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

November 8, 2017

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 - ISSUANCE OF AMENDMENTS REGARDING REQUEST TO ADOPT TSTF-545 AND TSTF-299 (CAC NOS. MF9084, MF9085, AND MF9086) (EPID L2017-LLA-0162)

Dear Mr. Shea:

The Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 301, 325, and 285 to Renewed Facility Operating License 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 your application dated January 17, 2017, as supplemented by letter dated June 29, 2017. The amendments change the Browns Ferry Units 1, 2, and 3 technical specifications (TSs) consistent with Technical Specifications Task Force (TSTF) Standard Technical Specifications Change Traveler TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing," and TSTF-299, Revision 0, "Administrative Controls Program 5.5.2.b Test Interval and Exception."

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

Sincerely,

Farideh E. Saba

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. 301 to DPR-33
2. Amendment No. 325 to DPR-52
3. Amendment No. 285 to DPR-68
4. Safety Evaluation

cc w/enclosures: Distribution via 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. 301
Renewed License No. DPR-33

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated January 17, 2017, as supplemented by letter dated June 29, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-33 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 301, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for

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 and Technical Specifications

Date of Issuance: November 8, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 301

BROWNS FERRY NUCLEAR PLANT, UNIT 1

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33

DOCKET NO. 50-259

Replace page 3 of Renewed Facility Operating License No. DPR-33 with the attached revised page 3.

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain a marginal line indicating the areas of change.

REMOVE	INSERT
1.1-3	1.1-3
3.4-8	3.4-8
3.5-5	3.5-5
3.5-11	3.5-11
3.6-16	3.6-16
3.6-23	3.6-23
3.6-33	3.6-33
5.0-9	5.0-9
5.0-12	5.0-12
5.0-13	5.0-13

(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. 301, 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.

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites."
INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs: 4, 4, 5 Setpoint (psig): 1135, 1145, 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each required S/RV opens when manually actuated.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTES---------- 1. Only required to be performed when in MODE 4 > 48 hours. 2. Not required to be performed if performed within the previous 31 days. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel.	Once prior to entering MODE 2 from MODE 3 or 4
SR 3.5.1.6	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified pressure.	In accordance with the INSERVICE TESTING PROGRAM

SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF
Core Spray	≥ 6250 gpm	2	> 105 psid

SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE
LPCI	≥ 12,000 gpm	2	≥ 250 psig
LPCI	≥ 9,000 gpm	1	≥ 125 psig

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE					FREQUENCY
SR 3.5.2.4	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified pressure.				In accordance with the INSERVICE TESTING PROGRAM
	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF	
	CS	≥ 6250 gpm	2	≥ 105 psid	
	SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE	
	LPCI	≥ 9,000 gpm	1	≥ 125 psig	
SR 3.5.2.5	----------NOTE---------- Vessel injection/spray may be excluded. ----------				
	Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.				24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	24 months
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	24 months on a STAGGERED TEST BASIS
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	----------NOTES---------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. ---------- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	24 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate $\geq$ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

5.5 Programs and Manuals

5.5.1 Offsite Dose Calculation Manual (ODCM) (continued)

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include the Core Spray, High Pressure Coolant Injection, Residual Heat Removal, and Reactor Core Isolation Cooling. The program shall include the following preventive maintenance:

a. Periodic visual inspection requirements; and

b. System leak test requirements for each system, to the extent permitted by system design and radiological conditions, at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

(continued)

5.5 Programs and Manuals

5.5.4 Radioactive Effluent Controls Program (continued)

h. Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I;

i. Limitations on the annual and quarterly doses to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and

j. Limitations on the annual dose or dose commitment to any member of the public beyond the site boundary due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

k. The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Radioactive Effluent Controls Program surveillance frequency.

5.5.5 Component Cyclic or Transient Limit

This program provides controls to track the FSAR Section 4.2.5, cyclic and transient occurrences to ensure that components are maintained within the design limits.

5.5.6 Inservice Testing Program (Deleted)

Note: See Section 1.1 for the definition of INSERVICE TESTING PROGRAM.

(continued)

5.5 Programs and Manuals

This page intentionally left blank.

(continued)

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-260

BROWNS FERRY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 325
Renewed License No. DPR-52

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated January 17, 2017, as supplemented by letter dated June 29, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-52 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 325, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

For

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 and Technical Specifications

Date of Issuance: November 8, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 325

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-52

BROWNS FERRY NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-260

Replace page 3 of Renewed Facility Operating License No. DPR-52 with the attached revised page 3.

