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

July 29, 2024

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. 234 - RE: REVISION TO TECHNICAL SPECIFICATIONS TO ADOPT TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES – RITSTF INITIATIVE 4b" (EPID L-2023-LLA-0081)

Dear Vice President, Operations:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 234 to Renewed Facility Operating License No. NPF-29 for Grand Gulf Nuclear Station, Unit 1. This amendment consists of changes to the technical specifications (TSs) in response to your application dated June 6, 2023, as supplemented by letters dated May 1, 2024, and June 13, 2024.

The amendment revises the Grand Gulf TSs to permit the use of risk-informed completion times for actions to be taken when limiting conditions for operation are not met.

The changes are based on Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF [Risk-Informed TSTF] Initiative 4b," dated July 2, 2018. The NRC staff issued a final model safety evaluation approving TSTF-505, Revision 2, on November 21, 2018.

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

Sincerely,

/RA/

Zachary M. Turner, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:
1. Amendment No. 234 to NPF-29
2. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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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. 234
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 June 6, 2023, as supplemented by letters dated May 1, 2024, and June 13, 2024, 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) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 234 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 180 days from the date of issuance. Implementation of the amendment shall also include the completion of the attachment 6, table A6-1, “RICT Program PRA Implementation Items.”

FOR THE NUCLEAR REGULATORY COMMISSION

Jennivine K. Rankin

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Date: 2024.07.29 15:25:29 -04'00'

Jennivine K. Rankin, 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: July 29, 2024

ATTACHMENT TO LICENSE AMENDMENT NO. 234

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

Remove	Insert
-4-	-4-

Technical Specifications

Remove	Insert
1.0-23	1.0-23
--------	1.0-23a
3.1-21	3.1-21
3.3-1	3.3-1
3.3-25	3.3-25
3.3-26	3.3-26
3.3-29	3.3-29
3.3-33	3.3-33
3.3-34	3.3-34
3.3-35	3.3-35
3.3-36	3.3-36
3.3-37	3.3-37
3.3-44	3.3-44
3.3-45	3.3-45
3.3-48	3.3-48
3.3-63	3.3-63
3.3-64	3.3-64
3.3-71	3.3-71
3.3-77	3.3-77
3.5.1	3.5.1
3.5.1a	3.5.1a
3.5-2	3.5-2
3.5-10	3.5-10
3.6-6	3.6-6
3.6-10	3.6-10
3.6-12	3.6-12
3.6-20	3.6-20
3.6-22	3.6-22

Technical Specifications (continued)

Remove	Insert
3.6-31	3.6-31
3.6-33	3.6-33
3.6-56	3.6-56
3.6-58	3.6-58
3.7-1	3.7-1
3.7-2	3.7-2
3.8-2	3.8-2
3.8-3	3.8-3
3.8-4	3.8-4
------	3.8-4a
3.8-26	3.8-26
3.8-38	3.8-38
5.0-16b	5.0-16b
-------	5.0-16c

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. 234 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.

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7 (continued)

Condition B is entered, but continues from the time Condition A was initially entered. If Required Action A.1 is met after Condition B is entered, Condition B is exited and operation may continue in accordance with Condition A, provided the Completion Time for Required Action A.2 has not expired.

EXAMPLE 1.3-8

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Restore subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

When a subsystem is declared inoperable, Condition A is entered. The 7 day Completion Time may be applied as discussed in Example 1.3-2. However, the licensee may elect to apply the Risk Informed Completion Time Program which permits calculation of a Risk Informed Completion Time (RICT) that may be used to complete the Required Action beyond the 7 day Completion Time. The RICT cannot exceed 30 days. After the 7 day Completion Time has expired, the subsystem must be restored to OPERABLE status within the RICT or Condition B must also be entered.

1.3 Completion Times

The Risk Informed Completion Time Program requires recalculation of the RICT to reflect changing plant conditions. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

If the 7 day Completion Time clock of Condition A has expired and subsequent changes in plant condition result in exiting the applicability of the Risk Informed Completion Time Program without restoring the inoperable subsystem to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start.

If the RICT expires or is recalculated to be less than the elapsed time since the Condition was entered and the inoperable subsystem has not been restored to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the inoperable subsystems are restored to OPERABLE status after Condition B is entered, Condition A is exited, and therefore, the Required Actions of Condition B may be terminated.

IMMEDIATE COMPLETION TIME	When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Standby Liquid Control (SLC) System

LCO 3.1.7 Two SLC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Product of Sodium Pentaborate concentration in weight percent (C) times Boron-10 enrichment in atom percent (E) < 420	A.1 Restore (C)(E) ≥ 420	8 hours
B. Sodium pentaborate solution volume < 4,200 gallons.	B.1 Restore Volume to ≥ 4,200 gallons.	8 hours
C. Sodium pentaborate solution temperature < 45°F or > 150°F.	C.1 Restore temperature to ≥ 45°F and ≤ 150°F.	8 hours
D. One SLC subsystem inoperable for reasons other than Conditions A, B or C.	D.1 Restore SLC subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
E. Two SLC subsystems inoperable for reasons other than Conditions A, B or C.	E.1 Restore one SLC subsystem to OPERABLE status.	8 hours
F. Required Action and associated Completion Time not met.	F.1 Be in MODE 3.	12 hours

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip. OR ----------Note---------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- A.2 Place associated trip system in trip.	12 hours OR In accordance with the Risk Informed Completion Time Program 12 hours OR In accordance with the Risk Informed Completion Time Program
----------NOTE---------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- B. One or more Functions with one or more required channels inoperable in both trip systems.	B.1 Place channel in one trip system in trip. OR B.2 Place one trip system in trip.	6 hours OR In accordance with the Risk Informed Completion Time Program 6 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

3.3 INSTRUMENTATION

3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation

LCO 3.3.4.1

a. Two channels per trip system for each EOC-RPT instrumentation Function listed below shall be OPERABLE:

1. Turbine Stop Valve (TSV) Closure, Trip Oil Pressure-Low; and

2. Turbine Control Valve (TCV) Fast Closure, Trip Oil Pressure-Low.

OR

b. LCO 3.2.2, “MINIMUM CRITICAL POWER RATIO (MCPR),” limits for inoperable EOC-RPT as specified in the COLR are made applicable.

APPLICABILITY: THERMAL POWER ≥ 35.4% RTP with any recirculation pump in fast speed.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Restore channel to OPERABLE status. OR	72 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	----------NOTE---------- Not applicable if inoperable channel is the result of an inoperable breaker. ----------	
		Place channel in trip.	72 hours OR In accordance with the Risk Informed Completion Time Program
B. One or more Functions with EOC-RPT trip capability not maintained. AND MCPR limit for inoperable EOC-RPT not made applicable.	B.1	Restore EOC-RPT trip capability.	2 hours
	OR		
	B.2	Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR.	2 hours
C. Required Action and associated Completion Time not met.	C.1	Remove the associated recirculation pump fast speed breaker from service.	4 hours
	OR		
	C.2	Reduce THERMAL POWER to < 35.4% RTP.	4 hours

3.3 INSTRUMENTATION

3.3.4.2 Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation

LCO 3.3.4.2 Two channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE:

a. Reactor Vessel Water Level-Low Low, Level 2; and

b. Reactor Vessel Pressure-High.

APPLICABILITY: MODE 1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more channels inoperable.	A.1	Restore channel to OPERABLE status.	14 days <u>OR</u>
	<u>OR</u>		
	A.2	----------NOTE---------- Not applicable if inoperable channel is the result of an inoperable breaker. --- Place channel in trip.	In accordance with the Risk Informed Completion Time Program 14 days <u>OR</u> In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	----------NOTE---------- Only applicable for Functions 3.a and 3.b. ----------	
		Declare High Pressure Core Spray (HPCS) System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	AND		
	B.3	Place channel in trip.	24 hours OR In accordance with the Risk Informed Completion Time Program
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1	----------NOTE---------- Only applicable for Functions 1.c, 1.d, 2.c, and 2.d. ----------	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Restore channel to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
D. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	D.1 ----------NOTE---------- Only applicable if HPCS pump suction is not aligned to the suppression pool. ---------- Declare HPCS System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	AND	
	D.2.1 Place channel in trip.	24 hours
	OR	OR
		In accordance with the Risk Informed Completion Time Program
	D.2.2 Align the HPCS pump suction to the suppression pool.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.1	----------NOTE---------- Only applicable for Functions 1.e, 1.f, and 2.e. ----------	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND		
	E.2	Restore channel to OPERABLE status.	7 days OR ----------NOTE---------- Not applicable when a loss of function occurs. ---------- In accordance with the Risk Informed Completion Time Program
F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	F.1	Declare Automatic Depressurization System (ADS) valves inoperable.	1 hour from discovery of loss of ADS initiation capability in both trip systems
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. (continued)	F.2 Place channel in trip.	96 hours or in accordance with the Risk Informed Completion Time Program from discovery of inoperable channel concurrent with HPCS or reactor core isolation cooling (RCIC) inoperable AND 8 days OR In accordance with the Risk Informed Completion Time Program
G. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	G.1 ----------NOTE---------- Only applicable for Functions 4.c, 4.e, 4.f, 4.g, 5.c, 5.e, and 5.f. ---------- Declare ADS valves inoperable. AND	1 hour from discovery of loss of ADS initiation capability in both trip systems (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued)	G.2 Restore channel to OPERABLE status.	96 hours or in accordance with the Risk Informed Completion Time Program from discovery of inoperable channel concurrent with HPCS or RCIC inoperable AND 8 days OR In accordance with the Risk Informed Completion Time Program
H. Required Action and associated Completion Time of Condition B, C, D, E, F, or G not met.	H.1 Declare associated supported feature(s) inoperable.	Immediately

