Modifications 102 and 106, the licensee shall implement modifications to its facility, as described in Table S-2, "Plant Modifications Committed," of Tennessee Valley Authority letter CNL-18-100, dated October 18, 2018; as supplemented by letter CNL-19-027, dated February 13, 2019, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the NFPA 805 License Amendment dated October 28, 2015. Modifications 102 and 106 as described in Table S-2, shall be implemented no later than August 14, 2019, and October 14, 2019, respectively. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

The licensee is requesting to revise Item 2 under Transition License Conditions for Browns Ferry, Units 1, 2, and 3, to state (changes shown in bold):

With the exception of Modifications 102 and 106, the licensee shall implement modifications to its facility, as described in Table S-2, "Plant Modifications Committed," of Tennessee Valley Authority letter CNL-18-100, dated October 18, 2018; as supplemented by letter CNL-19-027, dated February 13, 2019, to complete the transition to full compliance with 10 CFR 50.48(c) no later than the end of the second refueling outage (for each unit) following issuance of the NFPA 805 License Amendment dated October 28, 2015. Modifications 102 and

106 as described in Table S-2, shall be implemented no later than **the end of Unit 1's Fall 2020 outage**, and **April 30, 2020**, respectively. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

The change to Item 2 under Transition License Conditions in LCs 2.C.(13), 2.C.(14), and 2.C.(7) necessitates further changes in LCs 2.C.(13), 2.C.(14), and 2.C.(7), which currently state:

TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated March 27, 2013; June 7, 2017; May 3, 2018, and October 18, 2018, as supplemented by letters dated May 16, 2013; December 20, 2013; January 10, 2014; January 14, 2014; February 13, 2014; March 14, 2014; May 30, 2014; June 13, 2014; July 10, 2014; August 29, 2014; September 16, 2014; October 6, 2014; December 17, 2014; March 26, 2015; April 9, 2015; June 19, 2015; August 18, 2015; September 8, 2015; October 20, 2015; September 18, 2017; October 23, 2017; February 13, 2019; and March 8, as approved in the Safety Evaluations dated October 28, 2015; December 19, 2017; October 9, 2018; and April 2, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

The LAR proposes revising LCs 2.C.(13), 2.C.(14), and 2.C.(7) to state (changes shown in bold):

TVA Browns Ferry Nuclear Plant shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment requests dated March 27, 2013; June 7, 2017; May 3, 2018, **and** October 18, 2018; **and July 3, 2019**, as supplemented by letters dated May 16, 2013; December 20, 2013; January 10, 2014; January 14, 2014; February 13, 2014; March 14, 2014; May 30, 2014; June 13, 2014; July 10, 2014; August 29, 2014; September 16, 2014; October 6, 2014; December 17, 2014; March 26, 2015; April 9, 2015; June 19, 2015; August 18, 2015; September 8, 2015; October 20, 2015; September 18, 2017; October 23, 2017; February 13, 2019; and March 8, as approved in the Safety Evaluations dated October 28, 2015; December 19, 2017; October 9, 2018; **and** April 2, 2019; **and August 13, 2019**. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

2.3 Regulatory Requirements

- 10 CFR 50.48, "Fire protection," provides the NRC requirements for nuclear power plant fire protection. The NRC regulations include specific requirements for requesting approval for an RI/PB FPP based on the provisions of NFPA 805.
- Section 50.48(a)(1) of 10 CFR requires that each holder of an operating license has an FPP that satisfies General Design Criterion (GDC) 3, "Fire Protection," of Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants."
- Section 50.48(c) of 10 CFR incorporates NFPA 805 (2001 Edition) by reference, with certain exceptions, modifications, and supplementation. This regulation establishes the requirements for using an RI/PB FPP in conformance with NFPA 805 as an alternative to the requirements associated with 10 CFR 50.48(b) and Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to 10 CFR Part 50, or the specific plant fire protection license condition. The regulation also includes specific requirements for requesting approval for an RI/PB FPP based on the provisions of NFPA 805.
- Section 50.48(c)(3)(i) of 10 CFR states that:

