

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

June 8, 2021

Mrs. Mandy Halter Vice President, Regulatory Assurance Entergy Services, LLC M-ECH-29 1340 Echelon Parkway Jackson, MS 39213

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 AND RIVER BEND STATION, UNIT 1 – ISSUANCE OF AMENDMENTS RE: REVISE TECHNICAL SPECIFICATIONS TO ADOPT TSTF-563, REVISION 0, "REVISE INSTRUMENT TESTING DEFINITIONS TO INCORPORATE THE SURVEILLANCE FREQUENCY CONTROL PROGRAM" (EPID L-2020-LLA-0205)

Dear Mrs. Halter:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued amendments consisting of changes to the Technical Specifications (TSs) in response to your application dated September 18, 2020, for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf) and River Bend Station, Unit 1 (River Bend). The following amendments are enclosed:

- Amendment No. 229 to Renewed Facility Operating License No. NPF-29 for Grand Gulf.
- Amendment No. 207 to Renewed Facility Operating License No. NPF-47 for River Bend.

The amendments change the TSs to revise the current instrumentation testing definitions of channel calibration and channel functional test to permit determination of the appropriate frequency to perform the surveillance requirement based on the devices being tested in each step. The proposed changes are based on Technical Specifications Task Force (TSTF) traveler TSTF-563, Revision 0, "Revise Instrument Testing Definitions to Incorporate the Surveillance Frequency Control Program," dated May 10, 2017. The NRC issued a final safety evaluation approving TSTF-563, Revision 0, on December 4, 2018.

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

Sincerely,

/**RA**/

Siva P. Lingam, Project Manager Plant Licensing Branch IV Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket Nos. 50-416 and 50-458

Enclosures:

- 1. Amendment No. 229 to NPF-29
- 2. Amendment No. 207 to NPF-47
- 3. Safety Evaluation

cc: Listserv



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

# ENTERGY OPERATIONS, INC.

## SYSTEM ENERGY RESOURCES, INC.

## COOPERATIVE ENERGY, A MISSISSIPPI ELECTRIC COOPERATIVE

## ENTERGY MISSISSIPPI, LLC

## DOCKET NO. 50-416

## GRAND GULF NUCLEAR STATION, UNIT 1

### AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 229 Renewed License No. NPF-29

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated September 18, 2020, 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. NPF-29 is hereby amended to read as follows:
  - (2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 229 are hereby incorporated into this renewed license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days from the date of issuance.

## FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity, Chief Plant Licensing Branch IV Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to Renewed Facility Operating License No. NPF-29 and the Technical Specifications

Date of Issuance: June 8, 2021

## ATTACHMENT TO LICENSE AMENDMENT NO. 229

### RENEWED FACILITY OPERATING LICENSE NO. NPF-29

### **GRAND GULF NUCLEAR STATION, UNIT 1**

## DOCKET NO. 50-416

Replace the following pages of Renewed Facility Operating License No. NPF-29 and the Appendix A, Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

### Renewed Facility Operating License

<u>REMOVE</u>	INSERT
-4-	-4-

### **Technical Specifications**

<u>REMOVE</u>	INSERT
1.0-1	1.0-1
1.0-2	1.0-2

amended, are fully applicable to the lessors and any successors in interest to those lessors, as long as the renewed license of GGNS Unit 1 remains in effect.

- (b) SERI is required to notify the NRC in writing prior to any change in (i) the terms or conditions of any new or existing sale or lease agreements executed as part of the above authorized financial transactions, (ii) the GGNS Unit 1 operating agreement, (iii) the existing property insurance coverage for GGNS Unit 1 that would materially alter the representations and conditions set forth in the Staff's Safety Evaluation Report dated December 19, 1988 attached to Amendment No. 54. In addition, SERI is required to notify the NRC of any action by a lessor or other successor in interest to SERI that may have an effect on the operation of the facility.
- C. The renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
  - (1) <u>Maximum Power Level</u>

Entergy Operations, Inc. is authorized to operate the facility at reactor core power levels not in excess of 4408 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 229 are hereby incorporated into this renewed license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

During Cycle 19, GGNS will conduct monitoring of the Oscillation Power Range Monitor (OPRM). During this time, the OPRM Upscale function (Function 2.f of Technical Specification Table 3.3.1.1-1) will be disabled and operated in an "indicate only" mode and technical specification requirements will not apply to this function. During such time, Backup Stability Protection measures will be implemented via GGNS procedures to provide an alternate method to detect and suppress reactor core thermal hydraulic instability oscillations. Once monitoring has been successfully completed, the OPRM Upscale function will be enabled and technical specification requirements will be applied to the function; no further operating with this function in an "indicate only" mode will be conducted.