3.3 INSTRUMENTATION

3.3.5.3 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.3 The RCIC System instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more channels inoperable.	A.1	Enter the Condition referenced in Table 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1	Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	AND		
	B.2	Place channel in trip.	24 hours OR In accordance with the Risk Informed Completion Time Program
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1	Restore channel to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1	----------NOTE---------- Only applicable if RCIC pump suction is not aligned to the suppression pool. ----------	
		Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	AND		
	D.2.1	Place channel in trip.	24 hours
	OR		OR
			In accordance with the Risk Informed Completion Time Program
	D.2.2	Align RCIC pump suction to the suppression pool.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met.	E.1	Declare RCIC System inoperable.	Immediately

3.3 INSTRUMENTATION

3.3.6.1 Primary Containment and Drywell Isolation Instrumentation

LCO 3.3.6.1 The primary containment and drywell isolation instrumentation for each Function in Table 3.3.6.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.1-1.

ACTIONS

----------NOTES----------
1. Penetration flow paths may be unisolated intermittently under administrative control.

2. Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip.	12 hours for Functions 2.b, 5.b, 5.c, and 5.d OR In accordance with the Risk Informed Completion Time Program AND 24 hours for Functions other than Functions 2.b, 5.b, 5.c, and 5.d OR In accordance with the Risk Informed Completion Time Program
B. One or more automatic Functions with isolation capability not maintained.	B.1 Restore isolation capability.	1 hour

(continued)

3.3 INSTRUMENTATION

3.3.6.3 Residual Heat Removal (RHR) Containment Spray System Instrumentation

LCO 3.3.6.3 The RHR Containment Spray System instrumentation for each Function in Table 3.3.6.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.6.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.6.3-1.	B.1 Declare associated RHR containment spray subsystem inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of RHR containment spray initiation capability in both trip systems 24 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.6.3-1.	C.1 Declare associated RHR containment spray subsystem inoperable. AND	1 hour from discovery of loss of RHR containment spray initiation capability in both trip systems
	C.2 Restore channel to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time of Condition B or C not met.	D.1 Declare associated RHR containment spray subsystem inoperable.	Immediately

3.3 INSTRUMENTATION

3.3.6.5 Relief and Low-Low Set (LLS) Instrumentation

LCO 3.3.6.5 Two relief and LLS instrumentation trip systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One trip system inoperable.	A.1	Restore trip system to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
	A.2	Declare associated relief and LLS valve(s) inoperable.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR Two trip systems inoperable.	B.1 AND B.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

3.3 INSTRUMENTATION

3.3.8.1 Loss of Power (LOP) Instrumentation

LCO 3.3.8.1 The LOP instrumentation for each Function in Table 3.3.8.1-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
When the associated diesel generator (DG) is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Place channel in trip.	24 hours OR In accordance with the Risk Informed Completion Time Program
B. One or more Functions with actuation capability not maintained.	B.1 Restore actuation capability.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Declare associated DG inoperable.	Immediately

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of eight safety/relief valves shall be OPERABLE.

----------NOTE----------
Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the residual heat removal cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODE 1,
MODES 2 and 3, except ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to HPCS.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. High Pressure Core Spray (HPCS) System inoperable.	B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE. AND	1 hour
	B.2 Restore HPCS System to OPERABLE status.	14 days OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two ECCS injection subsystems inoperable. OR One ECCS injection and one ECCS spray subsystem inoperable.	C.1 Restore one ECCS injection/spray subsystem to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 -------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	 12 hours
E. One ADS valve inoperable.	E.1 Restore ADS valve to OPERABLE status.	14 days OR In accordance with the Risk Informed Completion Time Program
F. One ADS valve inoperable. AND One low pressure ECCS injection/spray subsystem inoperable.	F.1 Restore ADS valve to OPERABLE status. OR F.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program 72 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to RCIC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Core Spray System is OPERABLE. AND	1 hour
	A.2 Restore RCIC System to OPERABLE status.	14 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	12 hours
	B.2 Reduce reactor steam dome pressure to ≤ 150 psig.	36 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.3 Restore air lock to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND	12 hours
	D.2 Be in MODE 4.	36 hours

ACTION (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one PCIV inoperable except due to leakage not within limit.	----------NOTE---------- Relief valves are not required to be de-activated provided the relief setpoint is at least 23 psig and one of the following criteria is met: 1. the relief valve is one-inch nominal size or less, or 2. the flow path is into a closed system whose piping pressure rating exceeds the containment design pressure rating. ----------	
	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	4 hours except for main steam line OR In accordance with the Risk Informed Completion Time Program
	AND	AND 8 hours for main steam line OR In accordance with the Risk Informed Completion Time Program
	A.2 ----------NOTE---------- Isolation devices in high radiation areas may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	Once per 31 days following isolation for isolation devices outside primary containment, drywell, and steam tunnel AND

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more penetration flow paths with one or more primary containment purge valves not within purge valve leakage limits.	D.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	24 hours OR In accordance with the Risk Informed Completion Time Program
	AND		
	D.2	----------NOTE---------- Isolation devices in high radiation areas may be verified by use of administrative means. ----------	
		Verify the affected penetration flow path is isolated.	Once per 31 days following isolation for isolation devices outside primary containment AND Prior to entering MODE 2 or 3 from MODE 4 if not performed within the previous 92 days for isolation devices inside primary containment
	AND		
	D.3	Perform SR 3.6.1.3.5 for the resilient seal purge valves closed to comply with Required Action D.1.	Once per 92 days following isolation

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Low-Low Set (LLS) Valves

LCO 3.6.1.6 The LLS function of six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One LLS valve inoperable.	A.1	Restore LLS valve to OPERABLE status.	14 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time of Condition A not met.	B.1	-------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours
C. Two or more LLS valves inoperable.	C.1	Be in MODE 3.	12 hours
	AND		
	C.2	Be in Mode 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.7 Residual Heat Removal (RHR) Containment Spray System

LCO 3.6.1.7 Two RHR containment spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR containment spray subsystem inoperable.	A.1 Restore RHR containment spray subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk Informed Completion Time Program
B. Two RHR containment spray subsystems inoperable.	B.1 Restore one RHR containment spray subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1 -------NOTE--------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	 12 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

LCO 3.6.2.3 Two RHR suppression pool cooling subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RHR suppression pool cooling subsystem inoperable.	A.1	Restore RHR suppression pool cooling subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time of Condition A not met.	B.1	---------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours
C. Two RHR suppression pool cooling subsystems inoperable.	C.1	Restore one RHR suppression pool cooling subsystem to OPERABLE status.	8 hours
D. Required Action and associated Completion Time of Condition C not met.	D.1 AND D.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.4 Suppression Pool Makeup (SPMU) System

LCO 3.6.2.4 Two SPMU subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Upper containment pool water level not within limit.	A.1 Restore upper containment pool water level to within limit.	4 hours
B. Upper containment pool water temperature not within limit.	B.1 Restore upper containment pool water temperature to within limit.	24 hours
C. One SPMU subsystem inoperable for reasons other than Condition A or B.	C.1 Restore SPMU subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 4.	12 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Drywell air lock inoperable for reasons other than Condition A or B.	C.1	Verify a door is closed.	1 hour
	AND		
	C.2	Restore air lock to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.5.3 Drywell Isolation Valves

LCO 3.6.5.3 Each drywell isolation valve, except for Drywell Vacuum Relief System valves, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTES----------

1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each penetration flow path.
3. Enter applicable Conditions and Required Actions for systems made inoperable by drywell isolation valves.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one drywell isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	8 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

