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

May 2, 2022

Mr. John A. Krakuszeski
Site Vice President
Brunswick Steam Electric Plant
Duke Energy Progress, LLC
8470 River Rd., SE (M/C BNP001)
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 308 AND 336 REGARDING THE ADOPTION OF TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER TSTF-505, REVISION 2 (EPID L-2021-LLA-0060)

Dear Mr. Krakuszeski:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 308 and 336 to Renewed Facility Operating License Nos. DPR-71 and DPR-62 for the Brunswick Steam Electric Plant, Units 1 and 2, respectively. These license amendments consist of changes to the technical specifications (TS) in response to your application dated April 1, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21091A053), as supplemented by letters dated April 26, 2021 (ADAMS Accession No. ML21116A161), November 1, 2021 (ADAMS Accession No. ML21305A891), and March 25, 2022 (ADAMS Accession No. ML22084A620).

The amendments modified TS requirements to permit the use of risk-informed completion times in accordance with Technical Specification Task Force (TSTF) Traveler TSTF-505, Revision 2, “Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b.”

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

If you have any questions, please contact me at (301) 415-0272 or by e-mail at Lucas.Haeg@nrc.gov.

Sincerely,

/RA/

Luke Haeg, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos.: 50-325 and 50-324

Enclosures:
1. Amendment No. 308 to DPR-71
2. Amendment No. 336 to DPR-62
3. Safety Evaluation

cc: Listserv

DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 308
Renewed License No. DPR-71

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

   A. The application for amendment filed by Duke Energy Progress, LLC (the licensee), dated April 1, 2021, as supplemented by letters dated April 26, 2021, November 1, 2021, and March 25, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-71 is hereby amended to read as follows:

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

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 180 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

David J. Wrona

Digitally signed by David J. Wrona
Date: 2022.05.02 12:56:52 -04'00'

David J. Wrona, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachments:
Changes to the Renewed Facility Operating License and Technical Specifications

Date of Issuance: May 2, 2022

ATTACHMENT TO LICENSE AMENDMENT NO. 308

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace page 6 of Renewed Facility Operating License No. DPR-71 with the attached page 6.

Replace the following pages of 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.

REMOVE	INSERT	REMOVE	INSERT
1.3-13	1.3-13	3.6-7	3.6-7
--------	1.3-14	3.6-8	3.6-8
3.1-20	3.1-20	3.6-9	3.6-9
3.3-1	3.3-1	3.6-16	3.6-16
3.3-2	3.3-2	3.6-18	3.6-18
3.3-24	3.3-24	3.6-19	3.6-19
3.3-32	3.3-32	3.6-24	3.6-24
3.3-36	3.3-36	3.7-1	3.7-1
3.3-37	3.3-37	3.7-2	3.7-2
3.3-38	3.3-38	3.7-3	3.7-3
3.3-39	3.3-39	3.7-4	3.7-4
--------	3.3-39a	3.7-5	3.7-5
--------	3.3-39b	3.7-6	3.7-6
3.3-40	3.3-40	3.7-7	3.7-7
3.3-45	3.3-45	3.7-20	3.7-20
3.3-46	3.3-46	3.8-3	3.8-3
3.3-49	3.3-49	3.8-4	3.8-4
3.3-50	3.3-50	3.8-5	3.8-5
3.3-51	3.3-51	3.8-6	3.8-6
3.5-1	3.5-1	3.8-7	3.8-7
3.5-2	3.5-2	3.8-23	3.8-23
3.5-3	3.5-3	3.8-34	3.8-34
3.5-4	3.5-4	3.8-35	3.8-35
--------	3.5-4a	3.8-36	3.8-36
3.5-13	3.5-13	5.0-17a	5.0-17a
3.6-5	3.6-5	--------	5.0-17b

(c) Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.

2. The licensee shall implement the modifications to its facility, as described in Table S-1, "Plant Modifications Committed," of Duke letter BSEP 14-0122, dated November 20, 2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the startup of the second refueling outage for each unit after issuance of the safety evaluation. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

3. The licensee shall complete all implementation items, except item 9, listed in LAR Attachment S, Table S-2, "Implementation Items," of Duke letter BSEP 14-0122, dated November 20, 2014, within 180 days after NRC approval unless the 180th day falls within an outage window; then, in that case, completion of the implementation items, except item 9, shall occur no later than 60 days after startup from that particular outage. The licensee shall complete implementation of LAR Attachment S, Table S-2, Item 9, within 180 days after the startup of the second refueling outage for each unit after issuance of the safety evaluation.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level
The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2923 megawatts thermal.

(2) Technical Specifications
The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 203 to Renewed Facility Operating License DPR-71, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 203. For SRs that existed prior to Amendment 203, including SRs with modified acceptance criteria and SRs whose frequency of

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7 (continued)

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.	6 hours
	AND		
	B.2	Be in MODE 5.	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

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-8 (continued)

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. One SLC subsystem inoperable.	A.1 Restore SLC subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Two SLC subsystems inoperable.	B.1 Restore one SLC subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program

(continued)

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.	12 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>	
	A.2 --------------NOTE------------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ----------------------------------- Place associated trip system in trip.	12 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ------------NOTE---------------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ------------------------------------ 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.	6 hours OR In accordance with the Risk-Informed Completion Time Program
	OR		
	B.2	Place one trip system in trip.	6 hours OR In accordance with the Risk-Informed Completion Time Program
C. One or more Functions with RPS trip capability not maintained.	C.1	Restore RPS trip capability.	1 hour
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Enter the Condition referenced in Table 3.3.1.1-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	E.1	Reduce THERMAL POWER to < 26% RTP.	4 hours

(continued)

3.3 INSTRUMENTATION

3.3.2.2 Feedwater and Main Turbine High Water Level Trip Instrumentation

LCO 3.3.2.2 Three channels of feedwater and main turbine high water level trip instrumentation shall be OPERABLE.

APPLICABILITY: THERMAL POWER $\geq$ 23% RTP.

ACTIONS

--NOTE--

Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One feedwater and main turbine high water level trip channel inoperable.	A.1 Place channel in trip.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Two or more feedwater and main turbine high water level trip channels inoperable.	B.1 Restore feedwater and main turbine high water level trip capability.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to < 23% RTP.	4 hours

3.3 INSTRUMENTATION

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

LCO 3.3.4.1 Two channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE:

a. Reactor Vessel Water Level—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 OR In accordance with the Risk-Informed Completion Time Program
	OR	
	A.2 -------------NOTE------------- Not applicable if inoperable channel is the result of an inoperable breaker. ---------------------------------- Place channel in trip.	14 days OR 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 Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	<u>AND</u>	
	B.3 Place channel in trip.	24 hours <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- 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, 2.d, and 2.f. ---------------------------------- 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
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2	Restore channel to OPERABLE status.	24 hours OR ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- 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 HPCI pump suction is not aligned to the suppression pool. ----------------------------------- Declare HPCI System inoperable.	 1 hour from discovery of loss of HPCI initiation capability
	AND		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.2.1	Place channel in trip.	24 hours OR ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program
	OR		
	D.2.2	Align the HPCI pump suction to the suppression pool.	24 hours
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.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
E. (continued)	E.2 Place channel in trip.	96 hours from discovery of inoperable channel concurrent with HPCI or reactor core isolation cooling (RCIC) inoperable <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program <u>AND</u> 8 days <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	F.1	Declare ADS valves inoperable.	1 hour from discovery of loss of ADS initiation capability in both trip systems
	<u>AND</u>		
	F.2	Restore channel to OPERABLE status.	96 hours from discovery of inoperable channel concurrent with HPCI or RCIC inoperable <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program <u>AND</u> 8 days <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time of Condition B, C, D, E, or F not met.	G.1 Declare associated supported feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 3.c; and (b) for up to 6 hours for Functions other than 3.c provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.3.5.1.3 Calibrate the trip unit.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.4 Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.6 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.2 The RCIC System instrumentation for each Function in Table 3.3.5.2-1 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 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	B.1 Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	<u>AND</u>	
	B.2 Place channel in trip.	24 hours <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs ------------------------- 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 3.3.5.2-1.	C.1	Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	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
	<u>AND</u>		
	D.2.1	Place channel in trip.	24 hours <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs ------------------------- In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>		
	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 Isolation Instrumentation

LCO 3.3.6.1 The primary containment 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 controls.
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.a, 2.b, 6.b, 7.a, and 7.b <u>OR</u> In accordance with the Risk-Informed Completion Time Program <u>AND</u> 24 hours for Functions other than Functions 2.a, 2.b, 6.b, 7.a, and 7.b <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One or more Functions with isolation capability not maintained.	B.1	Restore isolation capability.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Enter the Condition referenced in Table 3.3.6.1-1 for the channel.	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	D.1	Isolate associated main steam line (MSL).	12 hours
	OR		
	D.2.1	Be in MODE 3.	12 hours
	AND		
	D.2.2	Be in MODE 4.	36 hours
E. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	E.1	Be in MODE 2.	6 hours
F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1	Isolate the affected penetration flow path(s).	1 hour
G. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	G.1	Isolate the affected penetration flow path(s).	24 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. Required Action and associated Completion Time for Condition F or G not met. <u>OR</u> As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	H.1 <u>AND</u> H.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 <u>OR</u> I.2	Declare associated standby liquid control subsystem (SLC) inoperable. Isolate the Reactor Water Cleanup (RWCU) System.	1 hour 1 hour
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1	Initiate action to restore channel to OPERABLE status.	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 six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,

MODES 2 and 3, except high pressure coolant injection (HPCI) and 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 HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable. <u>OR</u> One low pressure coolant injection (LPCI) pump in each subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. One LPCI pump inoperable. <u>AND</u> One core spray (CS) subsystem inoperable.	B.1 Restore LPCI pump to OPERABLE status. <u>OR</u>	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Restore CS subsystem to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	12 hours
D. HPCI System inoperable.	D.1 Verify by administrative means RCIC System is OPERABLE. <u>AND</u> D.2 Restore HPCI System to OPERABLE status.	Immediately 14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. HPCI System inoperable. <u>AND</u> One low pressure ECCS injection/spray subsystem is inoperable.	E.1	Restore HPCI System to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>		
	E.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
F. One required ADS valve inoperable.	F.1	Restore required ADS valve to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
G. One required ADS valve inoperable. <u>AND</u> One low pressure ECCS injection/spray subsystem inoperable.	G.1 <u>OR</u>	Restore required ADS valve to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued)	G.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
H. One required ADS valve inoperable. AND HPCI System inoperable.	H.1 Restore required ADS valve to OPERABLE status. OR H.2 Restore HPCI System 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
I. Required Action and associated Completion Time of Condition D, E, F, G, or H not met.	I.1 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
J. Two or more required ADS valves inoperable.	J.1 Be in MODE 3. <u>AND</u> J.2 Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours
K. Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A or B. <u>OR</u> HPCI System and two or more required ADS valves inoperable.	K.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control 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 Coolant Injection System is OPERABLE. AND A.2 Restore RCIC System to OPERABLE status.	Immediately 14 days OR In accordance with the Risk-Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	12 hours