# 1.0 USE AND APPLICATION

## 1.1 Definitions

NOTE		
The defined terms of this section Technical Specifications and Bas	appear in capitalized type and are applicable throughout these ses.	
Term	Definition	
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.	
AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	The APLHGR shall be applicable to a specific planar height and is equal to the sum of the LHGRs for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.	
CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel, including the required sensor, alarm, display, and trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step, so that the entire channel is calibrated.	
CHANNEL CHECK	A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.	

(continued)

CHANNEL FUNCTIONAL TEST	A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including required alarm, interlock, display, and trip functions, and channel failure trips. The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step, so that the entire channel is tested.	
CORE ALTERATION	CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:	
	a. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement); and	
	b. Control rod movement provided there are no fuel assemblies in the associated core cell.	
	Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.	
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	

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

## ENTERGY LOUISIANA, LLC

## <u>AND</u>

## ENTERGY OPERATIONS, INC.

## DOCKET NO. 50-458

## **RIVER BEND STATION, UNIT 1**

### AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 207 License No. NPF-47

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated September 18, 2020, 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, as amended, 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. NPF-47 is hereby amended to read as follows:
  - (2) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A, as revised through Amendment No. 207 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer L. Dixon-Herrity, Chief Plant Licensing Branch IV Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Attachment: Changes to Renewed Facility Operating License No. NPF-47 and the Technical Specifications

Date of Issuance: June 8, 2021

## ATTACHMENT TO LICENSE AMENDMENT NO. 207

### RENEWED FACILITY OPERATING LICENSE NO. NPF-47

### **RIVER BEND STATION, UNIT 1**

## DOCKET NO. 50-458

Replace the following pages of the Renewed Facility Operating License No. NPF-47 and the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change.

### Renewed Facility Operating License

<u>REMOVE</u>	INSERT
-3-	-3-

### **Technical Specifications**

<u>REMOVE</u>	INSERT
1.0-1	1.0-1
1.0-2	1.0-2

- (2) EOI, pursuant to Section 103 of the Act and 10 CFR Part 50, to possess, use and operate the facility at the above designated location in accordance with the procedures and limitations set forth in this renewed license;
- (3) EOI, pursuant to Section 103 of the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
- (4) EOI, pursuant to Section 103 of 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;
- (5) EOI, pursuant to Section 103 of 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 instrument calibration or associated with radioactive apparatus or components; and
- (6) EOI, pursuant to Section 103 of the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and 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) <u>Maximum Power Level</u>

EOI is authorized to operate the facility at reactor core power levels not in excess of 3091 megawatts thermal (100% rated power) in accordance with the conditions specified herein.

(2) <u>Technical Specifications and Environmental Protection Plan</u>

The Technical Specifications contained in Appendix A, as revised through Amendment No. 207 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

# 1.0 USE AND APPLICATION

### 1.1 Definitions

NOTENOTE		
The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.		
<u>Term</u>	Definition	
ACTIONS	ACTIONS shall be that part of a Specification that prescribe Required Actions to be taken under designated Conditions within specified Completion Times.	
AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)	The APLHGR shall be applicable to a specific planar height and is equal to the sum of the LHGRs for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle.	
CHANNEL CALIBRATION	A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel, including the required sensor, alarm, display, and trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step, so that the entire channel is calibrated.	
CHANNEL CHECK	A CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter.	

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CHANNEL FUNCTIONAL TEST	A CHANNEL FUNCTIONAL TEST shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including required alarm, interlock, display, and trip functions, and channel failure trips. The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step, so that the entire channel is tested.		
CORE ALTERATION	CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. The following exceptions are not considered to be CORE ALTERATIONS:		
	a. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement); and		
	b. Control rod movement provided there are no fuel assemblies in the associated core cell.		
	Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.		
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 Federal Guidance Report (FGR) 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1989.		