3.7 PLANT SYSTEMS

3.7.1 Standby Service Water (SSW) System and Ultimate Heat Sink (UHS)

LCO 3.7.1 Division 1 and 2 SSW subsystems and the UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One UHS cooling tower with one cooling tower fan inoperable.	A.1 Restore UHS cooling tower fan to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
B. One UHS cooling tower with two cooling tower fans inoperable.	B.1 Declare associated SSW subsystem inoperable.	Immediately
C. UHS basin level not within limit.	C.1 Restore UHS basin level to within limit.	72 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One SSW subsystem inoperable.	----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for diesel generator made inoperable by SSW. 2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by SSW. ---------- D.1 Restore SSW subsystem to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk Informed Completion Time Program
E. Required Action and associated Completion Time of Condition A, C, or D not met.	E.1 ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	Restore required offsite circuit to OPERABLE status.	72 hours OR In accordance with the Risk Informed Completion Time Program AND 24 hours or in accordance with the Risk Informed Completion Time Program from discovery of two divisions with no offsite power
B. One required DG inoperable for reasons other than Condition F.	B.1	Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND B.2	Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3.1 Determine OPERABLE DG(s) are not inoperable due to common cause failure. OR B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s). AND B.4 Restore required DG to OPERABLE status.	24 hours 24 hours 72 hours or in accordance with the Risk Informed Completion Time Program from discovery of an inoperable Division 3 DG AND 14 days OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two required offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable. AND	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)
	C.2 Restore one required offsite circuit to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
D. One required offsite circuit inoperable for reasons other than Condition F. AND One required DG inoperable for reasons other than Condition F.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems-Operating," when any required division is de-energized as a result of Condition D. ---------- D.1 Restore required offsite circuit to OPERABLE status. OR	12 hours OR In accordance with the Risk Informed Completion Time Program
	D.2 Restore required DG to OPERABLE status.	12 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two required DGs inoperable.	E.1 Restore one required DG to OPERABLE status.	2 hours OR 24 hours if Division 3 DG is inoperable
F. One automatic load sequencer inoperable.	F.1 Restore automatic load sequencer to OPERABLE status.	24 hours OR In accordance with the Risk Informed Completion Time Program
G. Required Action and associated Completion Time of Condition A, B, C, D, E, or F not met.	G.1 ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	 12 hours

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The Division 1, Division 2, and Division 3 DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required battery charger inoperable.	----------NOTE---------- Entry into MODE 1, 2 or 3 is not allowed, except during power reductions. ---------- A.1 Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	1 hour <u>AND</u> Once per 8 hours thereafter
B. Required Action and associated Completion Time of Condition A not met.	B.1 Declare associated battery inoperable.	Immediately
C. Division 1 or 2 DC electrical power subsystem inoperable for reasons other than Condition A.	C.1 Restore Division 1 and 2 DC electrical power subsystems to OPERABLE status.	2 hours <u>OR</u> In accordance with the Risk Informed Completion Time Program

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Distribution Systems—Operating

LCO 3.8.7 Division 1, Division 2, and Division 3 AC and DC electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

----------NOTE----------
Division 3 electrical power distribution subsystems are not required to be OPERABLE when High Pressure Core Spray System is inoperable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Division 1 or 2 AC electrical power distribution subsystem(s) inoperable.	A.1 Restore Division 1 and 2 AC electrical power distribution subsystems to OPERABLE status.	8 hours OR In accordance with the Risk Informed Completion Time Program
B. One or more Division 1 or 2 DC electrical power distribution subsystem(s) inoperable.	B.1 Restore Division 1 and 2 DC electrical power distribution subsystems to OPERABLE status.	2 hours OR In accordance with the Risk Informed Completion Time Program

(continued)

5.5 Programs and Manuals

5.5.13 Control Room Envelope Habitability Program (continued)

1. Plant maintenance activities such as modifications, rework, and preventive maintenance tasks on components that could affect the CRE shall be controlled under fleet, plant and system specific procedures to ensure that the CRE boundary is not degraded by such activities.

2. Testing of CRFA system sealing areas shall be performed following maintenance activities (rework and preventative) and periodically to ensure that the areas of negative pressures do not leak bypassing emergency filtration system components.

3. Fire damper inspection procedures that require opening of duct panels and doors shall ensure that upon restoration no leakage path exists.

4. The remainder of ducting components such as plenum access doors, duct access doors (rectangular and round), flex connections (ventglass, etc), plugs, and patches will be maintained per paragraph b.

5. An assessment of the CRE Boundary will be conducted at a frequency in accordance with the Surveillance Frequency Control Program. The results of assessing items 1 through 4 shall be trended and used as part of the assessment of the CRE boundary as indicated in paragraph c.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and assessing the CRE boundary as required by paragraphs c and d, respectively.

5.5.14 Risk Informed Completion Time Program

This program provides controls to calculate a Risk Informed Completion Time (RICT) and must be implemented in accordance with NEI 06-09-A, Revision 0, "Risk-Managed Technical Specifications (RMTS) Guidelines." The program shall include the following:

a. The RICT may not exceed 30 days;

b. A RICT may only be utilized in MODES 1 and 2;

5.5 Programs and Manuals

5.5.14 Risk Informed Completion Time Program (continued)

c. When a RICT is being used, any change to the plant configuration, as defined in NEI 06-09-A, Appendix A, must be considered for the effect on the RICT.

1. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration.

2. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

3. Revising the RICT is not required if the plant configuration change would lower plant risk and would result in a longer RICT.

d. For emergent conditions, if the extent of condition evaluation for inoperable structures, systems, or components (SSCs) is not complete prior to exceeding the Completion Time, the RICT shall account for the increased possibility of common cause failure (CCF) by either:

1. Numerically accounting for the increased possibility of CCF in the RICT calculation; or

2. Risk Management Actions (RMAs) not already credited in the RICT calculation shall be implemented that support redundant or diverse SSCs that perform the function(s) of the inoperable SSCs, and, if practicable, reduce the frequency of initiating events that challenge the functions(s) performed by the inoperable SSCs.

e. The risk assessment approaches and methods shall be acceptable to the NRC. The plant PRA shall be based on the as-built, as- operated, and maintained plant; and reflect the operating experience at the plant, as specified in Regulatory Guide 1.200, Revision 2. Methods to assess the risk from extending the Completion Times must be PRA methods approved for use with this program in Amendment No. 234, or other methods approved by the NRC for generic use; and any change in the PRA methods to assess risk that are outside these approval boundaries require prior NRC approval.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 234 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 application dated June 6, 2023, (Reference 1), as supplemented by letters dated May 1, 2024 (Reference 2), and June 13, 2024 (Reference 3), Entergy Operations, Inc. (Entergy, the licensee) submitted a license amendment request (LAR) for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf).

The amendment would revise technical specification (TS) requirements to permit the use of risk-informed completion times (RICTs) for actions to be taken when limiting conditions for operation (LCOs) are not met. The proposed changes are based on Technical Specifications Task Force (TSTF) Traveler TSTF-505, Revision 2, "Provide Risk-Informed Extended Completion Times – RITSTF [Risk-Informed TSTF] Initiative 4b," dated July 2, 2018 (Reference 4). The U.S. Nuclear Regulatory Commission (NRC, the Commission) issued a final model safety evaluation (SE) approving TSTF-505, Revision 2, on November 21, 2018 (Reference 5).

The licensee has proposed variations from the TS changes described in TSTF-505, Revision 2, which are provided in section 2.3 of attachment 1 to the LAR and evaluated in section 3.0 of this SE.

The NRC staff participated in a regulatory audit from December 2023 to June 2024 to ascertain the information needed to support its review of the application and develop requests for additional information, as needed. By letters dated May 1, 2024, and June 13, 2024, the licensee responded to the audit providing additional information associated with NRC questions discussed in the audit. The supplemental letters dated May 1, 2024, and June 13, 2024, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 8, 2023 (88 FR 53541). On June 24, 2024, the NRC staff issued an audit summary (Reference 6).

2.0 REGULATORY EVALUATION

2.1 Regulatory Review

2.1.1 Applicable Regulations

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 provides the general provisions for "Domestic Licensing of Production and Utilization Facilities." Under 10 CFR 50.90, whenever a holder of a license wishes to amend the license, including technical specifications in the license, an application for amendment must be filed, fully describing the changes desired. Under 10 CFR 50.92(a), determinations on whether to grant an applied-for license amendment are to be guided by the considerations that govern the issuance of initial licenses or construction permits to the extent applicable and appropriate. Both the common standards in 10 CFR 50.40(a), and those specifically for issuance of operating licenses in 10 CFR 50.57(a)(3), provide that there must be reasonable assurance that the activities at issue will not endanger the health and safety of the public.