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain a marginal line indicating the areas of change.

REMOVE	INSERT
1.1-3	1.1-3
3.4-8	3.4-8
3.5-5	3.5-5
3.5-11	3.5-11
3.6-16	3.6-16
3.6-23	3.6-23
3.6-33	3.6-33
5.0-9	5.0-9
5.0-12	5.0-12
5.0-13	5.0-13

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. 325, 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

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites."
INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).

(continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs — Setpoint (psig) 4 — 1135 4 — 1145 5 — 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each required S/RV opens when manually actuated.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTES---------- 1. Only required to be performed when in MODE 4 > 48 hours. 2. Not required to be performed if performed within the previous 31 days. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel.	Once prior to entering MODE 2 from MODE 3 or 4
SR 3.5.1.6	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified pressure.	In accordance with the INSERVICE TESTING PROGRAM

SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF
Core Spray	≥ 6250 gpm	2	≥ 105 psid

SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE
LPCI	≥ 12,000 gpm	2	≥ 250 psig
LPCI	> 9,000 gpm	1	> 125 psig

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE					FREQUENCY
SR 3.5.2.4	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified pressure.				In accordance with the INSERVICE TESTING PROGRAM
	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF	
	CS	≥ 6250 gpm	2	≥ 105 psid	
	SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE	
	LPCI	≥ 9,000 gpm	1	≥ 125 psig	
SR 3.5.2.5	----------NOTE---------- Vessel injection/spray may be excluded. ----------				
	Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.				24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	24 months
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	24 months on a STAGGERED TEST BASIS
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1	----------NOTES---------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. --- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	24 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

5.5 Programs and Manuals

5.5.1 Offsite Dose Calculation Manual (ODCM) (continued)

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include the Core Spray, High Pressure Coolant Injection, Residual Heat Removal, and Reactor Core Isolation Cooling. The program shall include the following preventive maintenance:

a. Periodic visual inspection requirements; and

b. System leak test requirements for each system, to the extent permitted by system design and radiological conditions, at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

(continued)

5.5 Programs and Manuals

5.5.4 Radioactive Effluent Controls Program (continued)

h. Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I;

i. Limitations on the annual and quarterly doses to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and

j. Limitations on the annual dose or dose commitment to any member of the public beyond the site boundary due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

k. The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Radioactive Effluent Controls Program surveillance frequency.

5.5.5 Component Cyclic or Transient Limit

This program provides controls to track the FSAR Section 4.2.5, cyclic and transient occurrences to ensure that components are maintained within the design limits.

5.5.6 Inservice Testing Program (Deleted)

Note: See Section 1.1 for the definition of INSERVICE TESTING PROGRAM.

(continued)

5.5 Programs and Manuals

This page intentionally left blank.

(continued)

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

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-296

BROWNS FERRY NUCLEAR PLANT, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 285
Renewed License No. DPR-68

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated January 17, 2017, as supplemented by letter dated June 29, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-68, and is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 285, are hereby incorporated in the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

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 and Technical Specifications

Date of Issuance: November 8, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 285

BROWNS FERRY NUCLEAR PLANT, UNIT 3

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-68

DOCKET NO. 50-296

Replace page 3 of Renewed Facility Operating License No. DPR-68 with the attached revised page 3.

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain a marginal line indicating the areas of change.

REMOVE	INSERT
1.1-3	1.1-3
3.4-8	3.4-8
3.5-5	3.5-5
3.5-11	3.5-11
3.6-16	3.6-16
3.6-23	3.6-23
3.6-33	3.6-33
5.0-9	5.0-9
5.0-12	5.0-12
5.0-13	5.0-13

(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. 285, 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.

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites."
INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the license program that fulfills the requirements of 10 CFR 50.55a(f).

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	Verify the safety function lift settings of the required 12 S/RVs are within ± 3% of the setpoint as follows: Number of S/RVs / Setpoint (psig) 4 / 1135 4 / 1145 5 / 1155 Following testing, lift settings shall be within ± 1%.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.4.3.2	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each required S/RV opens when manually actuated.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTES---------- 1. Only required to be performed when in MODE 4 > 48 hours. 2. Not required to be performed if performed within the previous 31 days. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel.	Once prior to entering MODE 2 from MODE 3 or 4
SR 3.5.1.6	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified pressure. SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF SYSTEM — FLOW RATE — NO. OF PUMPS Core Spray — ≥ 6250 gpm — 2 — > 105 psid INDICATED SYSTEM PRESSURE SYSTEM — FLOW RATE — NO. OF PUMPS LPCI — ≥ 12,000 gpm — 2 — ≥ 250 psig LPCI — > 9,000 gpm — 1 — > 125 psig	In accordance with the INSERVICE TESTING PROGRAM