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Lock an OPERABLE door closed.	24 hours
	AND		
	B.3	-------------NOTE-------------- Air lock doors in high radiation areas or areas with limited access due to inerting may be verified locked closed by administrative means. -----------------------------------	
		Verify an OPERABLE door is locked closed.	Once per 31 days
C. Primary containment air lock inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate primary containment overall leakage rate per LCO 3.6.1.1, using current air lock test results.	Immediately
	AND		
	C.2	Verify a door is closed.	2 hours
	AND		
	C.3	Restore air lock to OPERABLE status.	24 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, 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 PCIVs.
4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. --------------NOTE-------------- Only applicable to penetration flow paths with two PCIVs. ----------------------------------- One or more penetration flow paths with one PCIV inoperable except for MSIV leakage not within limit.	A.1 AND	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.	8 hours OR In accordance with the Risk-Informed Completion Time Program (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	------------NOTES------------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured 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 primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days, for isolation devices inside primary containment

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. --------------NOTE-------------- Only applicable to penetration flow paths with two PCIVs. ------------------------------------ One or more penetration flow paths with two PCIVs inoperable except for MSIV leakage not within limit.	B.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.	2 hours
C. --------------NOTE-------------- Only applicable to penetration flow paths with only one PCIV. ------------------------------------ One or more penetration flow paths with one PCIV inoperable.	C.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.	8 hours except for excess flow check valves (EFCVs) AND 12 hours for EFCVs
	AND		
	C.2	------------NOTES------------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------------------------------- Verify the affected penetration flow path is isolated.	Once per 31 days following isolation

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two reactor building-to-suppression chamber vacuum breakers inoperable due to inoperable nitrogen backup subsystems.	D.1	Restore one vacuum breaker to OPERABLE status.	7 days
E. One line with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening for reasons other than Condition C.	E.1	Restore the vacuum breaker(s) to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
F. Required Action and associated Completion Time of Condition E not met.	F.1	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------------- Be in MODE 3.	12 hours
G. Two lines with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening for reasons other than Condition D.	G.1	Restore all vacuum breakers in one line to OPERABLE status.	2 hours
H. Required Action and associated Completion Time of Condition A, B, C, D, F, or G not met.	H.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	H.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Suppression Chamber-to-Drywell Vacuum Breakers

LCO 3.6.1.6 Eight suppression chamber-to-drywell vacuum breakers shall be OPERABLE for opening.

AND

Ten suppression chamber-to-drywell vacuum breakers shall be closed, except when performing their intended function.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required suppression chamber-to-drywell vacuum breaker inoperable for opening.	A.1 Restore one vacuum breaker to OPERABLE status.	72 hours 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. One suppression chamber-to-drywell vacuum breaker not closed.	C.1 Close the open vacuum breaker.	4 hours

(continued)

ACTIONS (continued)

D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	--------------------------------NOTE------------------------------ Not required to be met for vacuum breakers that are open during Surveillances. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program AND Within 6 hours after any discharge of steam to the suppression chamber from any source AND Within 6 hours following an operation that causes any of the vacuum breakers to open

(continued)

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 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1 Two RHRSW subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHRSW pump inoperable.	A.1 Restore RHRSW pump to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One RHRSW subsystem inoperable for reasons other than Condition A.	B.1 -------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System. ----------------------------------	
	Restore RHRSW subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 -------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------	
	Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Both RHRSW subsystems inoperable.	D.1	-------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by RHRSW System. -----------------------------------	
		Restore one RHRSW subsystem to OPERABLE status.	8 hours
E. Required Action and associated Completion Time of Condition D not met.	E.1	Be in MODE 3.	12 hours
	AND		
	E.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.2 Service Water (SW) System and Ultimate Heat Sink (UHS)

LCO 3.7.2 SW System and UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------------NOTE------------- Only applicable when Unit 2 is in MODE 4 or 5. ----------------------------------- One required nuclear service water (NSW) pump inoperable due to an inoperable Unit 2 NSW header.	A.1 --------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for diesel generators (DGs) made inoperable by NSW. ---------------------------------- Restore required NSW pump to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required NSW pump inoperable for reasons other than Condition A.	B.1	--------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.8.1 for DGs made inoperable by NSW. ----------------------------------- Restore required NSW pump to OPERABLE status.	 7 days OR In accordance with the Risk-Informed Completion Time Program
C. One required conventional service water (CSW) pump inoperable.	C.1	Verify the one OPERABLE CSW pump and one OPERABLE Unit 1 NSW pump are powered from separate 4.16 kV emergency buses.	Immediately
	AND		
	C.2	Restore required CSW pump to OPERABLE status.	7 days OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action C.1 and associated Completion Time not met.	D.1	Restore required CSW pump to OPERABLE status.	72 hours
E. Two required CSW pumps inoperable.	E.1	--------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.7.1, "Residual Heat Removal Service Water (RHRSW) System," for RHRSW subsystems made inoperable by CSW. ---------------------------------- Restore one required CSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
F. One required NSW pump inoperable. AND One required CSW pump inoperable.	F.1	Restore required NSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
	OR		
	F.2	Restore required CSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One required NSW pump inoperable. AND Two required CSW pumps inoperable.	G.1 Verify by administrative means that two Unit 1 NSW pumps are OPERABLE.	Immediately
	AND	
	G.2.1 Restore required NSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
	OR	
	G.2.2 Restore one required CSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
H. Water temperature of the UHS > 90.5°F and ≤ 92°F.	H.1 Verify water temperature of the UHS is ≤ 90.5°F averaged over previous 24 hour period.	Once per hour

(continued)

3.7 PLANT SYSTEMS

3.7.6 The Main Turbine Bypass System

LCO 3.7.6 The Main Turbine Bypass System shall be OPERABLE.

<u>OR</u>

The following limits are made applicable:

a. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR;

b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR; and

c. LCO 3.2.3, "LINEAR HEAT GENERATION RATE (LHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 23% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Satisfy the requirements of the LCO.	4 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 23% RTP.	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One offsite circuit inoperable for reasons other than Condition A or B.	C.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours AND Once per 12 hours thereafter
	AND		
	C.2	Declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable.	24 hours from discovery of no offsite power to one 4.16 kV emergency bus concurrent with inoperability of redundant required feature(s)
	AND		
	C.3	Restore offsite circuit to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One DG inoperable for reasons other than Condition B.	D.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours <u>AND</u> Once per 12 hours thereafter
	<u>AND</u>		
	D.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 D concurrent with inoperability of redundant required feature (s)
	<u>AND</u>		
	D.3.1	Determine OPERABLE DG(s) are not inoperable due to common cause failure.	24 hours
	<u>OR</u>		
	D.3.2	Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	<u>AND</u>		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.4	Restore DG to OPERABLE status.	7 days OR In accordance with the Risk-Informed Completion Time Program
E. Two or more offsite circuits inoperable for reasons other than Condition B.	E.1	Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s)
	AND		
	E.2	Restore all but one offsite circuit to OPERABLE status.	24 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One offsite circuit inoperable for reasons other than Condition B. AND One DG inoperable for reasons other than Condition B.	----------------------NOTE------------------- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition F is entered with no AC power source to any 4.16 kV emergency bus. --- F.1 Restore offsite circuit to OPERABLE status. OR F.2 Restore DG to OPERABLE status.	 12 hours OR In accordance with the Risk-Informed Completion Time Program 12 hours OR In accordance with the Risk-Informed Completion Time Program
G. Two or more DGs inoperable.	G.1 Restore all but one DG to OPERABLE status.	2 hours
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F or G not met.	H.1 -------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------- Be in MODE 3.	 12 hours

(continued)

ACTIONS (continued)

I. One or more offsite circuits and two or more DGs inoperable. <u>OR</u> Two or more offsite circuits and one DG inoperable for reasons other than Condition B.	I.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	-------------------------------NOTES------------------------------ 1. All DG starts may be preceded by an engine prelube period. 2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. 3. A single test at the specified Frequency will satisfy this Surveillance for both units. -- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3750 V and ≤ 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The following DC electrical power subsystems shall be OPERABLE:

a. Unit 1 Division I and Division II DC electrical power subsystems; and

b. Unit 2 Division I and Division II DC electrical power subsystems.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1	--------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition A results in de-energization of an AC electrical power distribution subsystem or a DC electrical power distribution subsystem. ----------------------------------- Restore DC electrical power subsystem to OPERABLE status.	7 days <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 I and Division II AC and DC electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One AC electrical power distribution subsystem inoperable for planned maintenance due to either inoperable load group E3 bus(es) or inoperable load group E4 bus(es).	A.1 Restore affected load group bus(es) to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. One or more AC electrical power distribution subsystems inoperable for reasons other than Condition A.	B.1 Restore AC electrical power distribution subsystems to OPERABLE status.	8 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more DC electrical power distribution subsystems inoperable due to loss of normal DC source.	C.1	Declare required feature(s), supported by the inoperable DC electrical power distribution subsystem, inoperable.	Immediately
	<u>AND</u>		
	C.2	Initiate action to transfer DC electrical power distribution subsystem to its alternate DC source.	Immediately
	<u>AND</u>		
	C.3	Declare required feature(s) supported by the inoperable DC electrical power distribution subsystem OPERABLE.	Upon completion of transfer of the required feature's DC electrical power distribution subsystem to its OPERABLE alternate DC source
	<u>AND</u>		
	C.4	Restore DC electrical power distribution subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more DC electrical power distribution subsystems inoperable for reasons other than Condition C.	D.1	Restore DC electrical power distribution subsystems to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
E. Required Action and associated Completion Time of Condition A, B, 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
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1	Enter LCO 3.0.3.	Immediately

5.5.14 Surveillance Frequency Control Program (continued)

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

5.5.15 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 MODE 1 and 2;

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.

(continued)

5.5.15 Risk-Informed Completion Time Program (continued)

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 function(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 used to support Amendment No. 308, 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

DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 336
Renewed License No. DPR-62

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

   A. The application for amendment filed by Duke Energy Progress, LLC (the licensee), dated April 1, 2021, as supplemented by letters dated April 26, 2021, November 1, 2021, and March 25, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-62 is hereby amended to read as follows:

    (2) Technical Specifications

    The Technical Specifications contained in Appendix A, as revised through Amendment No. 336, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 180 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

David J. Wrona

Digitally signed by David J. Wrona
Date: 2022.05.02 12:57:39 -04'00'

David J. Wrona, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachments:
Changes to the Renewed Facility Operating License and Technical Specifications

Date of Issuance: May 2, 2022

ATTACHMENT TO LICENSE AMENDMENT NO. 336

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace page 6 of Renewed Facility Operating License No. DPR-62 with the attached page 6.

Replace the following pages of 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.

REMOVE	INSERT	REMOVE	INSERT
1.3-13	1.3-13	3.6-7	3.6-7
--------	1.3-14	3.6-8	3.6-8
3.1-20	3.1-20	3.6-9	3.6-9
3.3-1	3.3-1	3.6-16	3.6-16
3.3-2	3.3-2	3.6-18	3.6-18
3.3-24	3.3-24	3.6-19	3.6-19
3.3-32	3.3-32	3.6-24	3.6-24
3.3-36	3.3-36	3.7-1	3.7-1
3.3-37	3.3-37	3.7-2	3.7-2
3.3-38	3.3-38	3.7-3	3.7-3
3.3-39	3.3-39	3.7-4	3.7-4
--------	3.3-39a	3.7-5	3.7-5
--------	3.3-39b	3.7-6	3.7-6
3.3-40	3.3-40	3.7-7	3.7-7
3.3-45	3.3-45	3.7-20	3.7-20
3.3-46	3.3-46	3.8-3	3.8-3
3.3-49	3.3-49	3.8-4	3.8-4
3.3-50	3.3-50	3.8-5	3.8-5
3.3-51	3.3-51	3.8-6	3.8-6
3.5-1	3.5-1	3.8-7	3.8-7
3.5-2	3.5-2	3.8-23	3.8-23
3.5-3	3.5-3	3.8-34	3.8-34
3.5-4	3.5-4	3.8-35	3.8-35
--------	3.5-4a	3.8-36	3.8-36
3.5-13	3.5-13	5.0-17a	5.0-17a
3.6-5	3.6-5	--------	5.0-17b

(c) Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.