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

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

## RELATED TO AMENDMENT NO. 229 TO

### RENEWED FACILITY OPERATING LICENSE NO. NPF-29 AND AMENDMENT NO. 207 TO

## RENEWED FACILITY OPERATING LICENSE NO. NPF-47

## ENTERGY OPERATIONS, INC.

## **GRAND GULF NUCLEAR STATION, UNIT 1**

## **RIVER BEND STATION, UNIT 1**

## DOCKET NOS. 50-416 AND 50-458

## 1.0 INTRODUCTION

By letter dated September 18, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20262H225), Entergy Operations, Inc. (the licensee) requested changes to the Technical Specifications (TSs) for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf), and River Bend Station, Unit 1 (River Bend).

The amendments would revise the current instrumentation testing definitions of channel calibration and channel functional test to permit determination of the appropriate frequency to perform the surveillance requirement (SR) based on the devices being tested in each step. The changes to the TSs are based on Technical Specifications Task Force (TSTF) traveler TSTF-563, Revision 0, "Revise Instrument Testing Definitions to Incorporate the Surveillance Frequency Control Program," dated May 10, 2017 (ADAMS Accession No. ML17130A819), for Grand Gulf and River Bend. The U.S. Nuclear Regulatory Commission (NRC) issued a final safety evaluation (SE) approving TSTF-563, Revision 0, on December 4, 2018 (ADAMS Accession No. ML18333A152).

A Surveillance Frequency Control Program (SFCP) was incorporated into the Grand Gulf TSs in Amendment No. 219, dated June 11, 2019 (ADAMS Accession No. ML19094A799), and into the River Bend TSs in Amendment No. 196, dated April 29, 2019 (ADAMS Accession No. ML19066A008).

The licensee is not proposing any variations from the TS changes described in TSTF-563 or the applicable parts of the associated NRC SE. However, the current Grand Gulf and River Bend TS definitions for Channel Calibration and Channel Functional Test differ slightly from the definitions in NUREG-1434, Revision 4.0, "Standard Technical Specifications, General Electric BWR [Boiling Water Reactors]/6 Plants," Volume 1, "Specifications," dated April 2012 (i.e., the basis for TSTF-563) (ADAMS Accession No. ML12104A195).

## 2.0 REGULATORY EVALUATION

## 2.1 Description of Surveillance Frequency Control Program and Instrument Testing

The TSs require the surveillances for instrumentation channels to be performed within the specified frequency, using any series of sequential, overlapping, or total channel steps. Prior amendments approved by the NRC dated June 11, 2019 and April 29, 2019, for Grand Gulf and River Bend, respectively, revised their TSs to relocate all periodic surveillance frequencies to a licensee-controlled program. Changes to the relocated surveillance frequencies are made in accordance with the TS program referred to as the SFCP. The SFCP allows a new surveillance frequency to be determined for the channel, but that frequency must consider all components in the channel and applies to the entire channel.

A typical instrument channel consists of many different components, such as sensors, rack modules, and indicators. These components have different short-term and long-term performance (drift) characteristics, resulting in the potential for different calibration frequency requirements. Under the current TSs, the most limiting component calibration frequency for the channel must be chosen when a revised frequency is considered under the SFCP. As a result, all components that makeup a channel must be calibrated at a frequency equal to the channel component with the shortest (i.e., most frequent) surveillance frequency.

Some channel components, such as pressure transmitters, are very stable with respect to drift and could support a substantially longer calibration frequency than the other components in the channel. Currently, the SRs in many plants are performed in steps (e.g., a pressure sensor or transmitter is calibrated during a refueling outage, and the rack signal conditioning modules are calibrated while operating at power). The proposed change extends this concept to permit the surveillance frequency of each step to be determined under the SFCP based on the component(s) surveilled in the step instead of all components in the channel. This will allow each component to be tested at the appropriate frequency based on the component's long-term performance characteristics.

Allowing an appropriate surveillance frequency for performing a channel calibration on each component or group of components could reduce radiation dose associated with inplace calibration of sensors, reduce wear on equipment, reduce unnecessary burden on plant staff, and reduce opportunities for calibration errors.

## 2.2 <u>Proposed Changes to the Technical Specifications</u>

Currently, the channel calibration and channel functional test may be performed by any series of sequential, overlapping, or total channel steps. The proposed changes to the TSs would revise the definitions of channel calibration and channel functional test to indicate that the step must be performed within the most limiting frequency for the components included in that step by adding the phrase ", and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step," in the last sentence of each definition.

