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

January 6, 2020

Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – ISSUANCE OF AMENDMENT NO. 223 TO REVISE TECHNICAL SPECIFICATION (TS) 3.3.1.1, "REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION," AND TS 3.3.4.1, "END OF CYCLE RECIRCULATION PUMP TRIP (EOC-RPT) INSTRUMENTATION" (EPID L-2019-LLA-0007)

Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 223 to Renewed Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1. The amendment consists of changes to the technical specifications (TSs) in response to your application dated January 23, 2019, as supplemented by letter dated June 13, 2019.

The amendment revises TS 3.3.1.1, "Recirculation Protection System (RPS) Instrumentation," and TS 3.3.4.1, "End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation." The proposed change revises the allowable value for the turbine stop valve closure trip oil pressure function and turbine control valve fast closure trip oil pressure function. Additionally, the amendment adds new Notes to assess channel performance during testing that verifies instrument channel setting values established by Entergy Operations, Inc. setpoint methodology.

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

Sincerely,

Siva P. Lingam

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

Docket No. 50-416

Enclosure:
1. Amendment No. 223 to NPF-29
2. 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. 223
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 January 23, 2019, as supplemented by letter dated June 13, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and section 2.C.(2) of Renewed Facility Operating License No. NPF-29 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 223 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 the Renewed Facility
Operating License No. NPF-29 and
the Technical Specifications

Date of Issuance: January 6, 2020

ATTACHMENT TO LICENSE AMENDMENT NO. 223

RENEWED FACILITY OPERATING LICENSE NO. NPF-29

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

Replace the following pages of the 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

Remove	Insert
4	4

Technical Specifications

REMOVE	INSERT
3.3-8	3.3-8
3.3-27	3.3-27
----	3.3-27a

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) Maximum Power Level

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) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 223 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.

Table 3.3.1.1-1 (page 4 of 4)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
8.	Scram Discharge Volume Water Level - High (continued)					
	b. Float Switch	1,2	2	H	SR 3.3.1.1.8 SR 3.3.1.1.12 SR 3.3.1.1.13	≤ 65 inches
		5[(a)]	2	I	SR 3.3.1.1.8 SR 3.3.1.1.12 SR 3.3.1.1.13	≤ 65 inches
9.	Turbine Stop Valve Closure Trip Oil Pressure - Low	≥ 35.4% RTP	4	E	SR 3.3.1.1.8 SR 3.3.1.1.9 (c)(d) SR 3.3.1.1.12 (c)(d) SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 644 psig
10.	Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≥ 35.4% RTP	2	E	SR 3.3.1.1.8 SR 3.3.1.1.9 (c)(d) SR 3.3.1.1.12 (c)(d) SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 938 psig
11.	Reactor Mode Switch -Shutdown Position	1,2	2	H	SR 3.3.1.1.11 SR 3.3.1.1.13	NA
		5[(a)]	2	I	SR 3.3.1.1.11 SR 3.3.1.1.13	NA
12.	Manual Scram	1,2	2	H	SR 3.3.1.1.4 SR 3.3.1.1.13	NA
		5[(a)]	2	I	SR 3.3.1.1.4 SR 3.3.1.1.13	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.
(c) If the as-found channel setpoint is outside its pre-defined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
(d) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in the Technical Requirements Manual.

SURVEILLANCE REQUIREMENTS

----------NOTE----------

When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.2	----------NOTES---------- 1. If the as-found channel setpoint is outside its pre-defined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 2. The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in the Technical Requirements Manual. ---------- Calibrate the trip units.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.4.1.3	----------NOTES---------- 1. If the as-found channel setpoint is outside its pre-defined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 2. The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in the Technical Requirements Manual. ---------- Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. TSV Closure, Trip Oil Pressure - Low: ≥ 644 psig. b. TCV Fast Closure, Trip Oil Pressure -Low: ≥ 938 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.4	Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation.	In accordance with the Surveillance Frequency Control Program
SR 3.3.4.1.5	Verify TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ 35.4% RTP.	In accordance with the Surveillance Frequency Control Program

(continued)

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 223 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-29

ENTERGY OPERATIONS, INC., ET AL.

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

1.0 INTRODUCTION

By letter dated January 23, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19023A555), as supplemented by letter dated June 13, 2019 (ADAMS Accession No. ML19164A281), Entergy Operations, Inc. (Entergy, the licensee) submitted a license amendment request (LAR) for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf or GGNS) to revise Technical Specification (TS) Section 3.3, "Instrumentation."

The proposed amendment would revise:

- TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," as follows:

  Allowable Values (AV) of Function 9, "Turbine Stop Valve Closure Trip Oil Pressure - Low," and Function 10, "Turbine Control Valve Fast Closure, Trip Oil Pressure - Low," in TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation"; and add new Notes (c) and (d)[1] for Surveillance Requirement (SR) 3.3.1.1.9 and SR 3.3.1.1.12.

- TS 3.3.4.1, "End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation," as follows:

  SR 3.3.4.1.3, in accordance with the proposed AVs of Functions 9 and 10 in TS Table 3.3.1.1-1; and add new NOTES 1 and 2 for SR 3.3.4.1.2 and SR 3.3.4.1.3 to assess channel performance during testing that verifies instrument channel setting value established by the Entergy setpoint methodology.