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE					FREQUENCY
SR 3.5.2.4	Verify each required ECCS pump develops the specified flow rate against a system head corresponding to the specified pressure.				In accordance with the INSERVICE TESTING PROGRAM
	SYSTEM	FLOW RATE	NO. OF PUMPS	SYSTEM HEAD CORRESPONDING TO A VESSEL TO TORUS DIFFERENTIAL PRESSURE OF	
	CS	> 6250 gpm	2	≥ 105 psid	
	SYSTEM	FLOW RATE	NO. OF PUMPS	INDICATED SYSTEM PRESSURE	
	LPCI	≥ 9,000 gpm	1	≥ 125 psig	
SR 3.5.2.5	----------NOTE---------- Vessel injection/spray may be excluded. ----------				
	Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.				24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.6	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.6.1.3.8	Verify a representative sample of reactor instrumentation line EFCVs actuate to the isolation position on a simulated instrument line break signal.	24 months
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	24 months on a STAGGERED TEST BASIS
SR 3.6.1.3.10	Verify leakage rate through each MSIV is ≤ 100 scfh and that the combined leakage rate for all four main steam lines is ≤ 150 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	----------NOTES---------- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. One drywell suppression chamber vacuum breaker may be nonfully closed so long as it is determined to be not more than 3° open as indicated by the position lights. --- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.6.2	Perform a functional test of each required vacuum breaker.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.6.1.6.3	Verify the differential pressure required to open each vacuum breaker is ≤ 0.5 psid.	24 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.2.3.2	Verify each RHR pump develops a flow rate ≥ 9000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the INSERVICE TESTING PROGRAM

5.5 Programs and Manuals

5.5.1 Offsite Dose Calculation Manual (ODCM) (continued)

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include the Core Spray, High Pressure Coolant Injection, Residual Heat Removal, and Reactor Core Isolation Cooling. The program shall include the following preventive maintenance:

a. Periodic visual inspection requirements; and

b. System leak test requirements for each system, to the extent permitted by system design and radiological conditions, at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

(continued)

5.5 Programs and Manuals

5.5.4 Radioactive Effluent Controls Program (continued)

h. Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I;

i. Limitations on the annual and quarterly doses to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and

j. Limitations on the annual dose or dose commitment to any member of the public beyond the site boundary due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

k. The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Radioactive Effluent Controls Program surveillance frequency.

5.5.5 Component Cyclic or Transient Limit

This program provides controls to track the FSAR Section 4.2.5, cyclic and transient occurrences to ensure that components are maintained within the design limits.

5.5.6 Inservice Testing Program (Deleted)

Note: See Section 1.1 for the definition of INSERVICE TESTING PROGRAM.

(continued)

5.5 Programs and Manuals

This page intentionally left blank.

(continued)

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 301

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-33,

AMENDMENT NO. 325 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-52,

AND AMENDMENT NO. 285 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 application dated January 17, 2017 (Reference 1), as supplemented by letter dated June 29, 2017 (Reference 2), Tennessee Valley Authority (the licensee), requested changes to the technical specifications (TSs) for Browns Ferry Nuclear Plant, Units 1, 2, and 3 (Browns Ferry). Specifically, the licensee requested changes to the TSs consistent with Technical Specifications Task Force (TSTF) Standard Technical Specifications (STSs) Change Traveler TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR [Surveillance Requirement] Usage Rule Application to Section 5.5 Testing," dated October 21, 2015 (Reference 3) and TSTF-299, Revision 0, "Administrative Controls Program 5.5.2.b Test Interval and Exception," (Reference 4).

The licensee proposed to delete Browns Ferry TS 5.5.6, "Inservice Testing Program," and add a new defined term, "INSERVICE TESTING PROGRAM," to the TSs. All existing references to the "Inservice Testing Program" in the Browns Ferry SRs are replaced with "INSERVICE TESTING PROGRAM" so that the SRs refer to the new definition in lieu of the deleted program.

The licensee also proposed to revise TS 5.5.2, "Primary Coolant Sources Outside Containment," to clarify the intent of refueling cycle intervals (i.e., 24-month intervals) with respect to system integrated leak test requirements and to add a statement that the provisions of SR 3.0.2 are applicable.