A licensee may maintain a fire protection program that complies with NFPA 805 as an alternative to complying with [10 CFR 50.48(b)] for plants licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979. The licensee shall submit a request to comply with NFPA 805 in the form of an application for license amendment under § 50.90. The application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof. The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the licensee has identified orders, license conditions, and the technical specifications that must be revised or superseded, and that any necessary revisions are adequate. Any approval by the Director or the designee must be in the form of a license amendment approving the use of NFPA 805 together with any necessary revisions to the technical specifications.

- Appendix A to 10 CFR Part 50, GDC 3, states, in part, that:

Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room.

- The Browns Ferry units were designed and constructed based on the proposed GDC published by the Atomic Energy Commission in the *Federal Register* (32 FR 10213) on July 11, 1967 (for Browns Ferry called "Criteria"). The Atomic Energy Commission

published the final rule that added Appendix A to 10 CFR Part 50, GDC for Nuclear Power Plants, in the *Federal Register* (36 FR 3255) on February 20, 1971. Differences between the draft GDC and final GDC included a consolidation from 70 to 64 criteria. As discussed in the NRC Staff Requirements Memorandum (SRM) for SECY 92-223, dated September 18, 1992 (Reference 6), the Commission decided not to apply the final GDC to plants with construction permits issued prior to May 21, 1971. At the time of promulgation of Appendix A to 10 CFR Part 50, the Commission stressed that the final GDC were not new requirements and were promulgated to more clearly articulate the licensing requirements and practice in effect at that time. Each plant licensed before the final GDC were formally adopted was evaluated on a plant-specific basis determined to be safe and licensed by the Commission.

Appendix A to the Browns Ferry Updated Final Safety Analysis (Reference 7), Criterion 3 - Fire Protection (Category A) states:

The reactor facility shall be designed (1) to minimize the probability of events such as fires and explosions and (2) to minimize the potential effects of such events to safety. Noncombustible and fire resistant materials shall be used whenever practical throughout the facility, particularly in areas containing critical portions of the facility such as containment, control room, and components of engineered safety features.

- Pursuant to 10 CFR 50.90, whenever a holder of a license desires to amend the license or permit, an application for an amendment must be filed with the Commission describing the changes desired, and following, as far as applicable, the form prescribed for original applications. Accordingly, a licensee who seeks to amend its NFPA 805 authorizations must file an amendment stating, as applicable, the desired changes to orders, license conditions, and technical specifications.
- Pursuant to 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Under 10 CFR 50.40, common standards for issuance of licenses include considerations of safety and satisfaction of the requirements of the National Environmental Policy Act of 1969 as implemented in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Under 10 CFR 50.57(a), to issue an operating license, the Commission must find, among other things, that (1) there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public, (2) there is reasonable assurance that such activities will be conducted in compliance with the regulations in this chapter, and (3) the issuance of the license will not be inimical to the common defense and security or to the health and safety of the public. Additional findings required to issue amendments related to fire protection are provided in 10 CFR 50.48.
- In addition, 10 CFR 50.32, "Elimination of repetition," states, in part, that "the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Commission: *Provided*, That such references are clear and specific."