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[1] Changed from Notes (d) and (e), as submitted in the LAR, to Notes (c) and (d) to reflect the changes that were made in Amendment No. 219, dated June 11, 2019 (ADAMS Accession No. ML19094A799).

The proposed change to the TSs is necessary due to the replacement of the pressure transmitters that sense electrohydraulic control (EHC) system pressure and provide signals to the RPS. The licensee is replacing the pressure transmitters in conjunction with the upgrade of the turbine control system that includes changing the EHC system from a low pressure system to a high pressure system. Revision of the AV is needed because of higher operating pressure of the upgraded EHC system. Pressure transmitters are being replaced to accommodate modification to the EHC system while maintaining the function of transmitting the trip signal to the RPS.

This amendment will also incorporate Technical Specifications Task Force (TSTF) traveler TSTF-493-A, Revision 4, "Clarify Application of Setpoint Methodology for LSSS [Limiting Safety System Setting] Functions," Option A, for the affected turbine trip on low fluid oil pressure function setpoints only. There were no variations in the LAR from the TSTF.

The U.S. Nuclear Regulatory Commission (NRC or Commission) staff evaluated the revision to TS Table 3.3.1.1-1, regarding the AV of Functions 9 and 10, and SRs in accordance with the proposed AV of Functions 9 and 10.

The supplemental letter dated June 13, 2019, 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 March 12, 2019 (84 FR 8910).

2.0 REGULATORY EVALUATION

2.1 System Description

The RPS instrumentation is a set of nuclear safety components in a nuclear power plant, designed to assure safe operation of the reactor. The purpose of this system is to monitor critical plant parameters during all plant operating modes and initiate a reactor scram when the LSSS is reached. The Grand Gulf TSs define the limiting safety system setpoints on these parameters to prevent violations of the safety limits (SLs). The RPS can trip automatically (scram), or it can be tripped by the operators when the parameters exceed the limit setpoints. Reactor scrams are initiated by the neutron monitoring system variables (i.e., nuclear system high pressure, turbine stop valve (TSV) closure, turbine control valve (TCV) fast closure, main steam line isolation valve closure, and reactor vessel low water level) to prevent fuel damage in case of abnormal operational transients. Specifically, these process parameters initiate a scram in time to prevent the core from exceeding thermal-hydraulic SLs during abnormal operational transients.

Two conditions which initiate reactor scram are TSV closure and TCV fast closure when reactor power is above a preselected percent of rated power. These functions in Grand Gulf must be enabled at thermal power greater than or equal to (≥) 35.4 percent rated thermal power (RTP).

In Section 2.1, "System Design and Operation" of the licensee's LAR dated January 23, 2019, the licensee described the functions TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low (Grand Gulf TS Table 3.3.1.1-1, Functions 9 and 10). These functions anticipate the loss of heat removal capabilities that produce high reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated at the start of TSV closure and on TCV fast closure in anticipation of the transients that would result from the closure of these valves. These trip functions act to reduce the amount of energy

required to be absorbed and along with the actions of the EOC-RPT system, and ensure that the minimum critical power ratio SL is not exceeded.

2.1.1 Existing Pressure Switch Configuration

The RPS consists of two independent trip systems (i.e., A and B), with two logic channels in each trip system (i.e., logic channels A1 and A2, B1 and B2). The outputs of these logic channels in a trip system are combined in a one-out-of-two logic so either channel can trip the associated trip system. The tripping of both trip systems will produce a reactor scram. The arrangement of this logic is referred to as one-out-of-two taken twice logic.

Closure of the TSVs and fast closure of the TCVs will result in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated at the start of TSV closure and/or TCVs fast closure in anticipation of the transients that would result from the closure of these valves by the EHC fluid pressure at each stop valve.

TSV Closure, Trip Oil Pressure - Low signals are provided from eight sensors that sense stop valve motion away from full-open position, such that, detection of motion is made before the stop valves close more than 10 percent from full open. Two independent pressure transmitters are associated with each stop valve. Each of the two independent pressure transmitters provide redundant inputs to each RPS trip system. Therefore, each RPS trip system receives an input from four TSV Closure, Trip Oil Pressure - Low channels, each consisting of one pressure transmitter. These signals initiate a reactor trip on a turbine trip if reactor power is ≥ 35.4 percent RTP.

TCV Fast Closure, Trip Oil Pressure - Low AV is selected high enough to detect approaching TCV fast closure. Four channels of TCV Fast Closure, Trip Oil Pressure-Low Function, with two channels in each trip system arranged in a one-out-of-two logic are required to be operable to ensure no single instrument failure will preclude a scram from this function. This function is required for turbine trip whenever thermal power is ≥ 35.4 percent RTP.

The tripping of both TSV and TCV trip systems will produce a reactor scram.

2.1.2 Reason for the Proposed Changes

In the original LAR and its supplemental letter dated June 13, 2019, the licensee proposed TS changes due to the modification of the pressure transmitters that sense EHC system pressure for the TSVs and TCVs and provide signals to the RPS. The EHC system pressure transmitters are being changed from a low-pressure system to a high-pressure system. The TS changes are described in Section 2.2 of this safety evaluation (SE).

2.2 License Amendment Description

The licensee requested the NRC's approval of a license amendment to revise the TSs due to the replacement of the pressure transmitters in combination with the upgrade of Turbine Control System, which includes the change of the EHC System from a low-pressure system to a high-pressure system. The proposed changes of AVs are due to the higher EHC System operating pressure.