The licensee's letter dated January 17, 2017, also included a request to use American Society of Mechanical Engineers (ASME) Code Case OMN-20, "Inservice Test Frequency," as an alternative to certain ASME Codes for Operation and Maintenance of Nuclear Power Plants (OM Code) requirements at Browns Ferry. The Nuclear Regulatory Commission (NRC or the Commission) considered this request separately from the proposed license amendment, and authorized the licensee's use of this alternative by letter dated August 11, 2017 (Reference 5).

The supplement dated June 29, 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* (FR) on April 25, 2017 (82 FR 19106).

2.0 REGULATORY EVALUATION

2.1 Description of Inservice Testing Requirements and TSTF-545

An inservice test is a test to assess the operational readiness of a structure, system, or component after first electrical generation by nuclear heat. The ASME OM Code provides requirements for inservice testing (IST) of certain components in light-water nuclear power plants. The ASME OM Code identifies the components subject to the testing (i.e., pumps, valves, pressure relief devices, and dynamic restraints), responsibilities, methods, intervals, parameters to be measured and evaluated, criteria for evaluating results, corrective actions, personnel qualification, and recordkeeping. Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(f), "Inservice testing requirements," requires that IST of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda. The facility's TSs also prescribe IST requirements and frequencies for ASME Code Class 1, 2, and 3 components.

The regulation in 10 CFR 50.55a(f)(5)(ii) states, in part, "If a revised inservice test program for a facility conflicts with the technical specifications for the facility, the licensee must apply to the Commission for amendment of the technical specifications to conform the technical specifications to the revised program." TSTF-545, Revision 3, provides guidance to licensees on how to request license amendments that would eliminate conflicting requirements between 10 CFR 50.55a, "Codes and standards," and the TSs. TSTF-545, Revision 3, proposed elimination of the "Inservice Testing Program" from the "Administrative Controls" section of the TSs. However, the TSs contain surveillances that require testing or test intervals in accordance with the Inservice Testing Program. The elimination of the Inservice Testing Program from the TSs could cause uncertainty regarding the correct application of these SRs. Therefore, TSTF-545, Revision 3, also proposes adding a new definition, "INSERVICE TESTING PROGRAM," to the TSs, which would be defined as "the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." TSTF-545, Revision 3, proposes replacement of existing uses of the term, "Inservice Testing Program," with the defined term, as denoted by capitalized letters, throughout the TSs.

The NRC approved TSTF-545, Revision 3, by letter dated December 11, 2015 (Reference 6), and published a notice of availability in the FR on March 28, 2016 (81 FR 17208).

2.2 Description of Primary Coolant Sources Outside Containment and TSTF-299

Browns Ferry, TS 5.5.2, "Primary Coolant Sources Outside Containment," provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include the core spray, high pressure coolant injection, residual heat removal, and reactor core isolation cooling.

TSTF-299, Revision 0, revised TS 5.5.2 to clarify the intent of refueling cycle intervals with respect to the system integrated leak test requirements (i.e., 24-month intervals) and to add the

following sentence, "The provisions of SR 3.0.2 are applicable." The NRC approved TSTF-299, Revision 0 on October 31, 2000 (Reference 4).

2.3 Proposed Technical Specifications Changes

2.3.1 TS 5.5.6, "Inservice Testing Program"

The licensee requested to delete TS 5.5.6 from the Administrative Controls section of TSs and add "(Deleted)" next to the title, "Inservice Testing Inspection." The licensee requested to add "(Deleted)" in a later supplement dated June 29, 2017 (ADAMS ML17180A158) to ensure consistency between the license amendment request (LAR) and TSTF-545, Revision 3.

The licensee also proposed to add the words "Note: See Section 1.1 for the definition of INSERVICE TESTING PROGRAM" after the title.

TS 5.5.6 currently states:

> This program provides controls for inservice testing of ASME Code Class 1, 2, and 3 components. The program shall include the following:
>
> a. Testing frequencies applicable to the ASME Code for Operation and Maintenance (ASME OM Code) and applicable Addenda as follows:
>
> | ASME OM Code and applicable Addenda terminology for inservice testing activities | Required Frequencies for performing inservice testing activities |
> |---|---|
> | Weekly | At least once per 7 days |
> | Monthly | At least once per 31 days |
> | Quarterly or every 3 months | At least once per 92 days |
> | Semiannually or every 6 months | At least once per 184 days |
> | Every 9 months | At least once per 276 days |
> | Yearly or annually | At least once per 366 days |
> | Biennially or every 2 years | At least once per 731 days |
>
> b. The provisions of SR 3.0.2 are applicable to the above required Frequencies and to other normal and accelerated Frequencies specified as 2 years or less in the Inservice Testing Program for performing Inservice testing activities;
>
> c. The provisions of SR 3.0.3 are applicable to inservice testing activities; and
>
> d. Nothing in the ASME OM Code shall be construed to supersede the requirements of any TS.