The following paragraph denotes the changes to the channel calibration definition for Grand Gulf and River Bend. Changes are shown in *bold italics*:

A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel, including the required sensor, alarm, display, and trip functions, and shall include the CHANNEL FUNCTIONAL TEST. Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step, so that the entire channel is calibrated.

The following paragraph denotes the changes to the channel functional test definition for Grand Gulf and River Bend. Changes are shown in *bold italics*:

...The CHANNEL FUNCTIONAL TEST may be performed by means of any series of sequential, overlapping, or total channel steps, **and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step,** so that the entire channel is tested.

The various instrumentation functions in the TSs require surveillances to verify the correct functioning of the instrument channel. The proposed changes would revise the definitions above to permit the surveillance frequency of each step to be determined under the SFCP based on the component(s) surveilled in the step instead of all components in the channel. This will allow each component to be tested at the appropriate frequency based on the component's long-term performance characteristics.

The proposed changes would also allow the licensee to control the frequency of associated components being tested in each step. The SR for the overall instrumentation channel remains unchanged. The proposed change would have no effect on the design, fabrication, use, or methods of testing, of the instrumentation channels, and will not affect the ability of the instrumentation to perform the functions assumed in the safety analysis.

These instrumentation testing definitions would state that "The [test type] may be performed by means of any series of sequential, overlapping, or total channel steps." The surveillance frequency of these subsets would be established based on the characteristics of the components in the step rather than the most limiting component characteristics in the entire channel. Each of these steps would be evaluated in accordance with the SFCP.

### 2.2.1 Variations from TSTF-563

The Grand Gulf and River Bend TS definitions explicitly name the components in a channel that are required for channel Operability (i.e., the required sensor, alarm, display, and trip functions). The same definitions in NUREG-1434 only refer to the collective term "all devices." In addition, the Grand Gulf and River Bend TS definitions include the qualifying phrase: "...so that the

entire channel is tested," in reference to test performance "....by means of any series of sequential, overlapping, or total channel steps."

### 2.3 Applicable Regulatory Requirements and Guidance

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(a)(1) requires each applicant for a license authorizing operation of a utilization facility to include the proposed TSs in the application.

The regulation at 10 CFR 50.36(b) requires:

Each license authorizing operation of a production or utilization facility of a type described in § 50.21 or § 50.22 will include technical specifications. The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to § 50.34 ["Contents of applications; technical information"]. The Commission may include such additional technical specifications as the Commission finds appropriate.

The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). One such category is SRs. SRs are defined in 10 CFR 50.36(c)(3) as "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."

Prior Grand Gulf and River Bend amendments approved by the NRC on June 11, 2019, and April 29, 2019, respectively, replaced specific surveillance frequencies with references to an SFCP required by Grand Gulf TS 5.5.6 and River Bend TS 5.5.12. TS 5.5.6 for Grand Gulf and TS 5.5.12 for River Bend require the licensee to establish, implement, and maintain an SFCP to ensure that TS SRs are performed at intervals listed in, and controlled by, the SFCP. Grand Gulf TS 5.5.6 and River Bend TS 5.5.12 also require that changes to the surveillance frequencies listed in the SFCP be made in accordance with NRC staff approved Topical Report (TR) Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk Informed Method for Control of Surveillance Frequencies, Industry Guidance Document," dated April 2007 (ADAMS Accession No. ML071360456).

TR NEI 04-10, Revision 1, describes an evaluation process and a multi-disciplinary plant decisionmaking panel that considers the detailed evaluation of proposed surveillance frequency revisions. The evaluations are based on operating experience, test history, manufacturers' recommendations, codes and standards, and other deterministic factors, in conjunction with risk insights. The evaluation considers all components being tested by the SR. Process elements are included for determining the cumulative risk impact of the changes, updating the licensee's probabilistic risk assessment (PRA) models, and for imposing corrective actions, if necessary, following implementation of a revised frequency.

The NRC staff's guidance for the review of TSs is in Chapter 16.0, Revision 3 "Technical Specifications," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP), dated March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared Standard Technical Specifications (STS) for each of the LWR nuclear designs. Accordingly, the NRC staff's review includes

consideration of whether the proposed changes are consistent with the applicable reference STS (i.e., the current STS), as modified by NRC-approved TSTF travelers. In addition, the guidance states that comparing the change to previous STS can help clarify the intent of the TSs.