2. The licensee shall implement the modifications to its facility, as described in Table S-1, "Plant Modifications Committed," of Duke letter BSEP 14-0122, dated November 20, 2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the startup of the second refueling outage for each unit after issuance of the safety evaluation. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.

3. The licensee shall complete all implementation items, except Item 9, listed in LAR Attachment S, Table S-2, "Implementation Items," of Duke letter BSEP 14-0122, dated November 20, 2014, within 180 days after NRC approval unless the 180th day falls within an outage window; then, in that case, completion of the implementation items, except item 9, shall occur no later than 60 days after startup from that particular outage. The licensee shall complete implementation of LAR Attachment S, Table S-2, Item 9, within 180 days after the startup of the second refueling outage for each unit after issuance of the safety evaluation.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level
The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2923 megawatts (thermal).

(2) Technical Specifications
The Technical Specifications contained in Appendix A, as revised through Amendment No. 336, are hereby incorporated in the license. Duke Energy Progress, LLC shall operate the facility in accordance with the Technical Specifications.

For Surveillance Requirements (SRs) that are new in Amendment 233 to Renewed Facility Operating License DPR-62, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 233. For SRs that existed prior to Amendment 233,

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-7 (continued)

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 5.	6 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

(continued)

1.3 Completion Times

EXAMPLES

EXAMPLE 1.3-8 (continued)

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. One SLC subsystem inoperable.	A.1 Restore SLC subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Two SLC subsystems inoperable.	B.1 Restore one SLC subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify available volume of sodium pentaborate solution is within the limits of Figure 3.1.7-1.	In accordance with the Surveillance Frequency Control Program

(continued)

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 A.2 -----NOTE----- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. -------------- 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

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
B.	------------NOTE---------------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ------------------------------------ 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.	6 hours OR In accordance with the Risk-Informed Completion Time Program
		OR		
		B.2	Place one trip system in trip.	6 hours OR In accordance with the Risk-Informed Completion Time Program
C.	One or more Functions with RPS trip capability not maintained.	C.1	Restore RPS trip capability.	1 hour
D.	Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Enter the Condition referenced in Table 3.3.1.1-1 for the channel.	Immediately
E.	As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	E.1	Reduce THERMAL POWER to < 26% RTP.	4 hours

(continued)

3.3 INSTRUMENTATION

3.3.2.2 Feedwater and Main Turbine High Water Level Trip Instrumentation

LCO 3.3.2.2 Three channels of feedwater and main turbine high water level trip instrumentation shall be OPERABLE.

APPLICABILITY: THERMAL POWER ≥ 23% RTP.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One feedwater and main turbine high water level trip channel inoperable.	A.1 Place channel in trip.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Two or more feedwater and main turbine high water level trip channels inoperable.	B.1 Restore feedwater and main turbine high water level trip capability.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Reduce THERMAL POWER to < 23% RTP.	4 hours

3.3 INSTRUMENTATION

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

LCO 3.3.4.1 Two channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE:

a. Reactor Vessel Water Level—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> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u> A.2	-------------NOTE-------------- Not applicable if inoperable channel is the result of an inoperable breaker. ---------------------------------- Place channel in trip.	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 Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND	
	B.3 Place channel in trip.	24 hours OR ---------NOTE--------- Not applicable when a loss of function occurs ------------------------- 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, 2.d, and 2.f. ---------------------------------- 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 ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- 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 HPCI pump suction is not aligned to the suppression pool. ----------------------------------- Declare HPCI System inoperable. AND	 1 hour from discovery of loss of HPCI initiation capability (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.2.1	Place channel in trip.	24 hours OR ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program
	OR		
	D.2.2	Align the HPCI pump suction to the suppression pool.	24 hours
E. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	E.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
E. (continued)	E.2 Place channel in trip.	96 hours from discovery of inoperable channel concurrent with HPCI or reactor core isolation cooling (RCIC) inoperable <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program <u>AND</u> 8 days <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	F.1	Declare ADS valves inoperable.	1 hour from discovery of loss of ADS initiation capability in both trip systems
	AND		
	F.2	Restore channel to OPERABLE status.	96 hours from discovery of inoperable channel concurrent with HPCI or RCIC inoperable OR ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program AND 8 days OR ---------NOTE--------- Not applicable when a loss of function occurs -------------------------- In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Required Action and associated Completion Time of Condition B, C, D, E, or F not met.	G.1	Declare associated supported feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

--NOTES--

1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 3.c; and (b) for up to 6 hours for Functions other than 3.c provided the associated Function or the redundant Function maintains ECCS initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.5.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.3.5.1.3 Calibrate the trip unit.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.4 Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.5 Perform LOGIC SYSTEM FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.1.6 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation

LCO 3.3.5.2 The RCIC System instrumentation for each Function in Table 3.3.5.2-1 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 3.3.5.2-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	B.1 Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	<u>AND</u>	
	B.2 Place channel in trip.	24 hours <u>OR</u> ---------NOTE--------- Not applicable when a loss of function occurs ------------------------- 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 3.3.5.2-1.	C.1	Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	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 ---------NOTE--------- Not applicable when a loss of function occurs ------------------------- In accordance with the Risk-Informed Completion Time Program
	OR		
	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 Isolation Instrumentation

LCO 3.3.6.1 The primary containment 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 controls.
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.a, 2.b, 6.b, 7.a, and 7.b <u>OR</u> In accordance with the Risk-Informed Completion Time Program <u>AND</u> 24 hours for Functions other than Functions 2.a, 2.b, 6.b, 7.a, and 7.b <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more Functions with isolation capability not maintained.	B.1 Restore isolation capability.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Enter the Condition referenced in Table 3.3.6.1-1 for the channel.	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	D.1 Isolate associated main steam line (MSL). <u>OR</u> D.2.1 Be in MODE 3. <u>AND</u> D.2.2 Be in MODE 4.	12 hours 12 hours 36 hours
E. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	E.1 Be in MODE 2.	6 hours
F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1 Isolate the affected penetration flow path(s).	1 hour
G. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	G.1 Isolate the affected penetration flow path(s).	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. Required Action and associated Completion Time for Condition F or G not met. OR As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	H.1	Be in MODE 3.	12 hours
	AND		
	H.2	Be in MODE 4.	36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1	Declare associated standby liquid control subsystem (SLC) inoperable.	1 hour
	OR		
	I.2	Isolate the Reactor Water Cleanup (RWCU) System.	1 hour
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1	Initiate action to restore channel to OPERABLE status.	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 six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,

MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure $\leq$ 150 psig.

ACTIONS

--NOTE--

LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable. <u>OR</u> One low pressure coolant injection (LPCI) pump in each subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. One LPCI pump inoperable. <u>AND</u> One core spray (CS) subsystem inoperable.	B.1 Restore LPCI pump to OPERABLE status. <u>OR</u>	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Restore CS subsystem to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	--------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	12 hours
D. HPCI System inoperable.	D.1	Verify by administrative means RCIC System is OPERABLE.	Immediately
	<u>AND</u>		
	D.2	Restore HPCI System to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. HPCI System inoperable. <u>AND</u> One low pressure ECCS injection/spray subsystem is inoperable.	E.1	Restore HPCI System to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>		
	E.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
F. One required ADS valve inoperable.	F.1	Restore required ADS valve to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
G. One required ADS valve inoperable. <u>AND</u> One low pressure ECCS injection/spray subsystem inoperable.	G.1	Restore required ADS valve to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued)	G.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
H. One required ADS valve inoperable. AND HPCI System inoperable.	H.1 Restore required ADS valve to OPERABLE status. OR H.2 Restore HPCI System 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
I. Required Action and associated Completion Time of Condition D, E, F, G, or H not met.	I.1 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
J. Two or more required ADS valves inoperable.	J.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	J.2	Reduce reactor steam dome pressure to ≤ 150 psig.	36 hours
K. Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A or B. <u>OR</u> HPCI System and two or more required ADS valves inoperable.	K.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control 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 Coolant Injection System is OPERABLE. <u>AND</u> A.2 Restore RCIC System to OPERABLE status.	Immediately 14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------------ Be in MODE 3.	 12 hours

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Lock an OPERABLE door closed.	24 hours
	AND		
	B.3	--------------NOTE------------- Air lock doors in high radiation areas or areas with limited access due to inerting may be verified locked closed by administrative means. ----------------------------------	
		Verify an OPERABLE door is locked closed.	Once per 31 days
C. Primary containment air lock inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate primary containment overall leakage rate per LCO 3.6.1.1, using current air lock test results.	Immediately
	AND		
	C.2	Verify a door is closed.	2 hours
	AND		
	C.3	Restore air lock to OPERABLE status.	24 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, 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 PCIVs.
4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------------NOTE------------- Only applicable to penetration flow paths with two PCIVs. ----------------------------------- One or more penetration flow paths with one PCIV inoperable except for MSIV leakage not within limit.	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. <u>AND</u>	8 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	------------NOTES------------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured 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 primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days, for isolation devices inside primary containment

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. --------------NOTE-------------- Only applicable to penetration flow paths with two PCIVs. ------------------------------------ One or more penetration flow paths with two PCIVs inoperable except for MSIV leakage not within limit.	B.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.	2 hours
C. --------------NOTE-------------- Only applicable to penetration flow paths with only one PCIV. ------------------------------------ One or more penetration flow paths with one PCIV inoperable.	C.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.	8 hours except for excess flow check valves (EFCVs) AND 12 hours for EFCVs
	AND		
	C.2	------------NOTES------------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------------------------------- Verify the affected penetration flow path is isolated.	Once per 31 days following isolation

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two reactor building-to-suppression chamber vacuum breakers inoperable due to inoperable nitrogen backup subsystems.	D.1 Restore one vacuum breaker to OPERABLE status.	7 days
E. One line with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening for reasons other than Condition C.	E.1 Restore the vacuum breaker(s) to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
F. Required Action and associated Completion Time of Condition E not met.	F.1 -------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------- Be in MODE 3.	 12 hours
G. Two lines with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening for reasons other than Condition D.	G.1 Restore all vacuum breakers in one line to OPERABLE status.	2 hours
H. Required Action and associated Completion Time of Condition A, B, C, D, F, or G not met.	H.1 Be in MODE 3. <u>AND</u> H.2 Be in MODE 4.	12 hours 36 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Suppression Chamber-to-Drywell Vacuum Breakers

LCO 3.6.1.6 Eight suppression chamber-to-drywell vacuum breakers shall be OPERABLE for opening.