SR 3.0.2 allows an extension of IST intervals by up to 25 percent. If it is discovered that a surveillance associated with an IST activity was not performed within the required interval, SR 3.0.3 allows the licensee to delay declaring the associated limiting condition for operation

not met in order to perform the missed surveillance. The licensee did not request changes to SR 3.0.2 or SR 3.0.3.

The licensee requested to revise the Definitions section of TSs by adding the term, "INSERVICE TESTING PROGRAM," with the following definition: "The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." The licensee also requested that all existing occurrences of "Inservice Testing Program" in TS SRs be replaced with "INSERVICE TESTING PROGRAM," so that the SRs refer to the new definition in lieu of the deleted program.

2.3.2 TS 5.5.2, "Primary Coolant Sources Outside Containment"

TS 5.5.2 currently states:

> This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include the Core Spray, High Pressure Coolant Injection, Residual Heat Removal, and Reactor Core Isolation Cooling. The program shall include the following preventive maintenance:
>
> a. Periodic visual inspection requirements; and
>
> b. System leak test requirements for each system, to the extent permitted by system design and radiological conditions, at refueling cycle intervals or less.

The licensee requested to delete the words "refueling cycle intervals or less" and replace them with "least once per 24 months." The licensee also proposed to add the following statement after TS 5.5.2.b: "The provisions of SR 3.0.2 are applicable."

2.4 Regulatory Requirements and Guidance

The NRC staff considered the following regulatory requirements, guidance, and licensing information during its review of the proposed changes:

Technical Specifications

Paragraph 50.36(c) of 10 CFR requires TSs to include the following categories: (1) safety limits, limiting safety systems settings, and control settings; (2) limiting conditions for operation; (3) SRs; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notification; and (8) written reports. Section 50.36(c)(3) of 10 CFR states that "[s]urveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met." Section 50.36(c)(5) of 10 CFR states that "[a]dministrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner."

The NRC staff's guidance for review of the TSs is in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," Chapter 16, "Technical Specifications," Revision 3, dated March 2010 (Reference 7).

As described therein, as part of the regulatory standardization effort, the staff has prepared improved STSs for each of the LWR nuclear steam supply systems and associated balance-of-plant equipment systems. The licensee's proposed amendment is based on TSTF-545, Revision 3, and TSTF-299, Revision 0, which are NRC-approved changes to the improved STSs. The staff's review includes consideration of whether the proposed changes are consistent with TSTF-545, Revision 3 and TSTF-299, Revision 0. Special attention is given to TS provisions that depart from the improved STSs, as modified by NRC-approved TSTF travelers, to determine whether proposed differences are justified by uniqueness in plant design or other considerations so that 10 CFR 50.36 is met. In addition, the guidance states that comparing the change to previous STS can help clarify the TS intent.

Inservice Testing

Pursuant to 10 CFR 50.54, "Conditions of licenses," the applicable requirements of 10 CFR 50.55a are conditions of every nuclear power reactor operating license issued under 10 CFR Part 50. These requirements include IST of pumps and valves at nuclear power reactors in accordance with the ASME OM Code as specified in 10 CFR 50.55a(f). The regulations in 10 CFR 50.55a(f) state, in part:

> Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPV [Boiler and Pressure Vessel] Code and ASME Code for Operation and Maintenance of Nuclear Power Plants as specified in this paragraph. Each operating license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions [referring to 10 CFR 50.55a(f)(1) through (f)(6)]. . . .

The ASME OM Code is a consensus standard, which is incorporated by reference into 10 CFR 50.55a. During the incorporation process, the NRC staff reviewed the ASME OM Code requirements for technical sufficiency and found that the ASME OM Code IST program requirements were suitable for incorporation into the NRC's rules.

The regulation in 10 CFR 50.55(a)(f)(5)(ii) states, in part: "If a revised inservice test program for a facility conflicts with the technical specifications for the facility, the licensee must apply to the Commission for amendment of the technical specifications to conform the technical specifications to the revised program."

NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants," final report, October 2013 (Reference 8) provides guidance for the IST of pumps and valves.