Regulatory Guide (RG) 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated May 2011 (ADAMS Accession No. ML100910006), describes an acceptable risk-informed approach for assessing the nature and impact of proposed permanent licensing basis changes by considering engineering issues and applying risk insights. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated May 2011 (ADAMS Accession No. ML100910008), describes an acceptable risk-informed approach specifically for assessing proposed TS changes.

RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," dated March 2009 (ADAMS Accession No. ML090410014), describes an acceptable approach for determining the technical adequacy of PRAs.

The NRC staff's guidance for evaluating the technical basis for proposed risk-informed changes is provided in SRP, Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," dated June 2007 (ADAMS Accession No. ML071700658). The NRC staff's guidance for evaluating PRA technical adequacy is provided in SRP, Section 19.1, Revision 3, "Determining the Technical Adequacy of Probabilistic Risk Assessment for Risk-Informed License Amendment Requests After Initial Fuel Load," dated September 2012 (ADAMS Accession No. ML12193A107). More specific guidance related to risk-informed TS changes is provided in SRP, Section 16.1, Revision 1, "Risk-Informed Decision Making: Technical Specifications," dated March 2007 (ADAMS Accession No. ML070380228), which includes changes to surveillance test intervals (STIs) (i.e., surveillance frequencies) as part of risk-informed decisionmaking. Section 19.2 of the SRP references the same criteria as RG 1.177, Revision 1, and RG 1.174, Revision 2, and states that a risk-informed application should be evaluated to ensure that the proposed changes meet the following key principles:

- The proposed change meets the current regulations, unless it explicitly relates to a requested exemption or rule change.
- The proposed change is consistent with the defense-in-depth philosophy.
- The proposed change maintains sufficient safety margins.
- When proposed changes result in an increase in risk associated with core damage frequency or large early release frequency, the increase(s) should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.
- The impact of the proposed change should be monitored using performance measurement strategies.

The STS applicable to the proposed changes are provided in NUREG-1434.

### 3.0 TECHNICAL EVALUATION

### 3.1 Review of the Proposed Changes

Revising the frequency of a channel calibration and channel functional test instrument channel under the SFCP requires assurance that component performance characteristics, such as drift between each test, will not result in undetected instrument errors that exceed the assumptions of the safety analysis and supporting instrument loop uncertainty calculations. These requirements are consistent with the methodology described in TR NEI 04-10, which is required by the SFCP. The SFCP does not permit changes to the TS allowable values or nominal trip setpoints; but allows only the surveillance frequency to be changed when determined permissible by TR NEI 04-10. Therefore, prior to extending the test intervals for an instrument channel component or components associated with a given calibration step, the component performance characteristics must be evaluated to verify the allowable value or nominal trip setpoint will still be valid and to establish a firm technical basis supporting the extension. In addition, each change must be reviewed by the licensee to ensure the applicable uncertainty allowances are conservative (bounding) (e.g., sensor drift, rack drift, indicator drift). Documentation to support the changes can be retained per the guidance in TR NEI 04-10.

Five key safety principles that must be evaluated before changing any surveillance frequency are identified in Section 3.0 of TR NEI 04-10. Principle 3 requires confirmation of the maintenance of safety margins, which, in this case, includes performance of deterministic evaluations to verify preservation of instrumentation trip setpoint and indication safety margins.

The evaluation methodology specified in TR NEI 04-10 also requires consideration of common-cause failure effects and monitoring of the instrument channel component performance following the frequency change to ensure that channel performance is consistent with the analysis to support an extended frequency.

The method of evaluating a proposed surveillance frequency change is not dependent on the number of components in the channel. Each step needs to be evaluated to determine the acceptable surveillance frequency for that step. The proposed change to permit changing the surveillance frequency of channel component(s) does not affect the test method or evaluation method. The requirement to perform a channel calibration or channel functional test on the entire channel is not changed.

For example, an evaluation in accordance with TR NEI 04-10 may determine that a field sensor (e.g., a transmitter) should be calibrated every 48 months, that the rack modules should be calibrated every 30 months, and that the indicators should be calibrated every 24 months. Under the current TS requirements, all devices in the channel must be calibrated every 24 months. However, under the proposed change, sensors, rack modules, and indicators would be calibrated at the appropriate frequency for the tested devices. As required by the channel calibration definition, the test would still encompass all devices in the channel required for channel operability.