The NRC staff has identified the following applicable sections within 10 CFR Part 50 for the staff's review of a licensee's application to adopt TSTF-505, Revision 2:

- 10 CFR 50.36, "Technical specifications," paragraphs (c)(2), "Limiting conditions for operation," and (c)(5), "Administrative controls"

- 10 CFR 50.55a, "Codes and standards," paragraph (h), "Protection and safety systems"

- 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" (i.e., the Maintenance Rule)

2.1.2 Regulatory Guidance

NRC regulatory guides (RGs) provide one way to ensure that the codified regulations continue to be met. The NRC staff considered the following guidance, and industry guidance endorsed by the NRC, during its review of the proposed changes:

- RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2, March 2009 (Reference 7) and RG 1.200, "Acceptability of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 3, December 2020 (Reference 8).

- RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 2, May 2011 (Reference 9) and Revision 3, January 2018 (Reference 10).

- RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," Revision 1, May 2011 (Reference 11) and RG 1.177, Revision 2, "Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications, January 2021 (Reference 12).

- NUREG-1855, “Guidance on the Treatment of Uncertainties Associated with PRAs [Probabilistic Risk Assessments] in Risk-Informed Decisionmaking,” Revision 1, March 2017 (Reference 13).

- NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition” (SRP), Section 16.1, “Risk-Informed Decision Making: Technical Specifications,” March 2007 (Reference 14), and Section 19.2, “Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance,” June 2007 (Reference 15).

- Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09-A, Revision 0-A (NEI 06-09-A), “Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines” (Reference 16) provides guidance for risk-informed TSs. The NRC staff issued a final model SE approving NEI 06-09 on May 17, 2007 (Reference 17).

The licensee’s submittal cites various revisions of RG 1.200, RG 1.174, and RG 1.177. The RGs have been updated to Revision 3 of RGs 1.200 and 1.174, and Revision 2 for RG 1.177. The updates do not include any technical changes that would impact the consistency with NEI 06-09-A; therefore, the NRC staff finds the updated revisions to the RGs also applicable for use in the licensee’s adoption of TSTF-505, Revision 2.

2.2 Description of the RICT Program

The TS LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO is not met, the licensee must shut down the reactor or follow any remedial or required action (e.g., testing, maintenance, or repair activity) permitted by the TSs until the condition can be met. The remedial actions (i.e., ACTIONS) associated with an LCO contain Conditions that typically describe the ways in which the requirements of the LCO are to be met. Specified with each stated Condition are Required Action(s) and Completion Time(s) (CT). The CTs are referred to as the “front stops” in the context of this SE. For certain conditions, the TSs require exiting the Mode of Applicability of an LCO (i.e., shut down the reactor).

The licensee’s submittal requested approval to add a RICT Program to the Administrative Controls section of the TSs, and modify selected CTs to permit extending the CTs, provided risk is assessed and managed as described in NEI 06-09-A. Consistent with table 1, “Conditions Requiring Additional Technical Justification, NUREG-1434, BWR [Boiling Water Reactor]/6 STS [Standard TS],” of TSTF-505, Revision 2, the licensee provided several plant-specific LCOs and associated Actions for which the licensee proposed to be included in the RICT Program, along with additional justification in section 2.3 of attachment 1 to the LAR. The NRC staff review of these variations and the justification is provided in section 3.0 of this SE.

The licensee is proposing no changes to the design of the plant or any operating parameter, and no changes to the design basis in the proposed changes to the TSs. The effect of the proposed changes, when implemented, will allow CTs to vary based on the risk significance of the given plant configuration (i.e., the equipment out of service (OOS) at any given time), provided that the system(s) retain(s) the capability to perform the applicable safety function(s) without any further failures (e.g., one train of a two-train system is inoperable). These restrictions on inoperability of all required trains of a system ensure that consistency with the

defense-in-depth philosophy is maintained by following existing guidance when the capability to perform TS safety function(s) is lost.

The proposed RICT Program uses plant-specific operating experience for component reliability and availability data. Thus, the allowances permitted by the RICT Program are directly reflective of actual component performance in conjunction with component risk significance.

TS 1.0, “Use and Application”:

The license amendment request, as supplemented, included Example 1.3-8 which will be added to TS 1.3, “Completion Times,” and will read as follows:

EXAMPLE 1.3-8

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Restore subsystem to OPERABLE status.	7 days OR In accordance with the Risk Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

When a subsystem is declared inoperable, Condition A is entered. The 7 day Completion Time may be applied as discussed in Example 1.3-2. However, the licensee may elect to apply the Risk Informed Completion Time Program which permits calculation of a Risk Informed Completion Time (RICT) that may be used to complete the Required Action beyond the 7 day Completion Time. The RICT cannot exceed 30 days. After the 7 day Completion Time has expired, the subsystem must be restored to OPERABLE status within the RICT or Condition B must also be entered.

The Risk Informed Completion Time Program requires recalculation of the RICT to reflect changing plant conditions. For planned changes, the revised RICT must be determined prior to implementation of the change in configuration. For emergent conditions, the revised RICT must be determined within the time limits of the Required Action Completion Time (i.e., not the RICT) or 12 hours after the plant configuration change, whichever is less.

If the 7 day Completion Time clock of Condition A has expired and subsequent changes in plant condition result in exiting the applicability of the Risk Informed Completion Time Program without restoring the inoperable subsystem to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start.

If the RICT expires or is recalculated to be less than the elapsed time since the Condition was entered and the inoperable subsystem has not been restored to OPERABLE status, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the inoperable subsystems are restored to OPERABLE status after Condition B is entered, Condition A is exited, and therefore, the Required Actions of Condition B may be terminated.

3.0 TECHNICAL EVALUATION

An acceptable approach for making risk informed decisions about proposed TS changes, including both permanent and temporary changes, is to demonstrate that the proposed licensing basis changes meet the five key principles provided in section C of RG 1.174, Revision 3 and the three-tiered approach outlined in section C of RG 1.177, Revision 2. These key principles and tiers are:

Principle 1: The proposed licensing basis change meets the current regulations unless it is explicitly related to a requested exemption (i.e., a specific exemption under 10 CFR 50.12).

Principle 2: The proposed licensing basis change is consistent with the defense-in-depth philosophy.

Principle 3: The proposed licensing basis change maintains sufficient safety margins.

Principle 4: When the proposed licensing basis changes result in an increase in risk, the increases should be small and consistent with the intent of the Commission's policy statement on safety goals for the operations of nuclear power plants.

- Tier 1: PRA Capability and Insights
- Tier 2: Avoidance of Risk-Significant Plant Configurations
- Tier 3: Risk-Informed Configuration Risk Management

Principle 5: The impact of the proposed licensing basis change should be monitored by using performance measurement strategies.

3.1 Method of NRC Staff Review

Each of the key principles and tiers are addressed in NEI 06-09-A and approved in the final model SE issued by the NRC staff for TSTF-505, Revision 2. NEI 06-09-A provides a methodology for extending existing CTs, and to thereby delay exiting the operational mode of

applicability or taking Required Actions if risk is assessed and managed within the limits and programmatic requirements established by a RICT Program. The NRC staff's evaluation of the licensee's proposed use of RICTs against the key safety principles of RGs 1.174 and 1.177 is discussed below.

3.2 Review of Key Principles

3.2.1 Key Principle 1: Evaluation of Compliance with Current Regulations

Paragraph 50.36(c)(2) of 10 CFR states, in part, that LCOs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."

The CTs in the current TSs were established using experiential data, risk insights, and engineering judgement. The RICT Program provides the necessary administrative controls to permit extension of CTs and, thereby, delay reactor shutdown or Required Actions if risk is assessed and managed appropriately within specified limits and programmatic requirements, and safety margins and defense-in-depth remain sufficient. The option to determine the extended CT in accordance with the RICT Program allows the licensee to perform an integrated evaluation in accordance with the methodology described in NEI 06-09-A and proposed TS 5.5.14, "Risk Informed Completion Time Program." The RICT is limited to a maximum of 30 days (termed the "backstop").