NUREG-0800, Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints," Revision 3, March 2007 (Reference 9), provides guidance and acceptance criteria for the NRC staff review of the IST program for pumps and valves.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's application to determine if the proposed changes are consistent with the guidance, regulations, and licensing information discussed in Section 2.4 of this safety evaluation. In determining whether an amendment to a license will be issued, the

Commission is guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Among the considerations are whether the TSs, as amended, would provide the necessary administrative controls per 10 CFR 50.36(c)(5) (i.e., provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner). In making its determination as to whether to amend the license, the staff considered those regulatory requirements that are automatically conditions of the license through 10 CFR 50.54. Where the regulations already condition the license, there is no need for a duplicative requirement in the TSs; the regulations provide the necessary reasonable assurance of the health and safety of the public.

3.1 Deletion of the Inservice Testing Program from the TSs

TS 5.5.6 requires the licensee to have an IST program that provides controls for IST of ASME Code Class 1, 2, and 3 components (i.e., pumps and valves). Through 10 CFR 50.54, the applicable requirements of 10 CFR 50.55a are conditions of every nuclear power reactor operating license issued under 10 CFR Part 50. These requirements include 10 CFR 50.55a(f), which specifies the requirements for the IST of pumps and valves. Therefore, requiring the licensee to have an IST program in TSs is duplicative of the license condition in 10 CFR 50.54. Thus, with the proposed TS changes, the licensee will still be required to maintain an IST program in accordance with the ASME OM Code, as specified in 10 CFR 50.55a(f). For the reasons explained below, it is not necessary to have additional administrative controls in the TSs relating to the IST program to assure operation of the facility in a safe manner.

Consideration of TS 5.5.6.a

The ASME OM Code requires testing to normally be performed within certain time periods. TS 5.5.6.a sets IST frequencies more precisely than those specified in the ASME OM Code and applicable addenda (e.g., "at least once per 31 days" contrasted with "monthly"). However, the NRC staff determined that the more precise IST frequencies are not necessary to assure operation of the facility in a safe manner.

Consideration of TS 5.5.6.b

TS 5.5.6.b allows the licensee to extend, by up to 25 percent, the interval between IST activities, as required by TS 5.5.6.a and for other normal and accelerated frequencies specified as 2 years or less in the IST program. Similar to TS 5.5.6.b, the NRC authorization of ASME Code Case OMN-20, "Inservice Test Frequency," by letter dated August 11, 2017 (Reference 10), also permits the licensee to extend the IST intervals specified in the ASME OM Code by up to 25 percent.

The NRC staff determined that the TS 5.5.6.b allowance to extend IST intervals is not needed to assure operation of the facility in a safe manner. Therefore, the NRC staff determined that deletion of TS 5.5.6.b is acceptable. The deletion of TS 5.5.6.b does not impact the licensee's ability to extend IST intervals using Code Case OMN-20, as authorized by the NRC.

Consideration of TS 5.5.6.c

TS 5.5.6.c allows the licensee to use SR 3.0.3 when it discovers that an SR associated with an inservice test was not performed within its specified frequency. SR 3.0.3 allows the licensee to delay declaring a limiting condition for operation not met in order to perform the missed

surveillance. The use of SR 3.0.3 for inservice tests is limited to those inservice tests required by an SR. In accordance with 10 CFR 50.55a, the licensee may also request relief from the ASME OM Code requirements to address issues associated with a missed inservice test. Deletion of TS 5.5.6.c does not change any of these requirements, and SR 3.0.3 will continue to apply to those inservice tests required by SRs. Based on the above, the NRC staff determined that deletion of TS 5.5.6.c is acceptable.

Consideration of TS 5.5.6.d

TS 5.5.6.d states that nothing in the ASME OM Code shall be construed to supersede the requirements of any TS. However, the regulations in 10 CFR 50.55a(f)(5)(ii) address what to do if a revised IST program for a facility conflicts with the TSs for the facility; they require the licensee to apply for an amendment to the TSs to conform the TSs to the revised program at least 6 months prior to the start of the period for which the provisions become applicable. Accordingly, there is no need for a TS stating how to address conflicts between the TSs and the IST program because the regulations specify how conflicts must be resolved.

Conclusion Regarding Deletion of TS 5.5.6

The NRC staff determined that the requirements currently in TS 5.5.6 are not necessary to assure operation of the facility in a safe manner. Based on this evaluation, the staff concludes that deletion of TS 5.5.6 from the licensee's TSs is acceptable because TS 5.5.6 is not required by 10 CFR 50.36(c)(5).