AND

Ten suppression chamber-to-drywell vacuum breakers shall be closed, except when performing their intended function.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required suppression chamber-to-drywell vacuum breaker inoperable for opening.	A.1 Restore one vacuum breaker to OPERABLE status.	72 hours 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. One suppression chamber-to-drywell vacuum breaker not closed.	C.1 Close the open vacuum breaker.	4 hours

(continued)

ACTIONS (continued)

D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	-------------------------------NOTE------------------------------ Not required to be met for vacuum breakers that are open during Surveillances. --- Verify each vacuum breaker is closed.	In accordance with the Surveillance Frequency Control Program AND Within 6 hours after any discharge of steam to the suppression chamber from any source AND Within 6 hours following an operation that causes any of the vacuum breakers to open

(continued)

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 <u>OR</u> 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 <u>AND</u> D.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

3.7 PLANT SYSTEMS

3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1 Two RHRSW subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHRSW pump inoperable.	A.1 Restore RHRSW pump to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One RHRSW subsystem inoperable for reasons other than Condition A.	B.1	-------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling made inoperable by RHRSW System. ---------------------------------- Restore RHRSW subsystem to OPERABLE status.	 7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------------- Be in MODE 3.	 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Both RHRSW subsystems inoperable.	D.1	-------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling made inoperable by RHRSW System. -----------------------------------	
		Restore one RHRSW subsystem to OPERABLE status.	8 hours
E. Required Action and associated Completion Time of Condition D not met.	E.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	E.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	Verify each RHRSW manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.2 Service Water (SW) System and Ultimate Heat Sink (UHS)

LCO 3.7.2 SW System and UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE------------------- Only applicable when Unit 1 is in MODE 4 or 5. ------------------------------------ One required nuclear service water (NSW) pump inoperable due to an inoperable Unit 1 NSW header.	A.1 --------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for diesel generators (DGs) made inoperable by NSW. ----------------------------------- Restore required NSW pump to OPERABLE status.	14 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One required NSW pump inoperable for reasons other than Condition A.	B.1	--------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.8.1 for DGs made inoperable by NSW. ----------------------------------- Restore required NSW pump to OPERABLE status.	 7 days OR In accordance with the Risk-Informed Completion Time Program
C. One required conventional service water (CSW) pump inoperable.	C.1	Verify the one OPERABLE CSW pump and one OPERABLE Unit 2 NSW pump are powered from separate 4.16 kV emergency buses.	Immediately
	AND		
	C.2	Restore required CSW pump to OPERABLE status.	7 days OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action C.1 and associated Completion Time not met.	D.1	Restore required CSW pump to OPERABLE status.	72 hours
E. Two required CSW pumps inoperable.	E.1	--------------NOTE------------- Enter applicable Conditions and Required Actions of LCO 3.7.1, "Residual Heat Removal Service Water (RHRSW) System," for RHRSW subsystems made inoperable by CSW. ---------------------------------- Restore one required CSW pump to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
F. One required NSW pump inoperable. <u>AND</u> One required CSW pump inoperable.	F.1	Restore required NSW pump to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program
	<u>OR</u>		
	F.2	Restore required CSW pump to OPERABLE status.	72 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One required NSW pump inoperable. AND Two required CSW pumps inoperable.	G.1 Verify by administrative means that two Unit 2 NSW pumps are OPERABLE.	Immediately
	AND	
	G.2.1 Restore required NSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
	OR	
	G.2.2 Restore one required CSW pump to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program
H. Water temperature of the UHS > 90.5°F and ≤ 92°F.	H.1 Verify water temperature of the UHS is ≤ 90.5°F averaged over previous 24 hour period.	Once per hour

(continued)

3.7 PLANT SYSTEMS

3.7.6 The Main Turbine Bypass System

LCO 3.7.6 The Main Turbine Bypass System shall be OPERABLE.

OR

The following limits are made applicable:

LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR;

b. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR; and

c. LCO 3.2.3, "LINEAR HEAT GENERATION RATE (LHGR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ 23% RTP.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Requirements of the LCO not met.	A.1	Satisfy the requirements of the LCO.	4 hours OR In accordance with the Risk-Informed Completion Time Program
B. Required Action and associated Completion Time not met.	B.1	Reduce THERMAL POWER to < 23% RTP.	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One offsite circuit inoperable for reasons other than Condition A or B.	C.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours AND Once per 12 hours thereafter
	AND		
	C.2	Declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable.	24 hours from discovery of no offsite power to one 4.16 kV emergency bus concurrent with inoperability of redundant required feature(s)
	AND		
	C.3	Restore offsite circuit to OPERABLE status.	72 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One DG inoperable for reasons other than Condition B.	D.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	2 hours AND Once per 12 hours thereafter
	AND		
	D.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 D concurrent with inoperability of redundant required feature (s)
	AND		
	D.3.1	Determine OPERABLE DG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	D.3.2	Perform SR 3.8.1.2 for OPERABLE DG(s).	24 hours
	AND		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.4	Restore DG to OPERABLE status.	7 days OR In accordance with the Risk-Informed Completion Time Program
E. Two or more offsite circuits inoperable for reasons other than Condition B.	E.1	Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s)
	AND		
	E.2	Restore all but one offsite circuit to OPERABLE status.	24 hours OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One offsite circuit inoperable for reasons other than Condition B. AND One DG inoperable for reasons other than Condition B.	---------------------NOTE------------------ Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition F is entered with no AC power source to any 4.16 kV emergency bus. -- F.1 Restore offsite circuit to OPERABLE status. OR F.2 Restore DG to OPERABLE status.	 12 hours OR In accordance with the Risk-Informed Completion Time Program 12 hours OR In accordance with the Risk-Informed Completion Time Program
G. Two or more DGs inoperable.	G.1 Restore all but one DG to OPERABLE status.	2 hours
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F or G not met.	H.1 -------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------- Be in MODE 3.	 12 hours

(continued)

ACTIONS (continued)

I. One or more offsite circuits and two or more DGs inoperable. OR Two or more offsite circuits and one DG inoperable for reasons other than Condition B.	I.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	---------------------------NOTES--------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. 3. A single test at the specified Frequency will satisfy this Surveillance for both units. --- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3750 V and ≤ 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	In accordance with the Surveillance Frequency Control Program

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The following DC electrical power subsystems shall be OPERABLE:

a. Unit 2 Division I and Division II DC electrical power subsystems; and

b. Unit 1 Division I and Division II DC electrical power subsystems.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One DC electrical power subsystem inoperable.	A.1	--------------NOTE-------------- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition A results in de-energization of an AC electrical power distribution subsystem or a DC electrical power distribution subsystem. ------------------------------------ Restore DC electrical power subsystem to OPERABLE status.	7 days OR 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 I and Division II AC and DC electrical power distribution subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One AC electrical power distribution subsystem inoperable for planned maintenance due to either inoperable load group E1 bus(es) or inoperable load group E2 bus(es).	A.1 Restore affected load group bus(es) to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
B. One or more AC electrical power distribution subsystems inoperable for reasons other than Condition A.	B.1 Restore AC electrical power distribution subsystems to OPERABLE status.	8 hours <u>OR</u> In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more DC electrical power distribution subsystems inoperable due to loss of normal DC source.	C.1	Declare required feature(s), supported by the inoperable DC electrical power distribution subsystem, inoperable.	Immediately
	AND		
	C.2	Initiate action to transfer DC electrical power distribution subsystem to its alternate DC source.	Immediately
	AND		
	C.3	Declare required feature(s) supported by the inoperable DC electrical power distribution subsystem OPERABLE.	Upon completion of transfer of the required feature's DC electrical power distribution subsystem to its OPERABLE alternate DC source
	AND		
	C.4	Restore DC electrical power distribution subsystem to OPERABLE status.	7 days OR In accordance with the Risk-Informed Completion Time Program

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. One or more DC electrical power distribution subsystems inoperable for reasons other than Condition C.	D.1	Restore DC electrical power distribution subsystems to OPERABLE status.	7 days <u>OR</u> In accordance with the Risk-Informed Completion Time Program
E. Required Action and associated Completion Time of Condition A, B, 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
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1	Enter LCO 3.0.3.	Immediately

5.5 Programs and Manuals

5.5.14 Surveillance Frequency Control Program (continued)

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

5.5.15 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 MODE 1 and 2;

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.

(continued)

5.5.15 Risk-Informed Completion Time Program (continued)

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 function(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 used to support Amendment No. 336, 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 NOS. 308 AND 336

TO RENEWED FACILITY OPERATING LICENSE NOS. DPR-71 AND DPR-62

DUKE ENERGY PROGRESS, LLC

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-324 AND 50-325

1.0 INTRODUCTION

By application dated April 1, 2021 (Reference 1), as supplemented by letters dated April 26, 2021 (Reference 2), November 1, 2021 (Reference 3), and March 25, 2022 (Reference 4), Duke Energy Progress, LLC, (Duke Energy, the licensee) submitted a license amendment request (LAR) for Brunswick Steam Electric Plant, Units 1 and 2 (Brunswick).

The amendments 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 [CTs] – RITSTF Initiative 4b," dated July 2, 2018 (Reference 5). The U.S. Nuclear Regulatory Commission (NRC or the Commission) issued a final model safety evaluation (SE) approving TSTF-505, Revision 2, on November 21, 2018 (Reference 6).

The licensee has proposed variations from the TS changes approved in TSTF-505, Revision 2, which are described in Section 2.2.4 of this SE.

The NRC staff participated in a regulatory audit in September 2021, to ascertain the information needed to support its review of the application and develop requests for additional information, as needed. On September 22, 2021, the NRC staff issued an audit plan (Reference 7) that contained staff questions regarding the application. The licensee addressed the NRC staff's audit inquiries in the November 1, 2021, letter. On December 21, 2021, the NRC staff issued a summary of the regulatory audit (Reference 28).

The supplemental letters dated November 1, 2021, and March 25, 2022, 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 June 15, 2021 (86 FR 31738).

2.0 REGULATORY EVALUATION

2.1 Description of RISK-INFORMED COMPLETION TIME 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 can fail to be met. Specified with each stated Condition are Required Action (RAs) and CTs. The CTs are referred to as the "front stops" in the context of this SE. For certain Conditions, the TS require exiting the Mode of Applicability of an LCO (i.e., shutdown the reactor).

2.2 Description of TS Changes

The licensee's submittal requested approval to add a RICT program to the Administrative Controls section of the TS and modify selected CTs to permit extending the CTs, provided risk is assessed and managed as described in Nuclear Energy Institute (NEI) Topical Report (TR) 06-09-A, "Risk Informed Technical Specifications Initiative 4b: Risk Managed Technical Specifications (RMTS) Guidelines," Revision 0-A, October 2012 (NEI 06-09-A) (Reference 8). NEI 06-09-A provides a methodology for extending existing CTs and thereby delay exiting the operational mode of applicability or taking RAs if risk is assessed and managed within the limits and programmatic requirements established by a RICT program. NEI 06-09-A incorporated the NRC staff final model SE approving NEI 06-09 (Reference 10). The NRC staff issued Revision 2 to the final model SE approving NEI 06-09-A (Reference 6). The licensee's application proposed to use NEI 06-09-A and included documentation regarding the technical adequacy of the probabilistic risk assessment (PRA) models for the RICT Program, consistent with the guidance of Regulatory Guide (RG) 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk informed Activities," March 2009 (Reference 9).