The typical CT is modified by the application of the RICT Program as shown in the following example. The changed portion is indicated in italics.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One subsystem inoperable.	A.1 Restore subsystem to OPERABLE status.	7 days *OR* *In accordance with the Risk Informed Completion Time Program*

In attachment 1, "Description and Assessment"; attachment 4, "Cross-Reference of TSTF-505 and [Grand Gulf] Technical Specifications"; and enclosure 1, "List of Revised Required Actions to Corresponding PRA Functions," to its LAR, as supplemented, the licensee provided a list of the TSs, associated LCOs, and Required Actions for the CTs that included modifications and variations from the approved TSTF-505. The modifications and variations consisted of proposed changes to the Required Actions and CTs. Furthermore, consistent with table 1 of TSTF-505, Revision 2, for Grand Gulf TSs 3.3.4.1.A, 3.3.6.5.A, 3.3.8.1.A, 3.6.1.2.C, 3.6.1.3.D, 3.6.1.7.A, and 3.6.5.2.C, in section 2.0 of enclosure 1 to its LAR, the licensee included additional technical justification to demonstrate the acceptability for including these TSs in the RICT Program. The NRC staff reviewed the proposed changes to the TSs, associated LCOs, Required Actions, and CTs provided by the licensee for the scope of the RICT Program and concluded, with the

incorporation of the RICT Program, that the required performance levels of equipment specified in LCOs are not changed and only the required CTs for the Required Actions are modified, such that 10 CFR 50.36(c)(2) will remain met.

Based on the discussion provided above, the NRC staff finds that the proposed RICT Program provided in section 2.0 of this SE, LCOs, Required Actions, and CTs meet the first key principle of RGs 1.174 and 1.177.

3.2.2 Key Principle 2: Evaluation of Defense-in-Depth

In RG 1.174, Revision 3, the NRC identified the following considerations used for evaluation of how the licensing basis change is maintained for the defense-in-depth philosophy:

- Preserve a reasonable balance among the layers of defense.
- Preserve adequate capability of design features without an overreliance on programmatic activities as compensatory measures.
- Preserve system redundancy, independence, and diversity commensurate with the expected frequency and consequences of challenges to the system, including consideration of uncertainty.
- Preserve adequate defense against potential CCFs [common-cause failures].
- Maintain multiple fission product barriers.
- Preserve sufficient defense against human errors.
- Continue to meet the intent of the plant's design criteria.

The licensee requested the use of a RICT Program to extend the existing CTs for the respective TS LCOs described in attachment 5, "Evaluation of Instrumentation and Control Systems," to its LAR, as supplemented. For the TS LCOs in the LAR, as supplemented, the licensee provided a description and assessment of the redundancy and diversity for the proposed changes. The NRC staff's evaluation of the proposed changes for these LCOs assessed Grand Gulf's redundant or diverse means to mitigate accidents to ensure consistency with the plant licensing basis requirements using the guidance described in RG 1.174, RG 1.177, and TSTF-505, to ensure adequate defense-in-depth (for each of the functions) to operate the facility in the proposed manner (i.e., that the changes are consistent with the defense-in-depth criteria).

Attachment 5 and enclosure 1 to the LAR, as supplemented, provided information supporting the Grand Gulf evaluation of the redundancy, diversity, and defense-in-depth for each TS LCO and TS Required Action as it relates to instrumentation and control (I&C) and electrical power systems. The NRC staff confirmed that for the following TS LCOs, the above defense-in-depth criteria were applicable, except for the criteria for maintaining multiple fission product barriers.

LCOs related to I&C:

- TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"
- TS 3.3.4.1, "End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation"

- TS 3.3.4.2, “Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation”
- TS 3.3.5.1, “Emergency Core Cooling System (ECCS) Instrumentation”
- TS 3.3.5.3, “Reactor Core Isolation Cooling (RCIC) System Instrumentation”
- TS 3.3.6.1, “Primary Containment and Drywell Isolation Instrumentation”
- TS 3.3.6.3, “Residual Heat Removal (RHR) Containment Spray System Instrumentation”
- TS 3.3.6.5, “Relief and Low-Low Set (LLS) Instrumentation”
- TS 3.3.8.1, “Loss of Power (LOP) Instrumentation”

For the TS LCOs specific to I&C, the NRC staff reviewed the specific trip logic arrangements, redundancy, backup systems, manual actions, and diverse trips specified for each of the protective safety functions and associated instrumentation, as described in the associated updated final safety analysis report (UFSAR) sections (Reference 18), and as reflected in attachment 5 to the LAR for each I&C LCO listed above. Specifically, for TS 3.3.1.1, the NRC staff found that Grand Gulf has redundant and diverse methods of shutting down the reactor in the unlikely event that the RPS does not scram the reactor, and the RPS design creates defense-in-depth from the redundancy of the channels for each trip system.

For TS 3.3.4.1, the EOC-RPT has two identical trip systems, of which either can actuate an RPT. Each EOC-RPT system has a 2-out-of-2 initiation logic for the trip function. If either trip system actuates, both recirculation pumps will trip. Therefore, the EOC-RPT design has the defense-in-depth from the redundancy of trip systems for the trip function. For TS 3.3.4.2, the NRC staff verified that the ATWS-RPT consists of two independent trip systems, which creates the defense-in-depth from the redundancy of trip systems for the trip function.

For TS 3.3.5.1, the NRC staff reviewed the design of the ECCS instrumentation design, which is found to have defense-in-depth from the redundancy of the channels for each trip system performing the ECCS actuation. For TS 3.3.5.3, the NRC staff reviewed the Grand Gulf design and found that it has diverse RCIC system instrumentation inputs and redundant channels for each trip system.

For TS 3.3.6.1, the NRC staff found that Grand Gulf’s design includes diverse primary containment and drywell isolation inputs, which creates the defense-in-depth from the redundancy of the channels for each trip system. For TS 3.3.6.3, the NRC staff verified that the design of the RHR containment spray (CS) system instrumentation has diverse RHR CS system instrumentation inputs and creates the defense-in-depth from the redundancy of the channels for each trip system. For TS 3.3.6.5, the NRC staff found that the Grand Gulf design includes diverse relief and LLS system instrumentation inputs, and the relief instrumentation consists of two trip systems, with each trip system actuating one solenoid for each safety relief valve. Therefore, the relief and LLS instrumentation design has the defense-in-depth from the redundancy of the channels for each trip system.

For TS 3.3.8.1, the NRC staff verified that the design of the LOP instrumentation includes the defense-in-depth from separate loss of voltage or degraded voltage initiation functions.

The NRC staff found that there is no change to the existing I&C system associated with the proposed use of the RICT for each I&C related TS LCO. The NRC staff verified that in accordance with Grand Gulf’s UFSAR, equipment, and actions credited in attachment 5 of the LAR, in all applicable operating modes, the affected protective feature would still perform its intended function by ensuring the ability to detect and mitigate the associated event or accident

when the CT of a channel is extended. Furthermore, the NRC staff finds that there is sufficient redundancy, diversity, and defense-in-depth, to protect against CCFs and potential single failure for the Grand Gulf's I&C systems evaluated in attachment 5 to the LAR during a RICT. There is at least one diverse means specified by the licensee for initiating mitigating action for each accident event, thus providing defense-in-depth against a failure of instrumentation during the RICT for each TS LCO. The defense-in-depth specified by the licensee does not overly rely on manual actions as the diverse means; therefore, there is not overreliance of programmatic activities as compensatory measures. Therefore, the NRC staff finds that the intent of the Grand Gulf plant's design criteria (e.g., safety functions) for the above TS LCOs related to I&C are maintained.

Grand Gulf UFSAR section 8.2, "Offsite Power System," states that the station's electrical power system consists of three offsite circuits (two 500 kilovolt (kV) circuits and one 115 kV circuit), a 500 kV switchyard, service transformers, onsite alternating current (ac) electrical distribution systems, and direct current (dc) power systems. The 115 kV cable feeds a 115 kV/4.16 kV engineered safety features (ESF) transformer located adjacent to the plant. From the switchyard, the voltage of the ac power is stepped down from 500 kV to 34.5 kV through two service transformers and fed to two sets of ESF and balance-of-plant (BOP) transformers. The ESF transformers supply the 4 kV ESF buses with ac power which feed ESF load groups at 4 kV and 480 volts (V). The BOP transformers provide ac power to BOP loads at 13.8, 6.9, 4.16, and 0.48 kV. An alternate source for the Class IE ac power system for each ESF bus is the associated diesel generator set. The Class IE ac power system is divided into three independent divisions to provide ac power to the three divisions of ESF loads. Each division of the Class IE ac power system is provided with an independent Class IE 125-V dc system. The BOP loads have several 125-V and 250-V dc systems.

For the TS LCOs specific to electrical power systems, the Grand Gulf UFSAR states that the electrical system is designed with sufficient capacity, independence, and redundancy to ensure that core cooling, containment integrity, and other vital functions are maintained in the event of a postulated accident, assuming a single failure. The design of the onsite and offsite electrical power systems provides compatible independence and redundancy to ensure an available source of power to these engineered safety loads. Single failure requirements are typically suspended for the time that a plant is not meeting an LCO (i.e., in an ACTION statement).