2.4 Applicable Codes, Standards, and Regulatory Guides

- The 2001 Edition of NFPA 805 (Reference 4), which specifies the minimum fire protection requirements for existing light water nuclear power plants during all phases of plant operations, including shutdown, degraded conditions, and decommissioning. NFPA 805 was developed to provide a comprehensive RI/PB standard for fire protection. The NFPA 805 Technical Committee on Nuclear Facilities is composed of nuclear plant licensees, the NRC, insurers, equipment manufacturers, and subject matter experts. The standard was developed in accordance with NFPA processes and consisted of a number of technical meetings and reviews of draft documents by committee and industry representatives. The scope of NFPA 805 includes goals related to nuclear safety, radioactive release, life safety, and plant damage/business interruption. The standard addresses fire protection requirements for nuclear plants during all plant operating modes and conditions, including shutdown and decommissioning, which had not been explicitly addressed by previous requirements and guidelines. NFPA 805 became effective on February 9, 2001.
- Revision 1 of RG 1.205 (Reference 8) provides guidance for use in complying with the requirements that the NRC has promulgated for RI/PB FPPs that comply with 10 CFR 50.48 and the referenced 2001 Edition of the NFPA standard. Revision 1 of RG 1.205 sets forth regulatory positions; clarifies the requirements of 10 CFR 50.48(c) and NFPA 805; clarifies the guidance in Nuclear Energy Institute (NEI) 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," dated April 2008 (Reference 9); and provides exceptions to the NEI 04-02 guidance where required. Should a conflict occur between NEI 04-02 and RG 1.205, the regulatory positions in RG 1.205 govern.
- NEI 04-02 (Reference 9) provides guidance for implementing the requirements of 10 CFR 50.48(c) and represents methods for implementing, in whole or in part, an RI/PB FPP. This implementing guidance for NFPA 805 has two primary purposes: (1) provide direction and clarification for adopting NFPA 805 as an acceptable approach to fire protection consistent with 10 CFR 50.48(c), and (2) provide additional supplemental technical guidance and methods for using NFPA 805 and its appendices to demonstrate compliance with fire protection requirements. Although there is a significant amount of detail in NFPA 805 and its appendices, clarification and additional guidance for select issues help ensure consistency and effective utilization of the standard. The NEI 04-02 guidance focuses attention on the RI/ PB FPP fire protection goals, objectives, and performance criteria contained in NFPA 805 and the RI/PB tools considered acceptable for demonstrating compliance. Revision 2 of NEI-04-02 incorporates guidance from RG 1.205 and approved Frequently Asked Questions.

3.0 TECHNICAL EVALUATION

3.1 Background

In its LAR, the licensee proposed to extend the implementation due dates for Modifications 102 and 106. The licensee determined that the completion dates for Modifications 102 and 106 should be extended to the end of the Unit 1 Fall 2020 outage and April 30, 2020, respectively, due to technical and scheduling difficulties related to implementation of these modifications. The licensee further stated that it is attempting to implement Modifications 102 and 106 by the

due dates; however, an extension of the due date will ensure that it can complete the modifications and not impact operation and safety of the Browns Ferry units. The licensee further stated that these modifications are fire protection system upgrades for NFPA code compliance and are not credited in its Fire Probability Risk Assessment (FPRA); therefore, they have no direct impact on fire risk.

3.2 Licensee's Technical Bases for Requested Change

In its LAR, the licensee discussed its rationale for requesting an extension of the implementation due dates for Modifications 102 and 106.

The licensee stated that Modification 102 upgrades the fire detection and suppression features for each unit's main transformer, unit station service transformer, and common station service transformer to be supervised. The licensee further stated that the transformers are protected by a water deluge system that is initiated by heat detectors and transformer protective relays, and that the previous design was not supervised such that certain types for failures were not immediately detected and alarmed and would only be discovered during periodic testing. The licensee further stated that as discussed in its LAR dated October 18, 2018, Modification 102 is divided into ten separate stages and that all stages of Modification 102 are complete except for Stage 5, which completes the modification on Browns Ferry, Unit 3. The licensee further stated that Stage 5 is installed and is currently being tested.

The licensee stated that when the supervisory modules for Modification 102 were activated on Browns Ferry, Unit 1, preexisting grounds in the existing heat detector circuitry were detected, causing the system to generate trouble alarms as designed. The licensee also stated that because the unit was at power when the modification was completed on Browns Ferry, Unit 1, there are personnel safety concerns with attempting to repair the grounds in the heat detector circuitry near the transformers without deenergizing the transformers and shutting down Browns Ferry Unit 1. The licensee further stated that because of the trouble alarms, the heat detector input to the fire alarm system from the Unit 1 Main Bank transformers was disabled and that inputs from a manual push button station and transformer protective relays are in service and functioning. The licensee further stated that with the heat detectors disabled, it does not consider the license condition met. The licensee stated that the proposed change to the Modification 102 implementation due date will allow the necessary time to repair the grounds during the next refueling outage for Browns Ferry, Unit 1, in Fall 2020.