In the supplemental letter dated June 13, 2019, the licensee responded to the NRC staff's clarification questions that were transmitted to the licensee by e-mails dated April 25, 2019, and May 9, 2019. This supplement corrected the LAR dated January 23, 2019.

In the original LAR and its supplement dated June 13, 2019, the licensee proposed the following changes (the changes are in bold):

2.2.1 Revision to TS 3.3.1.1, Table 3.3.1.1-1, "Reactor Protection System Instrumentation"

2.2.1.1 Proposed changes of AVs of Functions 9 and 10 in TS Table 3.3.1.1-1

The existing and proposed TS Table 3.3.1.1-1, states, in part:

Function	Allowable Value	
	Existing	Proposed
9. Turbine Stop Valve Closure, Trip Oil Pressure - Low	≥ 37 psig[2]	≥ 644 psig
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≥ 42 psig	≥ 938 psig

2.2.1.2 Proposed Addition of Notations (c) and (d) to SR 3.3.1.1.9 and SR 3.3.1.1.12, and Addition of Notes (c) and (d) at the End of Table 3.3.1.1-1

The existing and proposed TS Table 3.3.1.1-1, states, in part:

Function	Surveillance Requirements	
	Existing	Proposed
9. Turbine Stop Valve Closure, Trip Oil Pressure - Low	SR 3.3.1.1.9 SR 3.3.1.1.12	SR 3.3.1.1.9 (c)(d) SR 3.3.1.1.12(c)(d)
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	SR 3.3.1.1.9 SR 3.3.1.1.12	SR 3.3.1.1.9 (c)(d) SR 3.3.1.1.12(c)(d)

Proposed Footnote (c) states:

> If the as-found channel setpoint is outside its pre-defined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

Proposed Footnote (d) states:

> The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the

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[2] Pounds per square inch gauge (psig).

as-found and as-left tolerances are specified in the Technical Requirements Manual.

2.2.2 Revise TS 3.3.4.1, "End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation," SR 3.3.4.1.2 and SR 3.3.4.1.3

2.2.2.1 Proposed Changes to the Surveillance of SR 3.3.4.1.3.a and SR 3.3.4.1.3.b in TS 3.3.4.1.

The existing and proposed SR 3.3.4.1.3.a and SR 3.3.4.1.3.b states in part:

	Surveillance	
	Existing	Proposed
SR 3.3.4.1.3.a	TSV Closure, Trip Oil Pressure-Low: ≥ 37 psig.	TSV Closure, Trip Oil Pressure- Low: ≥ **644** psig
SR 3.3.4.1.3.b	TCV Fast Closure, Trip Oil Pressure- Low: ≥ 42 psig.	TCV Fast Closure, Trip Oil Pressure- Low: ≥ **938** psig.

2.2.2.2 Proposed Addition of NOTES 1 and 2 to SR 3.3.4.1.2 and SR 3.3.4.1.3 in TS 3.3.4.1.

Proposed NOTE 1 is identical to Note (c) and NOTE 2 is identical to Note (d), as described in Section 2.2.1.2 of this SE.

2.3 Regulatory Requirements and Guidance:

Regulatory Requirements:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," specifically, Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," to 10 CFR Part 50, provides the minimum necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety. The following GDCs are applicable to this LAR:

- GDC 10, "Reactor design," states, in part, that the RPS shall be designed "to assure that specified, acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences."

- GDC 13, "Instrumentation and control," states,

> Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

- GDC 20, "Protection system functions," states,

  > The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety."

- GDC 29, "Protection against anticipated operational occurrences," states,

  > The protection and reactivity control systems shall be designed to assure an extremely high probability of accomplishing their safety functions in the event of anticipated operational occurrences.

The following sections of 10 CFR 50.36, "Technical specifications," are applicable to this LAR:

- Section 50.36(a)(1) states, in part, "each applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section."

- Section 50.36(c)(1)(ii)(A) states, in part,

  > Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor.

- Section 50.36(c)(3), "Surveillance requirements," states,

  > Surveillance 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.

Regulatory Guidance:

- Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," dated December 1999 (ADAMS Accession No. ML993560062), describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within, and remain within the TS limits. RG 1.105 endorses Part I of Instrument Society of America (ISA) Standard ISA-S67.04-1994, "Setpoints for Nuclear Safety-Related Instrumentation." Part I establishes a framework for ensuring that setpoints for nuclear safety-related instrumentation are established and maintained within specified limits.

The NRC staff used this guide to establish the adequacy of the licensee's setpoint calculation.

- The NRC staff considered in its review of the LAR, the NRC Notice of Availability of the Models for Plant-Specific Adoption of Technical Specifications Task Force Traveler TSTF-493-A, Revision 4, "Clarify Application of Setpoint Methodology for LSSS Functions," Option A, published in the *Federal Register* on May 11, 2019 (75 FR 26294; May 11, 2019), which states in part:

  "Adoption of TSTF-493, Option A with Changes to Setpoint Values

  - The licensee must propose to add footnotes to the applicable functions identified in TSTF-493, Revision 4, Appendix A.