The NRC staff reviewed the information the licensee provided in the LAR, as supplemented, for the proposed TS LCOs, TS Bases, and the UFSAR to verify the capability and capacity of the affected electrical power systems to perform their safety functions (assuming no additional failures) is maintained. The staff verified that the design success criteria for the affected TS LCO reflect the redundant or absolute minimum electrical power source/subsystem required to be operable to support the safety functions necessary to mitigate postulated design-basis accidents (DBAs), safely shutdown the reactor, and maintain the reactor in a safe shutdown condition. In addition, the staff reviewed the risk management action (RMA) examples, which provide reasonable assurance that the appropriate RMAs will be implemented to monitor and control risk. The staff finds that the intent of the plant's design criteria (e.g., safety functions) applicable to the TS LCOs related to electrical power systems are maintained.

The NRC staff notes that while in a TS LCO condition, the redundancy of the electrical equipment will be temporarily reduced and, consequently, the system reliability will be degraded accordingly. The staff examined the design information from the Grand Gulf UFSAR and the proposed risk-informed TS LCO conditions for the affected safety functions. Based on the information provided in the LAR, as supplemented, the staff confirmed that during the proposed

completion time extensions, there are sufficient electrical power sources to support the safety functions necessary to mitigate the DBAs evaluated in the Grand Gulf UFSAR, safely shutdown the reactor, and maintain the reactor in a safe shutdown condition. Therefore, the affected protective features maintain adequate defense-in-depth.

Considering that the proposed CT extensions will be implemented in accordance with the NEI 06-09-A guidance, which also considers RMAs and the redundancy of the offsite and onsite power systems, the NRC staff finds that the plant would maintain adequate defense-in-depth. Therefore, the staff finds the TS LCOs associated with the electrical power systems proposed by the licensee in the LAR, as supplemented, are acceptable for the RICT Program.

The NRC staff reviewed all TS LCOs proposed by the licensee in attachment 5 to its LAR, as supplemented, and concludes that the proposed changes do not alter the ways in which the Grand Gulf systems fail, do not introduce new CCF modes, and the system independence is maintained.

The NRC staff finds that some proposed changes to the TS potentially allow for continued full power operation for longer times with redundant systems inoperable. This might reduce the level of defense-in-depth against some CCFs. However, such reductions are acceptable due to existing diverse means available to maintain adequate defense-in-depth against a potential common-cause failure during a RICT. The NRC staff finds that determining the selected CTs with the RICT Program while maintaining the capability of the system to perform its safety function, is an acceptable reduction in defense-in-depth during the proposed RICT period provided that the licensee identifies and implements compensatory measures in accordance with the RICT Program during the extended CT.

Based on the above, the NRC staff finds that the licensee's proposed changes are consistent with the NRC endorsed guidance prescribed in NEI 06-09-A and satisfy the second key principle in RG 1.174 and RG 1.177. Additionally, the staff concludes that the changes are consistent with the defense-in-depth philosophy as described in RG 1.174.

3.2.3 Key Principle 3: Evaluation of Safety Margins

Paragraph 50.55a(h) of 10 CFR requires in part, that "[p]rotection systems of nuclear power reactors of all types must meet the requirements specified in this paragraph." Section 2.2.2, "Technical Specification Change Maintains Sufficient Safety Margin (Principal 3)," of RG 1.177, Revision 2, states, in part, that sufficient safety margins are maintained when:

a. Codes and standards… or alternatives approved for use by the NRC are met….

b. Safety analysis acceptance criteria in the final safety analysis report are met, or proposed revisions provide sufficient margin to account for analysis and data uncertainties….

The licensee is not proposing in this application to change any quality standard, material, or operating specification. In the LAR, as supplemented, the licensee proposed to add a new program, "Risk Informed Completion Time Program," in section 5.0, "Administrative Controls," of the Grand Gulf TSs, which requires adherence to NEI 06-09-A.

The NRC staff evaluated the effect on safety margins when the RICT is applied to extend the CT up to a backstop of 30 days in a TS condition with sufficient trains remaining operable to fulfill the TS safety function. Although the licensee will be able to have design-basis equipment OOS longer than the current TSs allow, any increase in unavailability is expected to be relatively small and is addressed by the consideration of the single failure criterion in the design-basis analyses. Acceptance criteria for operability of equipment are not changed and ensure sufficient trains remain operable to fulfill the TS safety function, (i.e., the operability of the remaining train(s) will ensure that the current safety margins are maintained). The staff finds that when the specified TS safety function remains feasible, sufficient safety margins would be maintained during the extended CT of the RICT Program.

Safety margins are also maintained if PRA functionality is determined for the inoperable train, which would result in an increased CT. Credit for PRA functionality, as described in NEI 06-09-A, is limited to the inoperable train, loop, or component.

Based on the above, the NRC staff finds that the design-basis analyses for Grand Gulf remain applicable and unchanged, that sufficient safety margins would be maintained during the extended CT, and that the proposed changes to the TSs do not include any change in the standards applied or the safety analysis acceptance criteria. The staff finds that the proposed changes meet 10 CFR 50.55a(h), and therefore the third key principle of RGs 1.174 and 1.177.

3.2.4 Key Principle 4: Change in Risk Consistent with the Safety Goal Policy Statement

NEI 06-09-A provides a methodology for a licensee to evaluate and manage the risk impact of extensions to TS CTs. Permanent changes to the fixed TS CTs are typically evaluated by using the three-tiered risk-informed approach described in section 16.1 of the SRP, RG 1.174, and RG 1.177. This approach addresses the calculated change in risk as measured by the change in core damage frequency (CDF) and large early release frequency (LERF), as well as the incremental conditional core damage probability and incremental conditional large early release probability; the use of compensatory measures to reduce risk; and the implementation of a configuration risk management program (CRMP) to identify risk-significant plant configurations.

The NRC staff evaluated the licensee's processes and methodologies for determining that the change in risk from implementation of RICTs will be small and consistent with the intent of the Commission's Safety Goal Policy Statement.[1] In addition, the staff evaluated the licensee's proposed changes against the three-tiered approach in RG 1.177, Revision 2, for the licensee's evaluation of the risk associated with a proposed TS CT change. The results of the staff's review are discussed below.

3.2.4.1 Tier 1: PRA Capability and Insights

Tier 1 evaluates the impact of the proposed changes on plant operational risk. The Tier 1 review involves two aspects: (1) scope and acceptability of the PRA models and their application to the proposed changes, and (2) a review of the PRA results and insights described in the licensee's application.

[1] Commission's Safety Goal Policy Statement, "Safety Goals for the Operations of Nuclear Power Plants; Policy Statement," published in the *Federal Register* on August 4, 1986 (51 FR 28044), as corrected, and republished, on August 21, 1986 (51 FR 30028).

In enclosure 2, “Information Supporting Consistency with Regulatory Guide 1.200, Revision 2”; and enclosure 4, “Information Supporting Justification of Excluding Sources of Risk Not Addressed by the PRA Models,” to its LAR, as supplemented, the licensee identified the following modeled hazards and alternate methodologies that are proposed to be used in the Grand Gulf RICT Program to assess the risk contribution for extending the CT of a TS LCO.

- Internal Events PRA (IEPRA) model (includes internal flooding)
- Internal Fire Events PRA (FPRA) model
- Seismic Hazard: a CDF penalty of 1.41E-6 per year, and an LERF penalty of 4.04E-7 per year, and
- Other External Hazards: screened out from RICT Program based on appendix 6-A of the American Society of Mechanical Engineers (ASME) / American Nuclear Society (ANS) RA-Sa-2009, “Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications, Addendum A to RA-S-2008,” (ASME/ANS RA-Sa-2009 PRA Standard) (Reference 19).

3.2.4.1.1 Evaluation of Modeled PRAs

In enclosure 2, section 2.0, “PRA Quality/Technical Adequacy,” to its LAR, the licensee states that the Grand Gulf’s IEPRA model (includes internal flooding) received a full-scope peer review in September 2015 using the ASME/ANS RA-Sa-2009 PRA Standard, and RG 1.200, Revision 2. For the open facts and observations (F&Os) resulting in these peer reviews the licensee stated that closure of the F&Os was performed using an independent assessment process. The NRC staff confirmed that the licensee performed closure of the F&Os consistent with Appendix X to NEI 05-04, 07-12, and 12-13 (Reference 20), as endorsed in RG 1.200, Revision 3.