2.2.1 TS 1.0 - Use and Application

Example 1.3-8, will be added to TS 1.3, “Completion Times,” and reads 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 5.	6 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.

2.2.2 TS 5.5.15 – Risk-Informed Completion Time Program

Technical Specification 5.5.15, "Risk-Informed Completion Time Program," will be added to the TS and reads as follows:

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 MODE 1 and 2;

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 function(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 used to support this license amendment, 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.

To note, for Unit 1, the Amendment No. is 308, and for Unit 2, the Amendment No. is 336.

2.2.3 Application of the RICT Program to Existing LCOs and Action Statements

A list of the TSs and associated LCO RAs for the CTs proposed to be modified are below.

- TS 3.1.7 - Standby Liquid Control (SLC) System
  Action A.1

- TS 3.3.1.1 - Reactor Protection System (RPS) Instrumentation
  Action A.1
  Action A.2
  Action B.1
  Action B.2

- TS 3.3.2.2 - Feedwater System and Main Turbine High Water Level Trip Instrumentation
  Action A.1

- TS 3.3.4.1 - Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation
  Action A.1
  Action A.2

- TS 3.3.6.1 - Primary Containment Isolation Instrumentation
  Action A.1

- TS 3.5.1 - ECCS [emergency core cooling systems] – Operating
  Action A.1
  Action D.2
  Action E.1
  Action E.2
  Action F.1
  Action G.1
  Action G.2

- TS 3.5.3 - RCIC [reactor core isolation cooling] System
  Action A.2

- TS 3.6.1.2 - Primary Containment Air Lock
  Action C.3

- TS 3.6.1.3 - Primary Containment Isolation Valves (PCIVs)
  Action A.1

- TS 3.6.1.5 - Reactor Building-to-Suppression Chamber Vacuum Breakers
  Action E.1

- TS 3.6.1.6 - Suppression Chamber-to-Drywell Vacuum Breakers
  Action A.1

- TS 3.6.2.3 - Residual Heat Removal (RHR) Suppression Pool Cooling
  Action A.1

- TS 3.7.1 - Residual Heat Removal Service Water (RHRSW) System
  Action A.1
  Action B.1

- TS 3.7.2 - Service Water (SW) and Ultimate Heat Sink (UHS)
  Action B.1

- TS 3.7.6 - The Main Turbine Bypass System
  Action A.1

- TS 3.8.1 - AC [alternating current] Sources – Operating
  Action C.3
  Action D.4
  Action E.2

Action F.1
Action F.2

- TS 3.8.4 - DC [direct current] Sources – Operating
  Action A.1

- TS 3.8.7 - Distribution Systems – Operating
  Action A.1
  Action B.1
  Action C.4
  Action D.1

Where necessary, conforming changes are made to CTs to make them accurate following use of a RICT. For example, the existing TS 3.6.1.3 above has requirements to close/isolate containment isolation devices if one or more containment penetrations have inoperable devices (Action A.2 and Action C.2). This is followed by a requirement to periodically verify the penetration is isolated. By adding the flexibility to use a RICT to determine a time to isolate the penetration, the periodic verifications must then be based on the time "following isolation."

2.2.4 Optional Changes and Variations from TSTF-505, Revision 2

2.2.4.1 Scope of LCOs included in RICT Program

The following Brunswick LCOs have been proposed to be included within the scope of the RICT program; however, they are not included in the generic list of LCOs approved by the NRC in TSTF-505.

- TS 3.5.1 - ECCS - Operating
  Action B.1
  Action B.2
  Action H.1
  Action H.2

- TS 3.7.2 - Service Water (SW) and Ultimate Heat Sink (UHS)
  Action A.1
  Action C.2
  Action E.1
  Action F.1
  Action F.2
  Action G.2.1
  Action G.2.2

2.2.4.2 Scope of TS REQUIRED ACTIONs Included in the RICT Program

The following Brunswick LCO RAs and CTs have been modified by the proposed change to permit the application of a RICT and are in addition to the TS LCOs included in TSTF-505.

- TS 3.3.5.1 - Emergency Core Cooling System (ECCS) Instrumentation
  Action B.3
  Note Not applicable when a loss of function occurs.
  Action C.2
  Note Not applicable when a loss of function occurs.
  Action D.2.1
  Note Not applicable when a loss of function occurs.
  Action E.2
  Note Not applicable when a loss of function occurs.
  Action F.2
  Note Not applicable when a loss of function occurs.

- TS 3.3.5.2 - Reactor Core Isolation Cooling (RCIC) System Instrumentation
  Action B.2
  Note Not applicable when a loss of function occurs.
  Action D.2.1
  Note Not applicable when loss of function occurs.

2.2.4.3 Scope of Changes to Support Adoption of TSTF-505, Revision 2

In order to support adoption of TSTF-505, Revision 2, LAR Attachment 1, Section 2.3, Item 5, stated:

> With the issuance of BSEP [Brunswick] license amendment numbers 264 and 292 (ADAMS Accession No. ML13329A362), the Completion Time for one inoperable emergency diesel generator (DG) (currently TS 3.8.1, Condition D, Required Action D.5) was extended from 7 to 14 days. However, with the proposed amendment to apply the RICT Program to the TS Action for one inoperable emergency DG, Duke Energy proposes to return to a front stop Completion Time of 7 days. Additionally, the supplemental alternating current (AC) power source (i.e., SUPP-DG) that was added to TS 3.8.1, Required Action D.2 by amendment numbers 264 and 292 as defense-in-depth [DID] for the Completion Time extension is no longer needed for a return to a 7 day front stop Completion Time. Therefore, TS 3.8.1, Required Action D.2 is proposed to be deleted. The TS and TS Bases mark-ups in Attachments 2 through 4 of the subject license amendment request reflect these proposed changes that are in addition to the proposed change in accordance with TSTF-505, Revision 2, which is to apply the RICT Program to the TS Action for one inoperable emergency DG.

2.3 Regulatory Requirements and Guidance

The regulation at 10 CFR Section 50.90, “Application for amendment of license, construction permit, or early site permit,” states whenever a holder of a license wishes to amend the license, including TSs in the license, an application for amendment must be filed, fully describing the changes desired.

The regulation at 10 CFR 50.36(c)(2) requires that TSs contain LCOs which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met. Typically, the TSs require restoration of equipment in a timeframe commensurate with its safety significance, along with other engineering considerations. The regulation at 10 CFR 50.36(b) requires that TSs be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto.

Appendix A, “General Design Criteria (GDC) for Nuclear Power Plants,” to 10 CFR Part 50 establishes the minimum requirements for the principal design criteria for water-cooled nuclear power plants. The following GDC is applicable for this review:

> GDC 17, “Electric power systems,” requires, in part, an onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.
>
> The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.
>
> Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained.
>
> Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the

> transmission network, or the loss of power from the onsite electric power supplies.

In determining whether the proposed TS remedial actions should be granted, the Commission will apply the "reasonable assurance" standards of 10 CFR 50.40(a) and 50.57(a)(3). The regulation at 10 CFR 50.40(a) states that in determining whether to grant the licensing request, the Commission will be guided by, among other things, consideration about whether "the processes to be performed, the operating procedures, the facility and equipment, the use of the facility, and other technical specifications, or the proposals, in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with the regulations in this chapter, including the regulations in 10 CFR Part 20 of this chapter, and that the health and safety of the public will not be endangered."

The regulation at 10 CFR 50.36(c)(5) states that administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

The regulation at 10 CFR 50.55a(h) "Protection and safety systems" states, in part, that for nuclear power plants with construction permits issued before January 1, 1971, protection systems must be consistent with their licensing basis or may meet the requirements of IEEE Std. 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995. The Brunswick construction permits were issued on February 7, 1970, so this requirement is applicable to Brunswick.

Section 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" (i.e., the Maintenance Rule), requires licensees to monitor the performance or condition of SSCs against licensee-established goals in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions. The regulation at 10 CFR 50.65(a)(4) requires the assessment and management of the increase in risk that may result from a proposed maintenance activity.

The regulation at 10 CFR 50.36(a)(1) states, in part: "[a] summary statement of the bases or reasons for such specifications other than those covering administrative controls shall also be included in the application but shall not become part of the technical specifications." Accordingly, along with the proposed TS changes, the licensee also submitted TS Bases changes that correspond to the proposed TS changes, to provide the reasons for those TSs.

10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactor," insofar as it requires that the ECCS be designed with sufficient margin to assure that the design safety limits specified in 10 CFR 50.46(b) are met during loss-of-coolant accidents (LOCAs).

<u>Commission Policy</u>

The NRC provided details concerning the use of PRA in the "Final Policy Statement: Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities," published in the *Federal Register* (60 FR 42622; August 16, 1995). In this publication, the Commission wrote, in part:

> The Commission believes that an overall policy on the use of PRA methods in nuclear regulatory activities should be established so

that the many potential applications of PRA can be implemented in a consistent and predictable manner that would promote regulatory stability and efficiency. In addition, the Commission believes that the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach….

PRA addresses a broad spectrum of initiating events by assessing the event frequency. Mitigating system reliability is then assessed, including the potential for multiple and common cause failures. The treatment therefore goes beyond the single failure requirements in the deterministic approach. The probabilistic approach to regulation is, therefore, considered an extension and enhancement of traditional regulation by considering risk in a more coherent and complete manner….

Therefore, the Commission believes that an overall policy on the use of PRA in nuclear regulatory activities should be established so that the many potential applications of PRA can be implemented in a consistent and predictable manner that promotes regulatory stability and efficiency. This policy statement sets forth the Commission's intention to encourage the use of PRA and to expand the scope of PRA applications in all nuclear regulatory matters to the extent supported by the state-of-the-art in terms of methods and data….

Therefore, the Commission adopts the following policy statement regarding the expanded NRC use of PRA:

(1) The use of PRA technology should be increased in all regulatory matters to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy.

(2) PRA and associated analyses (e.g., sensitivity studies, uncertainty analyses, and importance measures) should be used in regulatory matters, where practical within the bounds of the state-of-the-art, to reduce unnecessary conservatism associated with current regulatory requirements, regulatory guides, license commitments, and staff practices. Where appropriate, PRA should be used to support the proposal for additional regulatory requirements in accordance with 10 CFR 50.109 (Backfit Rule). Appropriate procedures for including PRA in the process for changing regulatory requirements should be developed and followed. It is, of course, understood that the intent of this policy is that existing rules and regulations shall be complied with unless these rules and regulations are revised.

> (3) PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.
>
> (4) The Commission's safety goals for nuclear power plants and subsidiary numerical objectives are to be used with appropriate consideration of uncertainties in making regulatory judgments on the need for proposing and backfitting new generic requirements on nuclear power plant licensees.

The NRC staff considered the following regulatory guidance during its review of the proposed changes:

- RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (Reference 9).
- RG 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 29).
- RG 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 11).
- RG 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications" (Reference 12).
- NUREG-1855, Revision 1, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking" (Reference 13).
- NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [light-water reactor] Edition," Chapter 19, Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance" (Reference 14) and Section 16.1, "Risk-Informed Decision Making: Technical Specifications" (Reference 15).

The LAR cited Revision 2 of RG 1.200, Revision 2 of RG 1.174, and Revision 1 of RG 1.177. These RGs have been updated since the issuance of those revisions. The updates do not include any technical changes that would impact the plants' consistency with NEI 06-09-A, therefore, the NRC staff finds Revision 2 of RG 1.200, Revision 2 of RG 1.174, and Revision 1 of RG 1.177, acceptable for the implementation of the RICT program.