  - The licensee must provide summary calculations for the revised setpoints as documentation of the plant-specific instrument setpoint methodology for Option A. This includes the calculation basis for the Limiting Trip Setpoint (LTSP), Nominal Trip Setpoint (NTSP), Allowable Value (AV), As-found Tolerance band, and As-left Tolerance band, for each change to an automatic protection instrumentation function setpoint value. If multiple similar setpoints are proposed to be revised, a summary calculation for each type of setpoint being changed may be submitted instead of calculations for individual Functions, provided the LAR contains a reasoned quantitative or qualitative analysis, as appropriate, of how the summary calculation(s) represent the type of setpoint values proposed to be changed."

- NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition (hereinafter referred to as the SRP), Chapter 15, "Transient and Accident Analysis," Section 15.2.1 – 15.2.5, Revision 2, "Loss of External Load; Turbine Trip; Loss of Condenser Vacuum; Closure of Main Steam Isolation Valve (BWR [Boiling Water Reactor]); and Steam Pressure Regulator Failure (Closed)," dated March 2007 (ADAMS Accession No. ML070300702).

  Loss of External Load: This discussion states, in part, that "In a loss of external load event, an electrical disturbance causes loss of a significant portion of the generator load. ... Immediate fast closure of the turbine control valves (TCVs) is initiated for a loss of generator load."

  Turbine Trip: This discussion states, in part, that "In a turbine trip event, a malfunction of a turbine or reactor system causes the turbine to trip off the line by abruptly stopping steam flow to the turbine. This event is different from the loss of external load condition in that fast closure of the turbine stop valves (TSVs) is initiated. The TSV closure times are faster (0.10 second) than those of the TCVs, resulting in more severe transients."

Supplemental Guidance:

- NEDC-31336P-A, "General Electric Instrument Setpoint Methodology," dated September 1996 (Nonproprietary version; ADAMS Accession No. ML073450560).

- NRC Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006 (ADAMS Accession No. ML051810077). This document discusses the requirements of 10 CFR 50.36 related to LSSS and provides an approach acceptable to the NRC and addresses LSSS issues.

- NUREG-1434, "Standard Technical Specifications, General Electric BWR/6 Plants," Revision 4.0, Reactor Protection System (RPS) Instrumentation, Specification 3.3.1.1A, TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation" (ADAMS Accession No. ML12104A195).

3.0 TECHNICAL EVALUATION

3.1 Licensee Methodology

Based on NEDC-31336P-A, the licensee has created and uses the Grand Gulf instrument setpoint methodology, Instrumentation and Control Standard GGNS-JS-09, "Methodology for the Generation of Instrument Loop Uncertainty & Setpoint Calculations," which includes:

- A description of the setpoint methodology and procedures used in determining setpoints, including information sources, scope, assumptions, interface reviews, and statistical methods. The procedures used in the setpoint methodology also address how the random and the bias errors are combined to calculate the total loop error.

- The basis for acceptable as-found band and acceptable as-left band and determination of the instrument operability based on the acceptable as-found band and acceptable as-left band.

- The basis for assumptions regarding instrument uncertainties and a discussion of the method used to determine uncertainty values.

In Section 3.1, "Instrumentation Setpoints and Uncertainties," of the LAR dated January 23, 2019, the licensee states, in part:

> Setpoint calculations provide a conservative analysis of setpoints, taking into account the applicable instrument measurement errors.
>
> ...
>
> The Nominal Trip Setpoint (NTSP) is more conservative than the AV. Because it is impossible to set an instrument channel to an exact value, a calibration tolerance is established around the NTSP. The NTSP is, therefore, considered a nominal value and the instrument adjustment is considered successful if the "as-left" instrument setting is within the calibration tolerance established around

the NTSP. The NTSP is specified in the Technical Requirements Manual (TRM), not in the TS.

In Section 3.1.1, "Calculation for Function 9, "Turbine Stop Valve Closure, Trip Oil Pressure – Low," and Section 3.1.2, "Calculation for Function 10, "turbine Control Valve Fast Closure, Trip Oil Pressure – Low," of Attachment 4 of the supplemental letter dated June 13, 2019, the licensee provided calculations (JC-Q1C71-N606-1 and JC-Q1C71-N605-1) of the NTSP and the AV for Functions 9 and 10. These calculations are based on Procedure GGNS-JS-09 and the assumptions, which are based on the vendor data. These setpoint calculations are based on the individual instrument errors. The calculations determine the setpoints for Function 9, and for Function 10.

The licensee combined random errors using the square-root-of sum-of squares (SRSS) and algebraic sum for the bias errors to calculate the instrument errors, which are based on the guidance of RG 1.105.

Based on the NRC Notice of Availability of the Proposed Model for Plant-Specific Adoption of TSTF-493, the licensee provided the summary of the calculations for the revised setpoints. This includes the calculation basis for the NTSP, AV, As-found Tolerance band, and As-left Tolerance band, for each change to the automatic protection instrumentation function setpoint value.

The NRC staff reviewed the licensee's assumptions and setpoint methodology and determined that it meets the intent of RG 1.105, Revision 3 and is consistent with RIS 2006-17 and the NRC Notice for Plant Specific Adoption of TSTF-493.

3.2 NRC Staff Evaluation

Using the regulatory requirements and guidance (shown in Section 2.3 of this SE), the NRC staff reviewed the original LAR, as supplemented by letter dated June 13, 2019, to verify that the setpoint values provided are adequate to assure, with a high confidence level, that the control and monitoring setpoints are established and maintained in a manner consistent with the plant safety function requirements that assure the required protective actions will be initiated before the associated plant process parameters exceed the analytical limit.