In enclosure 2, section 2.0, of the LAR, the licensee confirmed that the Grand Gulf internal fire events PRA (FPRA) model received a full-scope peer review in July 2022 using NEI 07-12, “Fire Probabilistic Risk Assessment (FPRA) Peer Review Process Guidelines” (Reference 21), the ASME/ANS RA-Sa-2009 PRA Standard, and RG 1.200, Revision 3. After findings from the peer review were addressed in the FPRA model, an independent assessment was performed in April 2023 consistent with RG 1.200, Revision 3. As a result of the F&O closure review, all finding-level F&Os from the peer review were closed, hence, no open F&Os were presented in the LAR. The licensee also states in the LAR, per the conclusions of the independent assessment, that there have been no model changes that constitute a PRA upgrade.

In enclosure 9, “Key Assumptions and Sources of Uncertainty,” to its LAR, as supplemented, the licensee provided a brief discussion and list of the key assumptions and sources of uncertainty, along with treatment for the application of TSTF-505. In enclosure 9, Grand Gulf confirmed that the internal FPRA model takes credit for diverse and flexible coping strategies (FLEX). To address concerns with the methods used to model FLEX equipment and operator actions described in the NRC staff memorandum, “Updated Assessment of Industry Guidance for Crediting Mitigating Strategies in Probabilistic Risk Assessments,” dated May 6, 2022 (Reference 22), the licensee generated a sensitivity study to show the impact of modeling. The results show that there is minimal difference between RICTs calculated for the base case and the sensitivity case. The NRC staff concluded that the PRA modeling of FLEX in the TSTF-505 application is appropriate because the licensee demonstrated that changes in the equipment failure probabilities and human error probabilities have an inconsequential impact on the RICT calculations.

The NRC staff reviewed the PRA models peer review history provided by the licensee in enclosure 2 to its LAR, as supplemented. The licensee adequately applied the guidance for establishing PRA technical acceptability for the aforementioned models. The staff further considered the key assumptions and key sources of uncertainty identified by the licensee, proposed use of surrogates in the PRA models for specific TS functions, and credit for FLEX. Therefore, the staff finds the Grand Gulf scope, and technical acceptability of the PRA modeled internal events (including internal flooding) and fire events to be commensurate with the RICT application for use in the integrated decision-making process consistent with RG 1.174.

The NRC staff finds the Grand Gulf scope of modeled PRA hazards to be commensurate with the RICT application for use in the integrated decision-making process consistent with RG 1.174, Revision 3.

3.2.4.1.2 Evaluation of Seismic Hazard

The licensee's approach for including the seismic risk contribution in the RICT calculation is to add a penalty seismic CDF and a penalty seismic LERF to each RICT calculation. The proposed bounding seismic CDF estimate is based on using the plant-specific seismic hazard curves developed in response to the Near-Term Task Force Recommendation 2.1 (Reference 23), and a plant-level high confidence of low probability of failure (HCLPF) capacity of 0.19g referenced to the peak ground acceleration (PGA). The uncertainty parameter for seismic capacity was represented by a composite variability factor (β_c) of 0.4. The calculated seismic CDF penalty is 1.41E-06 per year, which is determined by averaging the results for 1 hertz (Hz), 5 Hz, and 10 Hz hazard curves. The NRC staff finds that the method to determine the baseline seismic CDF is acceptable because it is consistent with the approach used in NRC Generic Issue (GI)-199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants" (Reference 24), is aligned with the frequency range used to determine the plant-level HCLPF (discussed below), and provides results comparable to the staff's independent verification. In its supplement to the LAR, the licensee explained the basis for using a plant-level HCLPF value of 0.19g instead of that used for GI-199 for Grand Gulf (0.15g). The staff's review finds the use of 0.19g for the plant-level HCLPF to be acceptable for this application, because the licensee used a scaling factor for seismic fragility based on a ratio of plant-specific seismic capacity (SSE) to seismic demand (GMRS) for a frequency range of interest from 1 Hz to 10 Hz.

Concerning the proposed bounding seismic LERF estimate, the licensee explains in the LAR that an estimate of the seismic LERF is obtained by convolving the estimated seismic CDF (as described above) with a limiting fragility for containment integrity of 0.3g PGA HCLPF. The calculated seismic LERF is 4.04E-07 per year. The NRC staff finds that the licensee's approach to estimating the seismic LERF is acceptable because the use of a 0.3g PGA HCLPF as the limiting fragility for containment integrity is conservative.

The licensee addressed the incremental risk associated with a seismic-induced loss-of-offsite-power (LOOP) in section 4.2, "Seismically-Induced Loss of Offsite Power Challenges," of enclosure 4 to the LAR. A seismic LOOP frequency across the entire hazard interval is 5.49E-08 per year, which is less than 7 percent of the total internal events 24-hour non-recovered LOOP frequency of 8.42E-07 per year already addressed in the IEPRA. The NRC staff evaluated the licensee's analysis and finds that it adequately addresses the impact of a seismically-induced LOOP on risk and that the exclusion of the impact of a seismically-induced LOOP on risk from the non-recovered LOOP frequency has an insignificant impact on the RICT calculations.

The NRC staff finds that, during RICTs for structures, systems, and components (SSCs) credited in the design-basis to mitigate seismic events, the licensee's proposed methodology captures the risk associated with seismically-induced failures of redundant SSCs because such SSCs are assumed to be fully correlated. By assuming full correlation, the seismic risk for those RICTs will not increase if one of the redundant SSCs is unavailable because simultaneous failure of all redundant trains would be assumed in a seismic PRA.

During RICTs for SSCs that are not credited in seismic events, the proposed methodology for considering seismic risk contributions is conservative because the seismically-induced failure of such SSCs would not result in a risk increase associated with the plant configuration during the RICT, but the seismic penalty is still included in the calculation. During RICTs for SSCs that are credited in seismic events, the proposed methodology is acceptable for this application because the plant-level HCLPF value used for the RICT calculations provides a conservative estimate of HCLPF values for all the credited SSCs.

In summary, the NRC staff finds that the licensee's proposal to use the seismic CDF contributions of 1.41E-06 per year and a seismic LERF contribution of 4.04E-07 per year to be acceptable for the licensee's RICT Program for Grand Gulf because, (1) the licensee used the most current site-specific seismic hazard information; (2) the licensee used an acceptable approach to determine the plant-level HCLPF value of 0.19g PGA and a composite variability factor of 0.4; (3) the licensee determined a seismic LERF penalty based on its estimate of seismic CDF combined with a conservative containment integrity fragility of 0.3g PGA HCLPF; and (4) adding baseline seismic risk to RICT calculations, which assumes the fully correlated failures, is acceptable for this application.

3.2.4.1.3 Evaluation of Other External Hazards

Besides seismic hazard discussed above, the licensee concluded that other external hazards for Grand Gulf have insignificant contribution and proposed that these hazards be screened out from the RICT Program. The licensee provided its assessment of other external hazard risk for the RICT Program in enclosure 4 to its LAR. The hazards assessed in the LAR are those identified for consideration in non-mandatory appendix 6-A of the ASME/ANS RA-Sa-2009 PRA Standard, which provides a guide for identification of most of the possible external events for a plant site.

The NRC staff reviewed the information in the LAR, as supplemented, and finds that other external hazards, besides seismic, have an insignificant contribution to configuration risk and can be excluded from the calculation of the proposed RICTs because they either do not challenge the plant or they are bounded by the external hazards analyzed for the plant. The staff finds that the licensee appropriately screened out all other external hazards from consideration in the RICT Program because the licensee's preliminary and progressive screening criteria used and presented in table E4-2, "Progressive Screening Approach for Addressing External Hazards," of enclosure 4 to the LAR are the same criteria (i.e., EXT-B1, EXT-B2 and EXT-C1) in the ASME/ANS RA-Sa-2009 PRA Standard for screening external hazards and, therefore, are acceptable.

3.2.4.1.4 Application of PRA Models Results and Insights in the RICT Program

The Grand Gulf base PRA models that have been determined to be acceptable in this SE will be modified as an application-specific PRA model (i.e., CRMP tool) that will be used to analyze the risk for an extended CT. The CRMP model produces results (i.e., risk metrics) that are

consistent with the NEI 06-09-A guidance. In the LAR, as supplemented, the licensee provided all information needed to support the requested LCO actions proposed for the Grand Gulf RICT Program consistent with all the limitations and conditions prescribed in section 4.0 of NEI 06-09-A.