2.3.1 NRC Endorsed Guidance

NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines" (Reference 8) provides guidance for risk-informed TS. The NRC staff issued a final model SE approving NEI 06-09 on May 17, 2007 (Reference 10). The NRC staff issued a final model SE approving TSTF-505, Revision 2, on November 21, 2018 (Reference 6).

3.0 TECHNICAL EVALUATION

3.1 Method of Staff Review

The NRC staff reviewed the licensee's PRA peer review history and results, alternative methods and proposed approaches to determine if they are technically acceptable for use in the proposed RICT extensions. The NRC staff also reviewed the licensee's proposed RICT program to determine if it provides the necessary administrative controls to permit completion time extensions consistent with NEI 06-09-A.

An acceptable approach for making risk-informed decisions about proposed TS changes, including both permanent and temporary changes, is to show that the proposed licensing basis (LB) 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 1. These key principles and tiers are:

Principle 1: The proposed LB change meets the current regulations unless it is explicitly related to a requested exemption.

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

Principle 3: The proposed LB change maintains sufficient safety margins.

Principle 4: When the proposed LB change results in an increase in risk, the increase 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 LB change should be monitored by using performance measurement strategies.

3.2 Review of Key Principles

Each of these key principles and tiers are addressed in NEI 06-09-A. NEI 06-09-A provides a methodology for extending existing CTs that may delay exiting the operational mode of applicability or taking RAs 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 is discussed below.

3.2.1 Key Principle 1: Evaluation of Compliance with Current Regulations

The NRC staff reviewed the licensee's proposed addition of the RICT program to the Administrative Controls Section of the TS. The NRC staff evaluated the elements of the new program to ensure alignment with the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36(c)(5) and to ensure the programmatic controls are consistent with the RICT program described in NEI 06-09-A.

The regulations in 10 CFR 50.36(c)(5) require the TS to contain administrative controls providing "provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner." The NRC staff has determined that the Administrative Controls Section of the TS will assure the licensee's RICT program will be implemented consistent with the elements prescribed in NEI 06-09-A. Therefore, the NRC staff has determined that the requirements of 10 CFR 50.36(c)(5) are satisfied.

Paragraph 50.36(c)(2) of 10 CFR requires TSs contain LCOs which 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 shall shut down the reactor or follow any remedial action permitted by the TS until the condition can be met.

The CTs in the current TSs were established using experiential data, risk insights, and engineering judgment. The RICT program provides the necessary administrative controls to permit extension of CTs and, thereby, delay reactor shutdown or RAs, if risk is assessed and managed appropriately within specified limits and programmatic requirements and the safety margins and DID remains 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 prescribed in NEI 06-09-A, and TS 5.5.15. The RICT is limited to a maximum of 30 days (termed the "back stop").

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 <u>*OR*</u> *In accordance with the Risk-Informed Completion Time Program*

In Attachment 1 of the LAR, the licensee provided a list of the TS, associated LCOs, and RAs for the CTs that included modifications and variations from TSTF-505, Revision 2. The modifications and variations consisted of proposed changes to the Required Actions and CTs. The NRC staff reviewed the proposed changes to the TS, associated LCOs, Required Actions and CTs provided by the licensee for the scope of the RICT program and concluded that with the incorporation of the RICT program, the required performance levels of equipment specified in LCOs are not changed, only the required CT for the Required Actions are modified, such that 10 CFR 50.36(c)(2) will remain met.

3.2.1.1 Key Principle 1 Conclusions

Based on the discussion provided above, the NRC staff finds that the TS example, RICT Program, and Required Actions described in Section 2.2 of this SE meet the first key principle of RG 1.174, Revision 3, and RG 1.177, Revision 1.

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 LB change is maintained for the DID 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.
- Maintain multiple fission product barriers.
- Preserve sufficient defense against human errors.
- Continue to meet the intent of the plant's design criteria.

The licensee proposed no changes to the design of the plant or any operating parameter, and no new 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 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). A configuration-specific RICT may not be used if the system has lost the capability to perform its safety function(s). These restrictions on inoperability of all required trains of a system ensure that consistency with the DID 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.

The RICT will be applied to extend CTs on key electrical power distribution systems. Failures in electrical power distribution systems can simultaneously affect multiple safety functions; therefore, potential degradation to DID during the extended CTs is discussed further below.

The licensee has requested to use the RICT program to extend the existing CTs for the respective TS LCOs listed in Section 2.2 of this SE. The NRC staff's evaluation of the proposed changes for these LCOs assessed the plant specific redundant or diverse means to mitigate accidents to ensure consistency with the plant LB requirements.

Enclosure 1, Section 6.0, "Evaluation of Instrumentation and Control [I&C] Systems and Maintaining Defense-in-Depth," of the LAR provided information supporting the evaluation of the redundancy, diversity, and DID of instrumentation included in the proposed TS changes. The I&C TSs with RICTs for certain RAs include:

- TS 3.3.1.1, Reactor Protection System (RPS) Instrumentation
- TS 3.3.2.2, Feedwater and Main Turbine High Water Level Trip Instrumentation
- TS 3.3.4.1, Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation
- TS 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation
- TS 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation
- TS 3.3.6.1, Primary Containment Isolation Instrumentation

The NRC staff evaluated LAR Enclosure 1 using the guidance prescribed in RG 1.174, RG 1.177, and TSTF-505, to ensure adequate DID (for each of the functions) to operate the facility in the proposed manner (i.e., that the changes are consistent with the DID criteria). The applicable DID criteria for the affected Brunswick I&C systems include: (1) overreliance on programmatic activities, as compensatory measures associated with the change in the licensing basis, is avoided; (2) system redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system (e.g., there are no risk outliers); (3) defenses against potential CCF are maintained and the potential for the introduction of new common cause failure mechanisms is assessed; and (4) the intent of the plant's design criteria is maintained.

3.2.2.1 Evaluation of Instrumentation and Control Systems

The NRC staff's evaluation of the proposed changes considered several potential plant conditions permitted by the proposed TS and considered what redundant or diverse means were available to assist the licensee in responding to various plant events. Specifically, Section 6, Tables E1-4 through E1-9 of LAR Enclosure 1 provided an explanation, for both units, of the redundant or diverse means to address each event for each I&C condition that can be risk-informed. In the April 26, 2021, LAR supplement, the licensee provided the Unit 1 and Unit 2 markup for TS 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," to show the proposed changes. The enclosure to this letter provided the appropriate TS 3.3.5.2 markup to reflect the proposed RICT program. In addition, in the November 1, 2021, LAR supplement, the licensee provided a revised Table E1-1 and supplemental Tables E1-1a, E1-1b, E1-1c, and E1-1d that superseded Table E1-1 in the April 1, 2021, LAR, and provided additional details for the design success criteria and proposed TS changes to add clarifying notes regarding loss of function.

As described in the LAR, for all applicable I&C-related TSs, the addition of a RICT is accompanied by a note that only allows the use of the RICT program when a loss of function has not occurred. Therefore, there is no loss of function while within one of these RICTs. Because there is not a loss of function, these amendments would preserve: (1) system independence; (2) diversity (note: no loss of function can only infer the proposed changes do not alter the original diversity scheme during the RICT; this original diversity may not be adequate during the extended RICT, and therefore, diversity is evaluated in each subsection below); (3) the balance among the layers of defense; and (4) the multiple fission product barriers. The amount of time that redundancy is allowed to be reduced is potentially increased by these amendments. The NRC staff evaluated the diversity described in Section 6 of the LAR and concluded that the consequences of failures in the presence of challenges is acceptable, and therefore, adequate system redundancy is preserved commensurate with the expected frequency and consequences of challenges to the system.

3.2.2.1.1 TS 3.3.1.1, Conditions A and B

TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," identifies several functions in TS Table 3.3.1.1-1. The LAR proposed the addition of risk-informed CTs to Conditions A and B. RA A.1 is applicable to all of the functions listed in Table 3.3.1.1-1, while RA A.2 is applicable to all functions except 2.a, 2.b, 2.c, 2.d, or 2.f.

Section 6.1 of LAR Enclosure 1 described the voting (or coincidence) logic associated with each RPS function and provides Table E1-4 that identifies the diverse RPS instrumentation for each transient/accident. This diverse instrumentation includes a manual scram.

Revised Table E1-1 and supplemental Table E1-1a provided design success criteria in terms of number of trip systems, total number of channels per trip system, and minimum channels needed for function success for both units' LCO 3.3.1.1, Conditions A and B.

In addition to the diverse means within the RPS, there are also diverse systems that also initiate a reactor trip, as described in Section 6.1 of LAR Enclosure 1:

> In addition, BSEP [Brunswick] has redundant and diverse methods of shutting down the reactor in the unlikely event that the RPS does not scram the reactor. The Alternate Rod Insertion (ARI) system provides backup capability to insert the control rods into the reactor and can be manually or automatically initiated. The reactor recirculation pumps have trips to reduce reactor power via negative void reactivity feedback via the ATWS-RPT subsystem. BSEP also has a Standby Liquid Control System (SLC) as an independent backup system. The system can be manually initiated via Main Control Room keylock switches to inject boron into the Reactor Vessel and to initiate closure of the Reactor Water Clean-Up (RWCU) outboard isolation valve to prevent removal of the injected boron.

Based on the automatic diverse means, both within the RPS and within the ATWS-related systems, the NRC staff determined there is adequate diversity and sufficient defense against human errors due to no overreliance on programmatic activities as compensatory measures for initiating a reactor trip.

3.2.2.1.2 TS 3.3.2.2, Condition A

LCO 3.3.2.2, "Feedwater and Main Turbine High Water Level Trip Instrumentation," requires that "[t]hree channels of feedwater and main turbine high water level trip instrumentation shall be OPERABLE."

Section 6.2 of LAR Enclosure 1 described the voting (or coincidence) logic associated with this instrumentation. Additionally, Table E1-5 identified the diverse instrumentation for each transient/accident. For each event, both automatic and manual diverse means exist.

Based on the automatic diverse means, the NRC staff determined there is adequate diversity and sufficient defense against human errors due to no overreliance on programmatic activities as compensatory measures for initiating a feedwater trip.

3.2.2.1.3 TS 3.3.4.1, Condition A

LCO 3.3.4.1, "Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation," requires that "[t]wo channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE: a. Reactor Vessel Water Level–Low Level 2; and b. Reactor Vessel Pressure–High."

Section 6.3 of LAR Enclosure 1 describes the voting (or coincidence) logic associated with this instrumentation. Additionally, Table E1-6 identified the diverse instrumentation for the transient/accident. For the event, both automatic and manual diverse means exist.

Revised Table E1-1 and supplemental Table E1-1b provided design success criteria in terms of number of trip systems, total number of channels per trip system, and minimum channels needed for initiation success for both units' LCO 3.3.4.1, Condition A.

This system has two automatic means (one is diverse) to address the event. Based on these automatic diverse means, the NRC staff determined there is adequate diversity and no overreliance on programmatic activities (e.g., manual means) as compensatory measures for initiating a recirculation pump trip. In addition, the NRC staff determined the two automatic and diverse means provide sufficient defense against human errors.