3.2 Definition of "INSERVICE TESTING PROGRAM" and Revision to SRs

The licensee proposes to revise the TS Definitions section to include the term, "INSERVICE TESTING PROGRAM," with the following definition: "The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f)." The proposed definition of the INSERVICE TESTING PROGRAM is consistent with the definition in TSTF-545, Revision 3. The definition is acceptable to the NRC staff because it correctly refers to the IST requirements in 10 CFR 50.55a(f).

The licensee requested that all existing references to the "Inservice Testing Program" in SRs be revised to "INSERVICE TESTING PROGRAM" to reference the new TS defined term in lieu of the deleted program. The proposed change is consistent with the intent of TSTF-545, Revision 3, to replace the current references in SRs with the new definition. The NRC staff verified that for each SR reference to the "Inservice Testing Program," the licensee proposed to change the reference to "INSERVICE TESTING PROGRAM." The proposed change does not alter how the SR testing is performed. However, the IST frequencies could change because the TSs will no longer include the more precise test frequencies in TS 5.5.6.a. As discussed in Section 3.1 of this safety evaluation, the staff determined that the TSs do not need to include the more precise testing frequencies currently in TS 5.5.6.a. Based on its review, the staff determined that revising the SRs to refer to the new definition is acceptable because these SRs will continue to be performed in accordance with the requirements of 10 CFR 50.55a(f). The staff also determined that, with the proposed changes that allow less-precise testing frequencies, 10 CFR 50.36(c)(3) will continue to be met because the SRs will continue to ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

3.3 Deviations from TSTF-545

In its application, the licensee identified the following deviations from TSTF-545, Revision 3:

1. TSTF-545, Revision 3, completely deletes TS 5.5.6 from the TSs and renumbers the subsequent TS programs. The licensee proposed to delete TS 5.5.6 from the Administrative Controls section of TSs, keep the title and add word "(Deleted)" next to the title, "Inservice Testing Inspection." The licensee also proposed to add the words "Note: See Section 1.1 for the definition of INSERVICE TESTING PROGRAM" after the title. The licensee did not propose to renumber the subsequent TS programs.

2. Some of the numbering and wording for SRs that are modified does not match TSTF-545, Revision 3. However, the licensee stated that the SRs are equivalent.

3. Some of the SRs modified in TSTF-545, Revision 3 are not applicable to the licensee.

4. The licensee's TS SR 3.6.1.6.2 is a plant-specific SR and therefore is not contained in STS. The licensee proposed to change SR 3.6.1.6.2's frequency from "Inservice Testing Program" to "INSERVICE TESTING PROGRAM."

The NRC staff finds that the proposed deviations are editorial in nature and the licensee's proposed TS changes remain consistent with the intent of TSTF-545, Revision 3. Therefore, the staff finds that the licensee's proposed TS changes are acceptable.

3.4 Changes to TS 5.5.2, "Primary Coolant Sources Outside Containment"

The licensee proposed to revise Browns Ferry TS 5.5.2 to incorporate the approved changes in TSTF-299, Revision 0. Specifically, the licensee requested to delete the words "refueling cycle intervals or less" and replace them with "least once per 24 months." The licensee also proposed to add the following statement after TS 5.5.2.b: "The provisions of SR 3.0.2 are applicable."

The revised TS 5.5.2.b will require integrated system leak testing at least once per 24 months in order to achieve the required fuel burn-up due to shutdowns and power reductions. Further, incorporating the allowance provided by SR 3.0.2 (25-percent frequency extension) to the integrated system leak test requirements, allows flexibility in scheduling that is inherent in the current requirement of "at refueling cycle interval or less." Without this allowance, a unit could be required to shutdown solely to perform an integrated system leak test in the event the refueling cycle interval is extended to achieve the required fuel burn-up.

The fixed testing frequency of "at least once every 24 months" is more precise than the current frequency of "at refueling cycle interval or less" and is consistent with similar requirements in the Browns Ferry TSs and the STSs. All three units are currently on a 24-month fuel cycle; therefore, adopting this more precise terminology is a clarification of the test frequency.

The NRC staff concludes that the licensee's proposed revision to the leak rate testing frequency is acceptable, because the change is a clarification and provides flexibility to perform the testing during refueling outages where the fuel cycle was extended due to a lengthy forced shutdown or operation at reduced power. The NRC staff concludes that the licensee's proposal to allow the 25-percent extension of the integrated leak testing frequency is acceptable because these

components are routinely inspected during normal operations and/or testing, such that any degradation should be apparent and corrective actions implemented. On this basis, the NRC staff concludes the proposed TS changes are acceptable and continue to meet 10 CFR 50.36(c)(3) and 10 CFR 50.36(c)(5).