Per Grand Gulf TS 5.5.6 and River Bend TS 5.5.12, TR NEI 04-10 methodology must be used to evaluate surveillance frequency changes to determine if such SR extensions could be applied. Process elements are used to determine the cumulative risk impact of changes, update the PRA, and impose corrective actions, if needed, following implementation. Several

steps are required by TR NEI 04-10, Section 4.0, Step 7, to be evaluated prior to determining the acceptability of changes. These steps include history of surveillance tests, industry and plant specific history, impact on defense-in-depth, vendor recommendations, required test frequencies for the applicable codes and standards, ensuring that plant licensing basis would not be invalidated and other factors. The NRC staff finds these measures acceptable in determining the SR extensions.

In addition, TR NEI 04-10, Section 4.0, Step 16, requires an independent decisionmaking panel to review the cumulative impact of all STI changes over a period of time. This is also specified by RGs 1.174 and 1.177. The independent decisionmaking panel is composed of the site Maintenance Rule expert panel, surveillance test coordinator, and subject matter expert who is a cognizant system manager or component engineer. Based on the above information, the NRC staff finds that the setpoint changes will be tracked in an acceptable manner.

Licensees with an SFCP may currently revise the surveillance frequency of instrumentation channels. The testing of these channels may be performed by means of any series, sequential, overlapping, or total channel steps. However, all required components in the instrumentation channel must be tested for the entire channel to be considered operable.

The NRC staff notes that industry practice is to perform instrument channel surveillances, such as channel calibrations and channel functional tests, using separate procedures based on the location of the components. Each of these procedures may be considered a "step." The results of all these procedures are used to satisfy the SRs using the existing allowance to perform it "by means of any series of sequential, overlapping, or total channel steps." The proposed changes would allow for determining an acceptable surveillance frequency for each step.

The NRC staff notes that the NEI 04-10 methodology includes the determination of whether the structures, systems, and components (SSCs) affected by a proposed change to a surveillance frequency are modeled in the PRA. Where the SSC is directly or implicitly modeled, a quantitative evaluation of the risk impact may be carried out. The methodology adjusts the failure probability of the impacted SSCs based on the proposed change to the surveillance frequency. Where the SSC is not modeled in the PRA, bounding analyses are performed to characterize the impact of the proposed change to the surveillance frequency. Potential impacts on the risk analyses due to screening criteria and truncation levels are addressed by the requirements for PRA technical adequacy, consistent with the guidance contained in RG 1.200, and by sensitivity studies identified in TR NEI 04-10. The licensee is not proposing to change the methodology, or the acceptance criteria for extending STIs, and licensee will need to evaluate changes in the frequency for performing each of the steps in the instrumentation surveillance test per the methodology in TR NEI 04-10.

Therefore, the NRC staff concludes that the proposed change to determine the test frequency for individual steps within instrumentation channel surveillance tests is acceptable because any extended STIs will be developed within the established constraints of the SFCP and TR NEI 04-10.

The regulatory requirements in 10 CFR 50.36 are not specific regarding the frequency of performing surveillance tests. The proposed change only affects the frequency of performance and does not affect the surveillance testing method or acceptance criteria. Therefore, the proposed change is consistent with the surveillance testing requirements of 10 CFR 50.36.

### 3.2 PRA Acceptability

The guidance in RG 1.200 states that the quality of a licensee's PRA should be commensurate with the safety significance of the proposed TS change and the role the PRA plays in justifying the change. That is, the greater the change in risk or the greater the uncertainty in that risk as a result of the requested TS change, or both, the more rigor that should go into ensuring the quality of the PRA.

The NRC staff has performed an assessment of the PRA models used to support the approved SFCP that uses TR NEI 04-10, using the guidance of RG 1.200 to assure that the PRA models are capable of determining the change in risk due to changes to surveillance frequencies of SSCs, using plant-specific data and models. Capability Category II of the NRC-endorsed PRA standard is the target capability level for supporting requirements for the internal events PRA for this application. Any identified deficiencies to those requirements are assessed further to determine any impacts to proposed decreases to surveillance frequencies, including the use of sensitivity studies, where appropriate, in accordance with TR NEI 04-10.