The licensee stated that the affected detection and suppression systems are not credited in the FPRA and that delaying completion of the modification until the end of the Browns Ferry, Unit 1, Fall 2020 outage has no effect on the FPRA. The licensee further stated that compensatory measures are in place to address the fire suppression system.

The licensee stated that Modification 106 installs a new water intake pumping station to supply bearing lubrication water to the cooling tower lift pumps when they are in operation during the warm season. The licensee further stated that due to limited capability of the existing raw service water pumps, operation of fire pumps, which share the same piping system, is currently required to provide adequate flow to the cooling tower lift pumps. The licensee stated that the goal of Modification 106 is to eliminate reliance on fire pumps for this routine operational purpose.

The licensee stated that the new pumping station has been delivered and placed on its foundation, and that remaining work on the station involves electrical and piping connections

and post-modification testing. The licensee further stated that successful performance of the new pumping station depends on existing check valves in the raw service water system that are old and suspected of back leakage, and therefore, are scheduled to be replaced. The licensee further stated that one of the check valves in the Modification 106 flow path is also needed to support cooling tower operation, and therefore, the check valve is scheduled for replacement after the end of the 2019 cooling tower season. The licensee further stated that an earlier attempt to replace the check valve prior to the start of cooling tower season was delayed due to difficulty obtaining adequate isolation, and the replacement of the check valve was unable to be completed before it required the ability to place the Browns Ferry cooling towers in service in 2019. The licensee explained that the current implementation due date of October 14, 2019, does not provide sufficient time (margin) regarding the date when it no longer requires the Browns Ferry cooling towers in the fall. The licensee determined that the end of cooling tower season is dependent on weather patterns and the effect of the extended power uprate, which is new for the 2019 cooling tower season. The licensee stated that the proposed extended implementation due date negates the need for a separate expedited LAR in the future for this modification.

The licensee stated that fire pumps are not modeled in the FPRA, but their availability and reliability is considered to support fire suppression, and they are not credited in the deterministic Nuclear Safety Capability Assessment to meet the nuclear safety goals. The licensee further stated that delaying completion of the modification until April 30, 2020, would have a negligible impact on core damage frequency/incremental core damage probability and large early release frequency/incremental large early release probability due to the small impact that routine operation of the fire pumps has on fire suppression reliability, combined with the limited time duration of the extension.

3.3 Safety Margins

The licensee stated that Modifications 102 and 106 maintain codes and standards and that this LAR only involves implementation timeframes. The licensee further stated that the proposed changes associated with Modifications 102 and 106 do not involve any licensing basis analyses, and therefore, the safety margin inherent in the analyses for fire events has been preserved.

3.4 Defense-in-Depth

The licensee stated that the three echelons of defense-in-depth are: (1) prevent fires from starting (i.e., combustible/hot work controls); (2) rapidly detect fires, control, and extinguish fires that do occur, thereby limiting fire damage (i.e., fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans); and (3) provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (i.e., fire barriers, fire rated cable, success path remains free of fire damage, recovery actions).

The licensee stated that the affected systems do not prevent fires from starting and are not used for plant shutdown; therefore, these changes do not affect echelons 1 or 3. The licensee further stated that Modifications 102 and 106 are specific to fire suppression and detection systems, and therefore, the proposed changes are related to echelon 2. The licensee stated that the fire pumps and the transformer detection and suppression systems are capable of detecting and suppressing fires as they are currently designed. The affected fire protection systems remain

capable of detecting, controlling, and extinguishing fires without Modifications 102 and 106, and therefore, defense-in-depth is maintained.