3.2.2.1.4 TS 3.3.5.1, Conditions B, C, D, E, and F

LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," requires the various ECCS instrumentation functions be OPERABLE. Conditions B, C, D, E, and F are each applicable to specific functions as stipulated in TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation."

Section 6.4 of LAR Enclosure 1 described the voting (or coincidence) logic associated with this instrumentation. Additionally, Table E1-7 identified the diverse instrumentation for each transient/accident. For each event, at least one diverse means exists (i.e., manual, and in some cases, automatic diverse means).

Revised Table E1-1 and supplemental Table E1-1c provided design success criteria in terms of number of trip systems, total number of channels per trip system, and minimum channels needed for function success; and revised the proposed TS to include a note that RICT program implementation is not applicable when a loss of function occurs.

The NRC staff finds that the ECCS design has sufficient redundancy, diversity, and DID to protect against common cause failures and potential single failure during implementation of the RICT program for the Brunswick I&C systems and does not rely on manual actions as the only diverse means; therefore, there is no over-reliance of programmatic activities as compensatory measures.

3.2.2.1.5 TS 3.3.5.2, Conditions B and D

LCO 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System Instrumentation," requires that the various RCIC instrumentation functions be OPERABLE. Conditions B and D are each applicable to a different function.

Section 6.5 of LAR Enclosure 1 described that the RCIC design creates DID because of the redundancy of the channels for the Initiation Function. The November 1, 2021, LAR supplement described that “HPCI [high pressure coolant injection] exceeds RCIC design criteria and fully performs all functions provided by RCIC.” Therefore, RCIC as a system by itself is not required to be redundant.

Section 6.5 described the voting (or coincidence) logic associated with this instrumentation. Additionally, Table E1-8 identified the diverse instrumentation for each transient/accident. For each event, only one diverse means exists (i.e., manual); however, as described in the previous paragraph, RCIC creates DID due to the initiation functions. The November 1, 2021, LAR supplement revised the proposed TSs to include a note that RICT program implementation is not applicable when a loss of function occurs.

The NRC staff finds that the RCIC design has sufficient redundancy, diversity, and DID to protect against common cause failures and potential single failure during implementation of the RICT program for the Brunswick I&C systems and does not rely on manual actions as the only diverse means; therefore, there is no over-reliance of programmatic activities as compensatory measures.

3.2.2.1.6 TS 3.3.6.1, Condition A

LCO 3.3.6.1, “Primary Containment Isolation Instrumentation,” requires that the various primary containment isolation instrumentation functions shall be OPERABLE. Condition A applies to all functions.

Section 6.6 of LAR Enclosure 1 also describes the voting (or coincidence) logic associated with this instrumentation and provides Table E1-9, which identifies the diverse instrumentation for each transient/accident. For most primary containment isolation instrumentation, multiple automatic diverse means are available. For one of the Reactor Water Cleanup (RWCU) system primary containment isolation instrumentation functions (manual initiation of the Standby Liquid Control (SLC) System), the licensee identified its diversity as solely manual actuation. Per Brunswick UFSAR Section 9.3.4, “[t]he objective of the Standby Liquid Control (SLC) System is to provide a backup method, independent of the control rods, which will establish and maintain the reactor subcritical as the nuclear system cools.” The NRC staff determined that the diverse means of the SLC system initiation includes the automatic and/or manual RPS instrumentation as defined in LCO 3.3.1.1.

Revised Table E1-1 and supplemental Table E1-1d provides design success criteria, in terms of number of trip systems, total number of channels per trip system, and minimum channels needed for function success for both units’ LCO 3.3.6.1, Condition A.

The NRC staff finds that the Primary Containment Isolation design has sufficient redundancy, diversity, and DID to protect against common cause failures and potential single failure during implementation of the RICT program for the Brunswick I&C systems and does not rely on manual actions as the only diverse means, except for manual initiation of the SLC system; therefore, there is no overreliance of programmatic activities as compensatory measures.

3.2.2.1.7 Instrumentation and Control Systems Conclusions

Since the licensee did not propose any changes to the design basis, the independency and the fail-safe principles remain unchanged. The licensee did not propose any changes that would represent a loss of function. However, the NRC staff recognized that while in an ACTION statement, redundancy of the given protective feature will be temporarily reduced, and, accordingly, the system reliability will be reduced. In the LAR, the licensee stated in the description of proposed changes to the I&C systems that at least one redundant or diverse means (e.g., other automatic features or manual action) to accomplish the safety functions (e.g., reactor trip, safety injection, or containment isolation) remain available during the use of the RICT program. The NRC staff reviewed the licensee's proposed TS changes to assess the availability of the redundant or diverse means to accomplish the safety function(s).

The NRC staff finds that the availability of the redundant or diverse protective features provide sufficient DID to accomplish the safety functions, allowing for the extension of CTs in accordance with the RICT program. The NRC staff finds that the licensee's proposed RICT program to the identified I&C systems complies with 10 CFR 50.36(b) and 10 CFR 50.55a(h).

The NRC staff reviewed the licensee's proposed TS changes and supporting documentation. The NRC staff finds that while the I&C system redundancy is reduced, the CT extensions implemented in accordance with the RICT program are acceptable because: (a) the capability of the I&C systems to perform their safety functions is maintained, (b) redundant or diverse means to accomplish the safety functions exist, and (c) the licensee will identify and implement RMAs to monitor and control risk in accordance with the RICT program.

3.2.2.2 Evaluation of ECCS

The ECCS is designed, in conjunction with the primary and secondary containment, to cool the core and limit the release of radioactive materials to the environment following a LOCA. The ECCS network at each Brunswick unit consists of the HPCI system, two Core Spray (CS) subsystems, four Low-Pressure Coolant Injection (LPCI) pumps, and Automatic Depressurization System (ADS) valves. TS 3.5.1 requires that each ECCS injection/spray subsystem and the function of six ADS valves be OPERABLE. If the requirements are not met, certain RAs, depending upon the specific conditions, are taken to restore the inoperable required subsystems or function to OPERABLE status within the required CT.

The licensee indicated that TS LCO 3.5.1, Conditions B and H, discussed below, are plant-specific Conditions not included within TSTF-505, Revision 2. The review below evaluates whether the licensee's proposed changes to TS LCO 3.5.1, Conditions B and H are acceptable for the RICT program. Specifically, whether the ECCS subsystems could provide adequate core cooling during a design-basis LOCA for TS LCO 3.5.1, Conditions B and H, respectively.

3.2.2.2.1 Methodologies Used for the LOCA Analyses

The analyses of record (AOR) of the LOCA events was discussed in Section 6.3.3 of the Brunswick Updated Final Safety Analysis Report (UFSAR) (Reference 16). The analyses were performed using EXEM BWR-2000 methodology for ATRIUM 10XM fuel and AURORA-B LOCA methodology for ATRIUM 11 fuel.

The EXEM BWR-2000 methodology, as discussed in Subsection 6.3.3.5.1.2 of the UFSAR, consists of three computer codes: (1) RELAX for analyzing the system and hot-channel thermal-hydraulic response during blowdown, refill, and reflood phases of the LOCA, (2) HUXY for performing the heat-up calculations for the entire postulated LOCA; and (3) RODEX2 for predicting fuel parameters used as input to blowdown and heat-up analysis for both the system and hot channel analyses. The AURORA-B LOCA methodology, as described in Subsection

6.3.3.5.1.3 of the UFSAR, is composed of three computer codes: (1) S-RELAP5 thermal-hydraulic system code, (2) a kinetic version of the MICROBURN-B2 core code, and (3) the RODEX4 fuel thermal-mechanical code.

Both LOCA methodologies above were previously approved by the NRC and documented in NRC-approved Topical Reports (TRs) (References 30 and 31).

3.2.2.2.2 AOR for LOCA Events

The AOR for the LOCA events, as discussed in Subsection 6.3.3.5.2 of the UFSAR, addresses breaks located in non-ECCS piping systems (including recirculation suction, main steam, and main feedwater piping), as well as breaks in the ECCS piping system, such as CS piping, with various break sizes. As shown in Table 6-15 of Chapter 6 of the UFSAR, the analyses include the effects of the following credible single failures: (1) a direct current (DC) battery source, (2) a diesel generator (DG), (3) a LPCI injection valve, and (4) the HPCI system. Further in Table 6-15 for each analyzed LOCA case with the assumed single failure, the licensee identified the remaining operable ECCS subsystems. Subsection 6.3.3.5.3.2 of the UFSAR indicated that for the ATRIUM 10XM fuel, the most limiting LOCA was a 3.6 ft^2 split of the recirculation discharge piping, along with a failure of the LPCI injection valve resulting in two CS subsystems and ADS available. For the ATRIUM 11 fuel, the most limiting case was the double-ended guillotine break of recirculation suction line, along with a failure of battery power resulting in one CS subsystem, three LPCI pumps, and ADS available. The licensee demonstrated (see the table in Section 6.3.3.5.3.2 of the UFSAR Chapter 6) that the results of the LOCA analyses conformed with the ECCS acceptance criteria of 10 CFR 50.46.

3.2.2.2.3 TS 3.5.1, Condition B

TS 3.5.1, Condition B, applies to one LPCI pump and one CS subsystem inoperable. RA B.1 and B.2 allow 72 hours to restore the inoperable LPCI pump or the CS subsystem to an OPERABLE status. The ECCS for each unit consists of two CS subsystems, a HPCI system, four LPCI pumps, and ADS valves. As indicated in Table 6-19 of the UFSAR, there are seven relief valves with ADS functions. TS LCO 3.5.1 requires the function of six ADS valves to be OPERABLE. For Condition B with one CS subsystem and one LPCI pump inoperable, the remaining OPERABLE ECCS subsystems consist of one CS subsystem, the HPCI system, three LPCI pumps, and six ADS valves.

In addressing whether TS 3.5.1, Condition B, with the remaining OPERABLE ECCS subsystems, could provide adequate core cooling during a design-basis LOCA, the licensee indicated in Section 2.3, Item 6 of the LAR that the ECCS subsystems assumed in an analysis of a LOCA with the single failure of one DG (listed in Table 6-15 of the UFSAR, consisting of one CS subsystem, the HPCI system, three LPCI pumps, and ADS valves), would be sufficient to maintain core cooling and meet the ECCS performance acceptance criteria specified in 10 CFR 50.46(b). Table 6-19 indicated that five of six required operable ADS valves were credited for the LOCA analysis.

Since the ECCS remaining capability in TS 3.5.1, Condition B, exceeds the ECCS subsystems credited in the Brunswick UFSAR LOCA analysis, the NRC staff concluded that TS LCO 3.5.1, Condition B, would be adequately supported by the AOR and would not involve a loss of ECCS function, and therefore, is acceptable for RICT program application.

3.2.2.2.4 TS 3.5.1, Condition H

TS 3.5.1, Condition H, applies to one required ADS valve and the HPCI system inoperable. RAs H.1 and H.2 allow 72 hours to restore the inoperable required ADS valve or the HPCI system to OPERABLE status. Table 6-19 of the UFSAR indicated that there are seven relief valves with the ADS functions. TS LCO 3.5.1 requires the function of six ADS valves be OPERABLE. For Condition H with one required ADS valve and the HPCI subsystem inoperable, the remaining OPERABLE ECCS subsystems consist of two CS subsystems, four LPCI pumps, and five ADS valves.