3.2.1 Revise TS 3.3.1.1, Table 3.3.1.1-1, "Reactor Protection System Instrumentation"

3.2.1.1 Evaluation of Proposed Allowable Values (AVs) of Functions 9 and 10 in TS Table 3.3.1.1-1

The licensee proposed to revise the AVs of Functions 9 and 10, as described in Section 2.2.1.1 of this SE.

In its response to the NRC staff's Question-3, the licensee provided a "Rewrite of Sections 3.1.1 and 3.1.2 of Enclosure to GNRO-2019/00003," in Attachment 4 of the supplemental letter dated June 13, 2019. In these sections, the supplemental letter provided the summary of loop tolerances and the calibration tolerances pertaining to Calculation JC-Q1C71-N606-1 for Function 9 and Calculation Q1C71-N605-1 for Function 10 in TS Table 3.3.1.1-1

These calculations include:

- The assumptions used in Calculations JC-Q1C71-N606-1 and Q1C71-N605-1.

- The "Summary of Results" tables provided the values of Total Loop Uncertainty (TLU); Loop Uncertainty (LU); Loop Drift Allowance (D_L); Loop Calibration Uncertainty (C_L); NTSP; AV; and Analytical Limit (AL) for Functions 9 and 10. These tables have a footnote, which states, "Values specified in the TS or TRM," for the NTSP and AV. The licensee also noted that "The NTSP is in TRM Table TR 3.3.1.1-1."

- The "Summary of Calibration Tolerances" tables provided the calibrations tolerances, as-found and as-left transmitters (AFT_1 and ALT_1); as-found and as-left trip units (AFT_2 and ALT_2); and as-found and as-left loop tolerances (AFT_L and ALT_L).

The NRC staff reviewed the licensee's assumptions and determined that these assumptions appeared to be reasonable and hence, are acceptable to the staff.

The licensee used the SRSS method to calculate the accuracy or uncertainty of the measurement for each device in the measurement channel, including the trip unit, and added the algebraic sum of the bias errors to calculate the total errors. The NRC staff finds that these methods are consistent with the guidance of RG 1.105.

In these calculations, the licensee calculated the TLU; LU; D_L; C_L; NTSP; and AV for Functions 9 and 10.

LU (Loop Uncertainty)

$$LU = \pm SRSS (A_L, C_L, SPE, PM) \pm IR - L_L + M_L$$
$$= \pm SRSS (A_L, C_L)$$

In the Calculation JC-Q1C71-N606-1 (calculation for Function 9) and Calculation JC-Q1C71-N605-1 (calculation for Function 10), the licensee used the assumptions and the vendor data: IR = 0 (Assumption 5); SPE = 0 (Assumption 10); PM = 0 (Assumption 11); $D_L = 0$ (Assumption 4, 13); $L_L = 0$ and $M_L = 0$ (Using the vendor data).

TLU (Total Loop Uncertainty)

$$TLU = LU + D_L$$

Where:
- A_L: SRSS of all device random uncertainties except drift
- C_L: SRSS of all measurement and test equipment (M&TE) inaccuracies used for calibration
- SPE: Static Pressure Effects
- PM: Process Measurement Effects
- IR: Insulation Resistance Effects
- D_L: SRSS of all drift
- L_L: Sum of all negative bias uncertainties (none for these calculations)
- M_L: Sum of all positive bias uncertainties

[Loop errors are subscripted with an "L"]

In Section 3.1 of LAR dated January 23, 2019, the licensee defined the AV and AL. The AL is the minimum pressure in the trip header that will maintain the valve open. The licensee stated,

in part, "This approach provides sufficient margin between the AL and AV to ensure at least 95% probability that the AL is not exceeded if the setpoint drifts toward the AV."

The licensee noted that the AL was determined in calculation WNA-CN-00532-GGF1, "Reactor Protection System (RPS) Transmitter Pressure Setpoint."

The licensee defined the TS AV and NTSP by the equations below:

AV	≥	AL + LU	Equation 1
NTSP	≥	AL + TLU + margin for license event report (LER) avoidance	Equation 2

The licensee's note states: "the 'margin for LER avoidance' is a value selected [22.7 psig] to ensure the final LER avoidance value is acceptable."

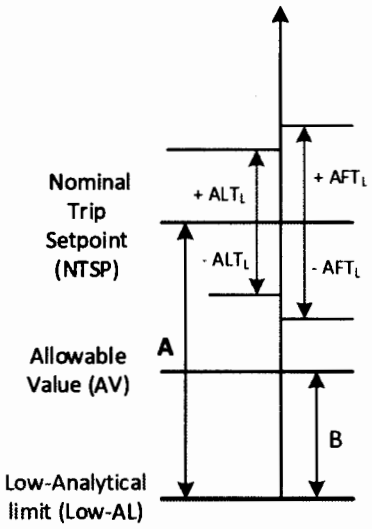
The NRC staff finds that the licensee's calculations are based on RG 1.105, Revision 3, which presents acceptable methods for combining uncertainties in determining a trip setpoint and its allowable values and Section 4, "Establishment of Setpoints," of the American National Standards Institute (ANSI)/ISA-S67.04.01-1994, which is endorsed within RG 1.105, to independently calculate the TLU for a process parameter that is increasing, using the following equations:

NTSP	=	AL – TLU; thus,	
TLU (A)	=	AL – NTSP	(Equation 3)
Margin (B)	=	AL – AV	(Equation 4)
Margin %	=	(B/A) x 100 %	(Equation 5)

The licensee's results of the Grand Gulf transmitter uncertainty calculations are illustrated in Figure 1 below. The staff independently calculated the percent AV margins of Functions 9 and 10, and the results are shown on Rows 14 - 15 of the table "AV Margin Calculation" in Figure 1.