3.5 NRC Staff Evaluation

In accordance with 10 CFR 50.48(c)(3)(i), the licensee submitted an LAR to revise its NFPA 805 LCs 2.C.(13), 2.C.(14), and 2.C.(7). The NRC staff reviewed the information provided in the LAR and also 10 CFR 50.48(c) and RG 1.205, Section 2.1, to determine if the licensee's proposed changes to extend the due dates for Modifications 102 and 106 are acceptable.

The NRC staff found that 10 CFR 50.48(c) does not mandate a specific schedule for implementing an FPP that meets NFPA 805. However, the NRC staff noted that the statement of considerations for 10 CFR 50.48(c) states that the NFPA 805 license amendment will include a license condition imposing the use of NFPA 805, together with an implementation schedule. The NRC staff also found that RG 1.205 provides guidance that states that licensees should include an implementation schedule with their request to adopt an FPP based on NFPA 805.

The NRC staff found that RG 1.205 includes guidance that states for changes that involve acceptance of an existing unapproved condition (i.e., a noncompliance), appropriate compensatory measures should be established and should remain in place until either the plant is modified to achieve compliance or the condition is found acceptable. RG 1.205 includes additional guidance that states that acceptance of the as-found condition may be the result of either the NRC's review and approval or the self-approval process according to the licensee's fire protection license condition.

The NRC staff found that the sample license condition in RG 1.205 states, in part, that the licensee shall maintain appropriate compensatory measures in place until completion of the modifications.

Although the licensee included discussions regarding risk, defense-in-depth, and safety margins in its LAR, the NRC staff determined that 10 CFR 50.48(c) does not mandate any specific requirements for the schedule that implement an FPP that meets NFPA 805, and therefore, the requirements of NFPA 805, Section 4.2.4.2, concerning fire risk evaluations that require evaluations of risk, defense-in-depth, and safety margins are not applicable.

The NRC staff determined that risk is not impacted by extending the due date to complete Modifications 102 and 106, because the modifications are related to code compliance and are not credited in the licensee's FPRA. In addition, compensatory measures are in place until the modifications are completed, and not completing either of the modifications has no impact on the affected systems' ability to perform their intended functions.

The NRC staff determined that the extensions to complete Modifications 102 and 106 are acceptable because the license amendments will continue to include a license condition imposing the use of NFPA 805, together with an implementation schedule that follows the guidance of RG 1.205. The fire protection transition license conditions will remain in effect during this period, including maintaining compensatory measures until all the NFPA 805 modifications are completed, which follows the guidance of RG 1.205.

3.6 Technical Conclusion

Based on its review of the information submitted by the licensee, and in accordance with 10 CFR 50.48(c)(3)(i), the NRC staff concludes that the proposed changes are acceptable. The proposed changes regarding Modifications 102 and 106 and the license conditions are acceptable because the transition license conditions will remain in effect, as will the compensatory measures during the extension periods.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

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

In its letter dated July 3, 2019, the licensee provided its analysis of the issue of NSHC. The licensee's analysis is as follows:

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

Response: No.

The proposed amendment adds the reference to this letter [TVA letter dated July 3, 2019] to the BFN RFOL License Condition, Transition Condition 2, paragraphs 2.C.(13), 2.C.(14), and 2.C.(7) for BFN Units 1, 2, and 3, respectively. The change encompassed by the proposed amendment is to extend the implementation due dates of Modifications 102 and 106.

Modification 102 modifies the actuation circuitry for a transformer spray fire suppression system. Delaying implementation of this modification does not adversely affect accident initiators or precursors nor alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed change does not affect the ability to transfer to alternate onsite power sources in the event of a loss of a transformer and therefore does not affect the ability of structures, systems and components (SSCs) to perform their intended safety function to mitigate the consequences of an initiating event within the assumed acceptance limits.

Therefore, these proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No.