The NRC staff did not identify any insufficiencies in the licensee's information including the proposed Implementation Item Nos 1, 2, and 3, located in Attachment 6 of the licensee's Jun 6, 2023 submittal, to update the PRA modeling and surrogates for LCOs 3.3.1.1 Condition A; 3.3.6.1, Condition A; 3.6.1.2 Condition C; 3.6.1.3 Condition A; 3.6.5.3 Condition A; 3.3.5.1, Condition F (functions 4.d, 5.d) and Condition G (functions 4.h, 5.g), and 3.3.6.5, Condition A. The NRC staff found the proposed LCO surrogates, with the proposed implementation items to update the PRA model, to be acceptable for the RICT Program. The NRC staff also did not identify any insufficiencies in the CRMP tool (Real Time Risk model) as described in the LAR, as supplemented. Furthermore, as indicated in attachment 1 to the LAR, the proposed changes do not change the design, configuration, or method of operation of the plant. The proposed changes do not involve a physical alteration of the facility (no new or different kind of equipment will be installed). The staff finds that the Grand Gulf PRA models and CRMP tool used will continue to reflect the as-built, as-operated plant consistent with RG 1.200, Revision 2, for ensuring PRA acceptability is maintained. Therefore, the staff concludes that the proposed application of the Grand Gulf RICT Program is appropriate for use in the adoption of TSTF-505 for performing RICT calculations.

The licensee provided in enclosure 5 to its LAR, the estimated total CDF and LERF of the base PRA models to demonstrate that Grand Gulf meets the 1E-4/year CDF and 1E-5/year LERF criteria of RG 1.174 consistent with the guidance in NEI 06-09-A and that these guidelines will be satisfied for implementation of a RICT.

The licensee has incorporated NEI 06-09-A into proposed new TS 5.5.14. The estimated current total CDF and LERF for the Grand Gulf PRAs meet the RG 1.174, Revision 3 guidelines; therefore, the NRC staff concludes the PRA results and insights to be used by the licensee in the RICT Program will continue to be consistent with NEI 06-09-A.

Based on the above conclusions, the NRC staff finds that the licensee has satisfied the intent of RGs 1.174 and 1.177 for determining the PRA acceptable. Both the scope of the PRA models (internal events including flooding and fire and seismic) and evaluation of risk from modeled hazards and other external hazards are appropriate for this application.

3.2.4.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

As described in RG 1.177, Revision 2, the second tier evaluates the capability of the licensee to identify and avoid risk-significant plant configurations that could result if equipment, in addition to that associated with the proposed change, is taken OOS simultaneously or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. In section 2.0, "RICT Program and Procedures," of enclosure 10, "Program Implementation," to its LAR, the licensee confirmed that the risk thresholds associated with 10 CFR 50.65(a)(4) will be coordinated with the RICT limits.

Enclosure 12, "Risk Management Action Examples," to the LAR identifies three kinds of RMAs (i.e., actions to provide increased risk awareness and control, actions to reduce the duration of maintenance activities, and actions to minimize the magnitude of the risk increase). In the LAR, the licensee also explains that RMAs will be implemented, in accordance with current plant

procedures, no later than the time at which the 1E-06 incremental core damage probability or 1E-07 incremental large early release probability thresholds is reached and under emergent conditions when the instantaneous CDF and LERF thresholds are exceeded.

NEI 06-09-A requires the establishment of limits for entry into a RICT and implementation of RMAs. The RICT Program includes these requirements. The proposed changes are thus consistent with NEI-06-09-A, and, therefore, are consistent with the intent of the Tier 2 guidance in RG 1.177, Revision 2, and the licensee's Tier 2 program is acceptable and supports the proposed implementation of the RICT Program.

3.2.4.3 Tier 3: Risk-Informed Configuration Risk Management

Tier 3 of RG 1.177 stipulates that a licensee should develop a program that ensures that the risk impact of OOS equipment is appropriately evaluated prior to performing any maintenance activity.

The proposed RICT Program establishes a CRMP based on the underlying PRA models. The CRMP is then used to evaluate configuration-specific risk for planned activities associated with the RMTS extended CT, as well as emergent conditions which may arise during an extended CT. This required assessment of configuration risk, along with the implementation of compensatory measures and RMAs, is consistent with the principle of Tier 3 for assessing and managing the risk impact of OOS equipment.

Paragraph 50.36(c)(5) of 10 CFR identifies administrative controls as "the provisions relating to organization and management, procedures, […thereby] to assure operation of the facility in a safe manner." In enclosure 8, "Attributes of the Real-Time Model," to its LAR, the licensee confirmed that future changes made to the baseline PRA models and changes made to the online model (i.e., CRMP) are controlled and documented by plant procedures. Enclosure 10 to the LAR provided the attributes that the licensee's RICT Program procedures will address, which are consistent with NEI 06-09-A. The NRC staff finds that the licensee has identified appropriate administrative controls consistent with NEI 06-09-A and 10 CFR 50.36(c)(5).

Based on the licensee's incorporation of NEI 06-09-A in the TSs, as discussed in LAR attachment 1; its use of RMAs as discussed in LAR enclosure 12; and because the proposed changes are consistent with the Tier 3 guidance of RG 1.177, the NRC staff finds the licensee's Tier 3 program is acceptable and supports the proposed implementation of the RICT Program.

3.2.4.4 Key Principle 4 Conclusions

The licensee has demonstrated the technical acceptability and scope of its PRA models and alternative methods. This includes consideration of the impact of seismic events, and other external hazards, and that the models can support implementation of the RICT Program for determining extensions to CTs. The licensee has made proper consideration of key assumptions and sources of uncertainty. The risk metrics are consistent with the approved methodology of NEI 06-09-A and the acceptance guidance in RGs 1.174 and 1.177. The RICT Program will be controlled administratively through plant procedures and training and follows the NRC approved methodology in NEI 06-09-A. The NRC staff finds that the RICT Program satisfies the fourth key principle of RG 1.177 and is, therefore, acceptable.

3.2.5 Key Principle 5: Performance Measurement Strategies – Implementation and Monitoring

RG 1.177, Revision 2, and RG 1.174, Revision 3, establish the need for an implementation and monitoring program to ensure that extensions to TS CTs do not degrade operational safety over time and that no adverse degradation occurs due to unanticipated degradation or common-cause mechanisms. In enclosure 11, "Monitoring Program," to its LAR, the licensee states that the SSCs in the scope of the RICT Program are also in the scope of 10 CFR 50.65 for the Maintenance Rule. The Maintenance Rule monitoring programs will provide for evaluation and disposition of unavailability impacts, which may be incurred from implementation of the RICT Program. Furthermore, in enclosure 11 to its LAR, the licensee confirmed that the cumulative risk is calculated at least every refueling cycle, but the recalculation period does not exceed 24 months, which is consistent with NEI 06-09-A.

The NRC staff finds that the RICT Program satisfies the fifth key principle of RG 1.177 and RG 1.174 because: (1) the RICT Program will monitor the average annual cumulative risk increase as described in NEI 06-09-A, and thereby ensuring the program, as implemented, continues to meet RG 1.174 guidance for small risk increases; and (2) all affected SSCs are within the Maintenance Rule program, which is used to monitor changes to the reliability and availability of these SSCs.

3.3 Technical Conclusion

The NRC staff has evaluated the proposed changes against each of the five key principles in RGs 1.174 and 1.177, including the optional variations from the approved TSTF-505 discussed in section 3.0 of this SE. The staff concludes that the changes proposed by the licensee satisfy the key principles of risk-informed decision-making identified in RG 1.174, and RG 1.177 and, therefore, the requested adoption of the proposed changes to the TSs and associated guidance, is acceptable to assure the regulatory requirements of 10 CFR Part 50 identified in section 2.1 of this SE will continue to be met.

3.4 Editorial Change to Correct a Typographical Error

During the review of this LAR, the NRC staff found that in paragraph 5.5.13, "Control Room Envelope Habitability Program," on page 5.0-16b of the Renewed Facility Operating License NPF-29 for Grand Gulf, paragraph e contains a typographical error which changes the acronym from "DBA" to "OBA." The staff has confirmed that this typographical error was inadvertently introduced when issuing Amendment No. 227 (Reference 25) to RFOL NPF-29 for Grand Gulf and was not included in the licensee's original submittal dated February 19, 2024 (Reference 26), as supplemented by letter dated June 26, 2020 (Reference 27).

The typographical error is addressed by correcting the error and replacing the current page 5.0-16b in conjunction with the issuance Amendment No. 234 of RFOL NPF-29 for Grand Gulf. The corrections do not change any of the conclusions in the safety evaluations or no significant hazards consideration determination associated with Amendment No. 227 or Amendment No. 234.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment on June 20, 2024. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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, and there has been no public comment on such finding published in the *Federal Register* on August 8, 2023 (88 FR 53541). 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.

6.0 CONCLUSION

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

7.0 REFERENCES

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Date: July 29, 2024

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - ISSUANCE OF AMENDMENT NO. 234 - RE: REVISION TO TECHNICAL SPECIFICATIONS TO ADOPT TSTF-505, REVISION 2, "PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES – RITSTF INITIATIVE 4b" (EPID L-2023-LLA-0081) DATED JULY 29, 2024

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