Figure 1: NRC Staff Margin Calculation

Grand Gulf Allowable Value, Trip Setpoints, and Analytical Limit Relationships



Low-AL: Minimum pressure in the trip header that will maintain the valve open.

AV Margin Calculation

Row #		Function # 9	Function # 10
		Pressure (psig)	
1	Low - AL	614.00	908.00
2	TLU (±)	38.30	38.3
3	LU (±)	29.08	29.08
4	LER	22.7	22.7
5	ALT_L (±)	9.60	9.60
6	AFT_L (±)	23.63	23.63
7	NTSP ≥ AL + TLU + LER	675.00	969.00
8	NTSP + ALT_L ≥ AV	684.60	978.60
9	NTSP - ALT_L ≥ AV	665.40	959.40
10	NTSP + AFT_L ≥ AV	698.63	992.63
11	NTSP - AFT_L ≥ AV	651.37	969.00
12	AV ≥ Low AL + LU (calculated)	643.08	937.08
13	AV ≤ Low AL + LU (specified)	[illegible]	[illegible]
14	A = mag (Low AL - NTSP)	61.00	61.00
15	B = mag (Low AL - AV)	29.08	29.08
16	% Margin = (B/A)*100	47.67	47.67

As-Left Loop Tolerance (ALT_L) / As-Found Loop Tolerance (AFT_L)
Absolute Value / Magnitude (mag)

As indicated in Figure 1 above, the proposed NTSP with the as-left and as-found loop tolerance bands will be greater than the AV to ensure that the actual setpoints do not exceed the AV as the statement of the Grand Gulf Reactor Protection System Instrumentation bases. In addition, the NRC staff finds that the margin percent (as indicated in Figure 1 above) are adequate at a value of 47.67 percent. These margins reflect that the trip setpoints have been chosen to assure that a trip or safety actuation will occur automatically and significantly before the measured process reaches the Low-AL level. Thus, these proposed AVs for the TSV Closure, Trip Oil Pressure-Low and TCV Fast Closure, Trip Oil Pressure – Low functions are consistent with RG 1.105 and satisfy the requirements of 10 CFR 50.36(c)(1)(ii)(A) and GDC 13.

Based on the above evaluations, the NRC staff finds that the proposed revision of the Grand Gulf TSs regarding the AV for Function 9 (TSV Closure, Trip Oil Pressure – Low) and Function 10 (TCV Fast Closure, Trip Oil Pressure – Low) is acceptable because, the methodology, analysis and assumptions used in this application are consistent with the regulatory requirements and the conditions identified in Section 2.3 of this SE.

3.2.1.2 Evaluation of Proposed Addition of Notations (c) and (d) to SR 3.3.1.1.9 and SR 3.3.1.1.12, and Notes (c) and (d) into TS Table 3.3.1.1-1

In the LAR, the licensee proposed to have Notes (c) and (d) applied to SR 3.3.1.1.8, "Perform Channel Functional Test," and SR 3.3.1.1.12, "Perform Channel Calibration," for Functions 9 and 10 in TS Table 3.3.1.1-1.

In the licensee's June 13, 2019, responses to the NRC staff's Question-1 and Question-2, the licensee stated, in part, "The proposed TS changes should have had Notes (d) and (e) applied

to SR 3.3.1.1.9 instead of SR 3.3.1.1.8 for Functions 9 and 10. GGNS TS surveillance SR 3.3.1.1.9, "Calibrate the trip units," is equivalent to SR 3.3.1.1.8 in NUREG-1434." In Attachments 1 and 2, "Corrections Made to Original Submittal Technical Specifications (Mark-up and Clean Type-Pages) TS Page 3.3-8," of the licensee's supplemental letter dated June 13, 2019, the licensee proposed to have Notes (c) and (d) applied to SR 3.3.1.1.9, "Calibrate the trip units," and SR 3.3.1.1.12, "Perform Channel Calibration," for Functions 9 and 10 in TS Table 3.3.1.1-1. The proposed Notes (c) and (d) are described in Section 2.2.1.2 of this SE. The licensee noted that these notes would only be applicable to SR 3.3.1.1.9 and SR 3.3.1.1.12 for Functions 9 and 10.

In the Transmittal of TSTF-493, Revision 4, Errata (ADAMS Accession No. ML100060064), Notes 1 and 2 include instrument function in the Limiting Conditions for Operation (LCOs) for RPS and some instrument functions in other LCOs identified in the BWR specifications (i.e., NUREG-1433 and NUREG-1434). The NRC staff reviewed Notes 1 and 2 of TSTF-493 and found that these notes are identical to proposed Notes (c) and (d) as described in Section 2.2.1.2 of this SE.