The proposed amendment adds the reference to this letter to the BFN RFOL License Condition, Transition Condition 2, paragraphs 2.C.(13), 2.C.(14), and 2.C.(7) for BFN Units 1, 2, and 3, respectively. The changes encompassed by the proposed amendment are to extend the implementation due dates of Modifications 102 and 106.

There is no direct impact to CDF [core damage frequency] or LERF [large early release frequency]. These proposed changes are an NFPA 805 Chapter 3 compliance issue only, and this level of detail is not modeled in the FPRA.

The proposed change does not result in any new or different kinds of accident from that previously evaluated because it does not change any precursors or equipment that is previously credited for accident mitigation.

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

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

Response: No.

The proposed amendment adds the reference to this letter to the BFN RFOL License Condition, Transition Condition 2, paragraphs 2.C.(13), 2.C.(14), and 2.C.(7) for BFN Units 1, 2, and 3, respectively. The change encompassed by the proposed amendment is to extend the implementation due dates of Modifications 102 and 106.

The proposed changes associated with Modifications 102 and 106 do not involve any licensing basis analyses. Therefore, the safety margin inherent in the analyses for fire events has been preserved.

Therefore, based on the above discussion, these proposed changes do not involve a reduction in the margin of safety.

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

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Alabama official was notified of the proposed issuance of the amendments on July 18, 2019. The State official had no comments.

6.0 PUBLIC COMMENTS

On July 11, 2019, the NRC staff published in the *Federal Register* (84 FR 33094) a proposed "Notice of Consideration of Issuance of Amendments to Facility Operating Licenses, Proposed

No Significant Hazards Consideration Determination, and Opportunity for a Hearing,” associated with the proposed amendment request. In accordance with the requirements in 10 CFR 50.91, the notice provided a 30-day period for public comment on the proposed NSHC determination. One public comment was received on August 12, 2019 (ADAMS Accession No. ML19225C295), associated with the NRC staff’s published NSHC determination, which was included in the July 11, 2019, *Federal Register* Notice. The public comment was a “General Comment” in support of the nuclear power as a renewable power and issuance of the proposed amendment. The public comment stated that:

Nuclear power remains one of the great untapped hopes of renewable power in the 21st century and beyond. While America’s foray into this realm has been half-hearted and sporadic, we should support the continuation of current efforts to utilize nuclear energy to power our nation’s grid. The license issuance, as not affecting the current safety levels of the plants, undoubtedly should be issued.

The maintenance and support of our nation’s current nuclear energy array should be continued until expansion can be enabled. The Browns Ferry Nuclear Plant, as the nation’s second most powerful nuclear energy generator, should continue to be supported by the Tennessee Valley Authority, the Nuclear Regulatory Commission, our policymakers and the public as we continue to develop the science behind nuclear energy and expand the economic, regulatory, and social support for it.

The NRC staff acknowledges the commenter’s views, which are general in nature and do not affect the staff’s NSHC determination or the proposed license amendments. No NRC response is needed.

7.0 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. 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, published in the *Federal Register* on July 11, 2019 (84 FR 33094). One public comment was received that, as discussed above, does not affect the NRC staff’s NSHC determination or the proposed license amendments. 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 needs to be prepared in connection with the issuance of the amendments.

8.0 CONCLUSION

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

9.0 REFERENCES

- 1 Polickoski, J. T., TVA letter to U.S. NRC, "TVA Request for Revision for Extension of Implementation Due Dates of Modifications 102 and 106 Related to NFPA 805 for the Browns Ferry Nuclear Plant, Units 1, 2, and 3," dated July 3, 2019 (ADAMS Accession No. ML19184A633).
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Shivani Mehta

Date: August 13, 2019

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3 – ISSUANCE OF AMENDMENT NOS. 308, 331, AND 291 TO EXTEND IMPLEMENTATION DUE DATE FOR MODIFICATIONS 102 AND 106 RELATED TO NFPA 805, “PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION OF LIGHT WATER REACTOR ELECTRIC GENERATING PLANTS” (EPID L-2019-LLA-0140) DATED AUGUST 13, 2019

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