The SFCP permits revising of the surveillance frequency for instrumentation channels. The NRC staff evaluated whether TR NEI 04-10 can be applied to subsets in an instrument channel when the SFCP currently specifies a surveillance interval that is applied to the entire channel. The NRC staff notes that the current channel surveillance may be performed by means of any series of sequential, overlapping, or total channel steps. In practice, this means that a channel is divided into subsets, and each subset is tested separately. Therefore, the current instrument channel testing is already composed of a sequence of individual tests.

The instrument function may be modeled in the PRA differently depending on the site and the function (e.g., channel may be modeled individually, subsets may be modeled, or the channel function may be modeled as a single entity). There are different steps through the evaluation methodology in TR NEI 04-10 that could be used based on the different PRA modeling approaches. The appropriate modeling of these different approaches is included in the NRC staff's review of the PRA modeling during the review of the application to implement an SFCP that uses TR NEI 04-10.

The PRA in use at Grand Gulf and River Bend is the same as that used to support the license amendments that authorized the SFCP and follows TR NEI 04-10. Currently, the TSs allow the licensee to change the surveillance frequency of an entire channel under the SFCP. The proposed amendments would allow the licensee to change the surveillance frequency of each subset of the channel. The NRC staff finds that changes to the surveillance frequency caused by defining and using individual, testable component subsets can be appropriately evaluated with the current SFCP and the current PRAs. The NRC staff also finds that the risk-informed methodology review and the PRA acceptability review that were performed during the review of the application for amendments authorizing the SFCP that uses TR NEI 04-10 are adequate.

The regulations at 10 CFR 50.36(c)(3) require that TSs include items in specified categories, including SRs. The proposed changes modify the definitions applicable to instrumentation channel components but do not alter the previously approved technical approach in TR NEI 04-10. Thus, the TSs, as revised, continue to specify the appropriate SRs for tests and inspections to ensure the necessary quality of affected SSCs is maintained, ensure facility operation within safety limits, and ensure limiting conditions for operation are met.

Additionally, the NRC staff finds the proposed TS changes to be technically clear and consistent with customary terminology and format in accordance with SRP Chapter 16.0. The NRC staff reviewed the proposed changes against the regulations and concludes that the changes continue to meet the requirements of Section 50.36(c)(3) of 10 CFR, for the reasons discussed above, and thus provide reasonable assurance that the revised TSs provide the requisite requirements and controls for the facility to operate safely. Therefore, the NRC staff concludes that the proposed TS changes are acceptable.

## 3.3 Variations From TSTF-563

The licensee described variations from TSTF-563 in Section 2.2 of the licensee's letter dated September 18, 2020. The current Grand Gulf and River Bend TS definitions for Channel Calibration and Channel Functional Test differ slightly from the definitions in NUREG-1434. Specifically, the Grand Gulf and River Bend TS definitions explicitly name the components in a channel that are required for channel OPERABILITY (i.e., the required sensor, alarm, display, and trip functions). The same definitions in NUREG-1434 only refer to the collective term "all devices." In addition, the Grand Gulf and River Bend TS definitions include the qualifying phrase: "…so that the entire channel is tested," in reference to test performance "….by means of any series of sequential, overlapping, or total channel steps."

The NRC staff reviewed the differences from the NUREG-1434 definitions and determined that these differences are editorial in nature and continue to meet the intent of TSTF-563 for both Grand Gulf and River Bend.

## 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi and Louisiana officials were notified of the proposed issuance of the amendments on May 24, 2021. The State officials had no comments.

# 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted areas as defined in 10 CFR Part 20 and change 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, published in the *Federal Register* on November 3, 2020 (85 FR 69655), and there has been no public comment on such finding. 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 <u>CONCLUSION</u>

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

Principal Contributor: Tarico Sweat, NRR

Date: June 8, 2021

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 AND RIVER BEND STATION, UNIT 1 – ISSUANCE OF AMENDMENTS RE: REVISE TECHNICAL SPECIFICATIONS TO ADOPT TSTF-563, REVISION 0, "REVISE INSTRUMENT TESTING DEFINITIONS TO INCORPORATE THE SURVEILLANCE FREQUENCY CONTROL PROGRAM" (EPID L-2020-LLA-0205) DATED JUNE 8, 2021

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