In NUREG-1434, Table 3.3.1.1-1, "Reactor Protection System Instrumentation," Notes (a) and (b) are applied for SR 3.3.1.1.8 and SR 3.3.1.1.11." The NRC staff reviewed Notes (a) and (b) of NUREG-1434 and found that these notes are identical with Notes 1 and 2 of TSTF-493, and proposed Notes (c) and (d) as described in Section 2.2.1.2 of this SE.

The NRC staff notes that the licensee's proposed Note (d) states, in part, "The NTSP and the methodologies used to determine the as-found and the as-left tolerances are specified in the Technical Requirements Manual."

In the NRC Notice of Availability of the Models for Plant-Specific Adoption of TSTF-493, Revision 4, the NRC staff requested that each licensee applying for the changes proposed in TSTF-493, Revision 4 to include the following:

> "Adoption of TSTF-493, Option A with Changes to Setpoint Values
>
> - The licensee must propose to add footnotes to the applicable functions identified in TSTF-493, Revision 4, Appendix A.
>
> - The licensee must provide summary calculations for the revised setpoints as documentation of the plant-specific instrument setpoint methodology for Option A. This includes the calculation basis for the Limiting Trip Setpoint (LTSP), Nominal Trip Setpoint (NTSP), Allowable Value (AV), As-found Tolerance band, and As-left Tolerance band, for each change to an automatic protection instrumentation function setpoint value. If multiple similar setpoints are proposed to be revised, a summary calculation for each type of setpoint being changed may be submitted instead of calculations for individual Functions, provided the LAR contains a reasoned quantitative or qualitative analysis, as appropriate, of how the summary calculation(s) represent the type of setpoint values proposed to be changed.

The NRC staff reviewed the licensee's Notes (c) and (d) and finds that these notes follow the guidance of TSTF-493, Revision 4; are consistent with NUREG-1434; and the requirements of 10 CFR 50.36(c)(3) are met because, with the proposed Notes (c) and (d), the SR 3.3.1.1.9 and

SR 3.3.1.1.12 will have more direction 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. Therefore, the proposed additions of Notes (c) and (d) to SR 3.3.1.1.9 and SR 3.3.1.1.12 for Functions 9 and 10 in TS Table 3.3.1.1-1 are acceptable.

3.2.2 Revise TS 3.3.4.1, "End of Cycle Recirculation Pump Trip (EOC-RPT) Instrument"

3.2.2.1 Evaluation of SRs 3.3.4.1.3.a and 3.3.4.1.3.b

In accordance with the proposed modification of the AVs of Functions 9 and 10 in TS Table 3.3.1.1-1, the licensee proposed to revise the SR 3.3.4.1.3.a and SR 3.3.4.1.3.b as described in Section 2.2.2.1 of this SE.

The NRC staff finds that the changes to SR 3.3.4.1.3.a and SR 3.3.4.1.3.b are consistent with the changes of the AV for Functions 9 and 10 in TS Table 3.3.1.1-1, which were evaluated in Section 3.2.1.1 of this SE. These SR modifications will support the LCOs of TSV Closure, Trip Oil Pressure - Low and TCV Fast Closure, Trip Oil Pressure - Low of the EOC-RPT Instrumentation due to the replacement of the pressure transmitters that sense EHC system pressure and provide signals to the RPS.

Based on the information discussed in Section 3.2.1.1 of this SE, the NRC staff finds that the changes to SR 3.3.4.1.3.a and SR 3.3.4.1.3.b are acceptable because the changes are consistent with RG 1.105 and satisfy the requirements of 10 CFR 50.36(c)(1)(ii)(A) and GDC 13.

3.2.2.2 Evaluation of the Proposed Addition of NOTES 1 and 2 to SR 3.3.4.1.2 and SR 3.3.4.1.3

In accordance with the transmittal of TSTF-493, the licensee proposed to add NOTES 1 and 2 into SR 3.3.4.1.2 and SR 3.3.4.1.3 stating that NOTES 1 and 2 are identical to the proposed Notes (c) and (d), as described in Section 2.2.1.2 of this SE.

The NRC staff reviewed NOTES 1 and 2 and verified that the requirements of these proposed notes are the same as the requirements of proposed Notes (c) and (d). Therefore, as discussed in Section 3.2.1.2 of this SE, these proposed NOTES 1 and 2 are identical to NOTES 1 and 2 of TSTF-493-A, Revision 4.

Based on evaluation in Section 3.2.1.2, of this SE, the NRC staff finds that the proposed revision of the Grand Gulf TSs regarding the addition of NOTES 1 and 2 into SR 3.3.4.1.2 and SR 3.3.4.1.3 is acceptable because the change is consistent with TSTF-493, Revision 4, and satisfies the requirements of 10 CFR 50.36(c)(3).

3.2.3 Impact of the Proposed Changes on the Transient Events

The RPS is comprised of two independent trip systems with two logic channels in each trip system. The outputs of the logic channels in a trip system are combined in a one-out-of-two logic so either channel can trip the associated trip system. The tripping of both trip systems will

produce a reactor scram. This logic arrangement is known as one-out-of-two taken twice logic. Each trip system can be reset by use of a reset switch.