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 24, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes SRs. 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 April 25, 2017 (82 FR 19106). 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 the 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.

6.0 REFERENCES

1. Letter from J. W. Shea, TVA, to NRC Document Control Desk, "Application to Revise Technical Specifications to Adopt TSTF-545, Rev. 3, 'TS Inservice Testing Program Removal & Clarify SR Usage Rule Application to Section 5.5 Testing,' to Request an Alternative to the ASME Code, and to Implement Administrative TSTF-299, Rev. 0, 'Administrative Controls Program 5.5.2.b Test Interval and Exception' (BFN-TS-495)" dated January 17, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17018A149).

2. Letter from TVA dated June 29, 2017, to NRC, "Application to Revise Technical Specifications to Adopt TSTF-545, Rev. 3, 'Administrative Changes to Proposed Revised Technical Specification Pages Related to Browns Ferry Nuclear Plant Application to Revise Technical Specifications to Adopt TSTF-545, Rev. 3, 'TS Inservice Testing Program Removal & Clarify SR Usage Rule Application to Section 5.5 Testing,' to Request an Alternative to the ASME Code, and to Implement Administrative TSTF-299, Rev. 0, 'Administrative Controls Program 5.5.2.b Test Interval and Exception'

(BFN-TS-495) (CAC Nos. MF9084, MF9085, MF9086)" (ADAMS Accession No. ML17180A158).

3. TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR Usage Rule Application to Section 5.5 Testing," dated October 21, 2015 (ADAMS Accession No. ML15294A555).

4. TSTF-299, Revision 0, "Administrative Controls Program 5.5.2.b Test Interval and Exception," October 31, 2000 (ADAMS Accession No. ML003775261).

5. NRC letter dated August 11, 2017, to TVA, "Browns Ferry Nuclear Plant, Units 1, 2, and 3 – Alternative Request No. IST-RR-1 for the Fourth 10-Year Inservice Testing Interval at Browns Ferry Nuclear Plant Units 1, 2, and 3 (CAC Nos. MF9087, MF9088, and MF9089)" (ADAMS Accession No. ML17145A552).

6. NRC letter to TSTF, "Final Model Safety Evaluation of Technical Specifications Task Force Traveler TSTF-545, Revision 3, "TS Inservice Testing Program Removal & Clarify SR Usage Rule Application to Section 5.5 Testing," dated December 11, 2015 (ADAMS Accession No. ML15314A365).

7. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 16, "Technical Specifications," Revision 3, dated March 2010 (ADAMS Accession No. ML100351425).

8. NUREG-1482, Revision 2, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants," final report, October 2013 (ADAMS Accession No. ML13295A020).

9. NUREG-0800, Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints," Revision 3, March 2007 (ADAMS Accession No. ML070720041).

10. ASME Code Case OMN-20, "Inservice Test Frequency," by letter dated August 11, 2017 (ADAMS Accession No. ML17145A552).

Principal Contributors: Caroline Tilton
John Huang

Date: November 8, 2017

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 - ISSUANCE OF AMENDMENTS REGARDING REQUEST TO ADOPT TSTF-545 AND TSTF-299 (CAC NOS. MF9084, MF9085, AND MF9086) (EPID L2017-LLA-0162) DATED NOVEMBER 8, 2017

DISTRIBUTION:
PUBLIC
RidsNrrDorlLpl2-2 Resource
RidsNrrPMBrownsFerry Resource
RidsNrrLABClayton Resource
RidsRgn2MailCenter Resource
RidsACRS_MailCTR Resource
RidsNrrDssStsb Resource
RidsNrrDeEmib Resource
JHuang, NRR
CTilton, NRR

ADAMS Accession No.: ML17277A207 * Via memorandum ** By email

OFFICE	DORL/LPL2-2/PM	DORL/LPL2-2/LA	DSS/STSB/BC(A)*	DE/EMIB/BC**
NAME	FSaba (AHon for)	BClayton	JWhitmann	SBailey
DATE	10/11/17	10/11/17	08/29/17	10/24/17
OFFICE	OGC /NLO with comments	DORL/LPL2-2/BC	DORL/LPL2-2/PM	
NAME	DRoth	UShoop (PBuckberg for)	FSaba	
DATE	10/23/17	11/08/17	11/08/17	

OFFICIAL RECORD COPY