Two conditions which can initiate reactor scram are TSV closure and TCV fast closure when reactor power is above a preselected percent of RTP (≥ 35.4 percent RTP at Grand Gulf). Either TSV or TCV closure causes loss of heat sink that produces reactor pressure, neutron flux, and heat flux transients. As a result, reactor scram is initiated at the start of TSV or TCV closure in anticipation of the transients that would result from the closure of these valves. The TSV Closure, Trip Oil Pressure - Low Function is the primary scram signal for the turbine trip (TT) transient, and the TCV fast closure, trip oil pressure - low function is the primary scram signal for the generator load rejection no bypass (LRNB) transient. For both of these transient events, the reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the EOC-RPT, causes rapid core flow reduction increasing core void content and thereby, reduces reactivity in conjunction with the control rod scram. This ensures that the minimum critical power ratio safety limit is not exceeded. Credit is taken for successful operation of the RPS for both TT and LRNB transient events.

The only anticipated operational occurrences that had the potential to be affected by the proposed change are the TT and the LRNB events. In Section 15.2.2, "Generator Load Rejection," of the Grand Gulf Updated Final Safety Analysis Report, it is stated that the LRNB event is the most limiting of the class of transients characterized by rapid vessel pressurization for Grand Gulf. The load rejection causes a fast closure of the TCVs. The resulting compression wave travels through the steam lines into the vessel and creates the rapid pressurization condition. A reactor scram and a recirculation pump transfer from high to low speed are initiated by fast closure of the control valves. Condenser bypass flow, which can mitigate the pressurization effect, is not credited. The excursion of the core power due to void collapse is primarily terminated by the reactor scram and void growth due to the recirculation pump high to low speed transfer. The LRNB event requires analysis for each fuel loading cycle.

In Section 4.3 of the original LAR, dated January 23, 2019, the licensee stated, in part, that:

> A change in the turbine stop valve closure trip oil pressure and turbine control valve fast closure trip oil pressure TS AVs does not introduce any mechanisms that would increase the probability of an accident previously analyzed. The reactor trip on turbine stop valve closure or turbine control valve fast closure is initiated by the same protective signals. There is no change in form or function of this signal and the probability or consequences of previously analyzed accidents are not impacted.

The NRC staff understands that the original pressure transmitter configuration and the new pressure transmitter configuration both generate the same reactor trip signal. The only difference in these configurations is that the initiation of the trip will now be adjusted to a system of higher pressure. The function of sensing and transmitting a reactor trip signal on TSV closure or TCV fast closure remains the same. As a result, the proposed change to revise the AVs for the TSV closure and the TCV fast closure trip oil pressure function does not affect the RPS trip functions for TT and LRNB transient events, and has no impact on the evaluation of the plant's response to either of these events. Further, the change does not alter the assumptions made in the safety analysis and ensures that the instruments perform, as assumed, in the accident analysis. Hence, the proposed amendment does not change the results documented in the current analysis of record for the TT and the LRNB events; therefore, the licensee is not

required to reanalyze these events in support of this LAR. On the basis of its review, the NRC staff finds the proposed changes acceptable.

4.0 SUMMARY

The NRC staff evaluated the licensee's justifications for the proposed changes, as described in Section 3.0 of this SE, against the applicable regulatory requirements and guidance in Section 2.3 of this SE. The NRC staff independently confirmed that the proposed revision of the Grand Gulf TSs regarding the AV for Function 9 and Function 10 is consistent with NRC guidance. The proposed settings have been chosen so that an automatic protective action will correct the abnormal situation before a safety limit is exceeded.

The licensee is replacing the Grand Gulf pressure transmitters from a low-pressure to a high-pressure system that senses the EHC system pressure and provides signals to the RPS in conjunction with an upgrade of the turbine control system. Higher EHC system operating pressure requires revisions to the AV for the TSV closure trip oil pressure and TCV fast closure trip oil pressure functions.

The NRC staff concludes that the only anticipated operational occurrences that have the potential to be affected by the proposed change were the TT and LRNB transient events. However, because the change does not affect the RPS trip functions for these events, the amendment has no impact on the plant's response to TT and LRNB events, as currently analyzed. In addition, the change does not alter the assumptions made in the safety analysis and ensures that the instruments perform, as assumed, in the accident analysis. As such, the proposed amendment does not change the results documented in the current analysis of record for TT and LRNB events, and therefore the licensee is not required to reanalyze these events. This satisfies the requirements to analyze the plant's responses to postulated events described in SRP Chapter 15.2.1-5. The staff further concludes that the proposed amendment continues to meet GDC 10, 20, and 29 requirements, which includes a requirement that the protection system shall be designed to initiate automatically the operation of appropriate systems, including the reactivity control systems, to assure that the SAFDLs are not exceeded as a result of the anticipated operational occurrences, and to sense accident conditions and to initiate the operation of systems and components important to safety. In addition, the proposed TS changes are consistent with the requirements of 10 CFR 50.36 with regard to the plant SRs.

Based on the above evaluation, the NRC staff concludes that the proposed TS changes, discussed in Section 3.2 of this SE, are acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment on December 3, 2019. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative

occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration published in the *Federal Register* on March 12, 2019 (84 FR 8910), and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

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

Principal Contributors: H. Vu, NRR
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Date: January 6, 2020

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – ISSUANCE OF AMENDMENT NO. 223 TO REVISE TECHNICAL SPECIFICATION (TS) 3.3.1.1, "REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION," AND TS 3.3.4.1, "END OF CYCLE RECIRCULATION PUMP TRIP (EOC-RPT) INSTRUMENTATION" (EPID L-2019-LLA-0007) DATED JANUARY 6, 2020

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