In addressing whether TS 3.5.1, Condition H, with the remaining OPERABLE ECCS subsystems, could provide adequate core cooling during a design-basis LOCA, the licensee indicated in Section 2.3, Item 6 of the LAR that TS 3.5.1, Condition H is equivalent to the ECCS subsystems assumed in the analysis of another applicable case of a LOCA event: a recirculation suction line break with the single failure of the HPCI system listed in Table 6-15 of the UFSAR. The analysis of the applicable LOCA case shows that the ECCS subsystems, including two CS subsystems, four LPCI pumps, and ADS valves, would be adequate to reflood the reactor vessel, maintain core cooling, and meet the design safety limits specified in 10 CFR 50.46(b). Table 6-19 of the UFSAR indicated that five of six required operable ADS valves were credited for the LOCA analysis.

Since the ECCS capability retained by TS LCO 3.5.1, Condition H, is equivalent to the ECCS subsystems assumed in the Brunswick UFSAR analysis of an applicable LOCA case, the NRC staff concluded that TS LCO 3.5.1, Condition H, is adequately supported by the AOR and does not involve a loss of ECCS function. Therefore, TS LCO 3.5.1, Condition H, is acceptable for RICT program application in accordance with the guidance of NEI 06-09-A.

3.2.2.2.5 ECCS Conclusions

The NRC staff reviewed the proposed TS LCO 3.5.1, Conditions B and H, and determined that they would not lead to a loss of the core cooling function of the ECCS and are acceptable for RICT program application since: (1) the current LOCA analyses in the UFSAR satisfied 10 CFR 50.46 requirements and was previously approved by the NRC, (2) the proposed TS LCO 3.5.1, Conditions B and H, exceeded or are equivalent to the ECCS subsystems assumed in the LOCA AOR, (3) the proposed TS Conditions satisfy 10 CFR 50.36(c)(2)(ii), Criterion 3, and (4) the proposed TS Conditions meet the NEI 06-09-A applicability guidance for maintaining its specified safety function of ECCS.

3.2.2.3 Evaluation of Primary Containment Airlock

3.2.2.3.1 TS 3.6.1.2, Condition C

As indicated in revised Table E1-1, the primary containment air locks are not explicitly modeled in the Brunswick PRA. Since the containment airlocks are not modeled, there are no explicit PRA success criteria. However, a large pre-existing leak failure will be used by the licensee as a conservative surrogate for the RICT calculation.

Prior to RICT program implementation for TS 3.6.1.2, RA C.3, the function will be maintained due to completion of RA C.1 (requires the condition to be assessed in accordance with LCO 3.6.1.1, “Primary Containment” (i.e., “Initiate action to evaluate primary containment overall leakage rate per LCO 3.6.1.1…” with a CT of Immediately)) and TS 3.6.1.2, RA C.2 (verifying a door is closed). Therefore, the LCO meets the listed requirements for inclusion in the RICT program.

3.2.2.3.2 Primary Containment Airlock Conclusions

The staff evaluated the information provided for TS 3.6.1.2, Condition C, which applies when an air lock is inoperable for reasons other than an inoperable door or an inoperable interlock mechanism, and the potential for containment leakage beyond allowable limits must be assessed to ensure no loss of containment function is associated with the air lock inoperability. The licensee stated in its LAR that, "[o]ne double door primary containment air lock has been built into the primary containment to provide personnel access to the drywell and to provide primary containment isolation during the process of personnel entering and exiting the drywell. As part of the primary containment pressure boundary, the air lock's safety function is related to control of containment leakage rates following a DBA [design-basis accident]." The proposed change to the associated RA C.3 permits consideration of the RICT only when action to evaluate overall containment leakage rate per TS 3.6.1.1 has been immediately initiated and one air lock door is closed. These conditions provide reasonable assurance that any loss of function condition would be detected and preclude usage of the RICT. Therefore, there is no loss of function condition associated with the condition when a RICT is permitted, and the proposed change is acceptable.

3.2.2.4 Evaluation of Service Water System and Ultimate Heat Sink (UHS)

3.2.2.4.1 TS 3.7.2, Conditions A, C, E, F, and G

As indicated in revised Table E1-1, the conventional service water (CSW) and nuclear service water (NSW) pumps are explicitly modeled in the Brunswick PRA. The licensee stated in Section 2.3, Item 6 of the LAR that:

> The SW System consists, in part, of four site NSW pumps (two Unit 1 pumps and two Unit 2 pumps), three unit-specific CSW pumps and two independent headers; the NSW header and the CSW header. The NSW pumps can supply only the NSW header. However, each CSW pump can be manually aligned to the CSW header or the NSW header, which provides additional operating flexibility. The SW System is considered OPERABLE when it has two OPERABLE CSW pumps, three site NSW pumps (any combination of Unit 1 and Unit 2 NSW pumps), and an OPERABLE flow path capable of taking suction from the intake structure and transferring the water to the ECCS equipment and the [DGs].
>
> Condition A applies to one required inoperable NSW [nuclear service water] pump due to an inoperable opposite unit NSW header. In this condition, the opposite unit is also in MODE 4 or 5. Required Action A.1 allows 14 days to restore the required NSW pump to OPERABLE status. With a unit in this condition, sufficient cooling water can still be provided to the DGs.
>
> Condition C applies to one required inoperable CSW [conventional service water] pump. Required Action C.2 allows 7 days to restore the required CSW pump to OPERABLE status. With a unit in this condition, the OPERABLE CSW pump and NSW pumps are adequate to perform the heat removal function.

> Condition E applies to two required CSW pumps inoperable. Required Action E.1 allows 72 hours to restore one of the required CSW pumps to OPERABLE status. With a unit in this condition, the OPERABLE NSW pumps are adequate to perform the heat removal function.
>
> Condition F applies to one required CSW pump inoperable concurrent with one required NSW pump. Required Actions F.1 and F.2 allow 72 hours to restore one of the inoperable pumps. With a unit in this condition, the OPERABLE SW pumps (both CSW and NSW pumps) are adequate to perform the heat removal function.
>
> Condition G applies to two required CSW pumps inoperable concurrent with [] one NSW pump. Required Actions G.2.1 and G.2.2 allow 72 hours to restore one of the required CSW pumps to OPERABLE status or the required NSW pump to OPERABLE status if both applicable unit NSW pumps are verified OPERABLE per Required Action G.1. With two required CSW pumps inoperable concurrent with one required NSW pump and both applicable unit NSW pumps verified OPERABLE, adequate heat removal capability is ensured by the OPERABILITY of the remaining SW pumps.

For TS 3.7.2, Conditions A, C, E, F, and G, the licensee has determined that in these Conditions the remaining operable service water subsystems provide at least 100% of the heat removal needs to maintain the design function.

3.2.2.4.2 Service Water System and UHS Conclusions

The PRA success criteria is three SW pumps functioning to provide normal, transient and accident cooling water for SW system loads. Successful throttling of the turbine building closed cooling water (TBCCW) heat exchanger reduces the required number of CSW pumps in the PRA. SSCs are modeled consistently with the TS scope and so they can be directly evaluated by the CRMP. The success criteria in the PRA are consistent with the design basis criteria.

The staff evaluated the information provided for these plant-specific LCOs and associated RAs to confirm that the Conditions do not represent a TS loss of function.

Revised Table E1-1 stated, in part, that:

> The success criteria in the PRA are consistent with the design basis criteria. However, the Service Water PRA success criteria credits the following alignments. During normal operation one NSW and two CSW pumps are functioning to provide SWS [SW system] loads. Following the transient, the pump configuration remains the same, so loads normally supplied from the NSW header still require a single NSW pump. Given a running NSW pump, then one CSW pump can be sufficient for the CSW header during shutdown if the TBCCW heat exchanger throttle valve functions to reduce flow through the TBCCW heat exchanger. Successful throttling of the TBCCW heat exchanger reduces the required number of CSW pumps to one (for CSW header supply). If the nuclear header is to be supplied from CSW because the NSW supply is failed, then an additional CSW pump is required, so either all three CSW pumps must function, or two of three with successful throttling of TBCCW flow. This logic applies to loads supplied by the NSW header. In order for the diesel generator [DG] to be

> supplied from CSW, one additional CSW pump must be available to provide the required flow for both the EDGs [DGs] and the RHR system, so the success criteria is two CSW pumps with successful throttling. The success criterion also addresses the potential for using pumps from the opposite unit to supply the diesel generators [DGs].

Because there is no loss of function condition associated with TS 3.7.2, Conditions A, C, E, F, and G, application of the RICT program is appropriate.

3.2.2.5 Evaluation of Main Turbine Bypass System

3.2.2.5.1 TS 3.7.6, Condition A

As indicated in revised Table E1-1, the turbine bypass valves (TBVs) are explicitly modeled in the Brunswick PRA. For Unit 1, the PRA success criterion is that all four Unit 1 TBVs must open to support condenser cooling. However, for the same amount of steam flow for Unit 2 as Unit 1, only 3 out of 10 Unit 2 TBVs must open. SSCs are modeled consistent with the TS scope and can be directly evaluated by an application-specific PRA modelling tool (i.e., configuration risk management program (CRMP)).

For Unit 1, the success criteria in the PRA are more restrictive than the design basis criteria. In the PRA, a failure of any one of the four TBVs fails the system. For Unit 2, to ensure the PRA success criteria sufficiently bounds the design basis success criteria, the basic event chosen to represent the Unit 2 configuration is the common cause failure basic event for all TBVs. Therefore, the LCO meets the listed requirements for inclusion in the RICT program due to the PRA success criteria bounding the design basis success criteria.

3.2.2.5.2 Main Turbine Bypass System Conclusions

The staff evaluated the information provided for TS 3.7.6, Condition A, which applies when requirements of the LCO are not met. The licensee has determined that for Unit 1, all four TBVs are required for the system's PRA function not to fail, which is more restrictive that the design basis criteria. For Unit 2, the design basis success criteria are 8 out of 10 TBVs required, while the PRA success criterion is that 3 out of 10 TBVs must open to support the PRA function. In its November 1, 2021, LAR supplement, the licensee stated that:

> Thus, to account for the difference, the Unit 2 LCO is mapped to a [CCF] basic event that fails all ten [TBVs], which fails the system, when any of the Unit 2 turbine bypass components are removed from service for the RICT program. This ensures that the PRA surrogate bounds the design-basis success criteria. …In the PRA, the Turbine Bypass system is credited for condenser cooling through the [TBVs] after a reactor trip occurs. The steam flow capacity available to be cooled through the [TBVs] by the condenser that is credited in the PRA is the same between both units. The PRA is not concerned with the load rejection capability of the turbine bypass system prior to a reactor trip.
>
> For Unit 2, by using the CCF of all the TBVs as a surrogate, this fails the entire system in the risk model. This is a conservative approach in assuming that TBVs are failed, when in actuality some of the valves may still be able to accomplish the safety function.

Therefore, since the PRA success criteria bounds the design basis success criteria, and there is no loss of function condition associated with the Condition, application of the RICT program is appropriate.

3.2.2.6 Evaluation of Electrical Power Systems

According to Sections 8.2.1, 8.3.1, and 8.3.2 of the Brunswick UFSAR, the electrical power systems consisting of both AC and DC is designed to perform their safety functions assuming a single failure. The single failure criterion is preserved by specifying that all redundant components of safety related systems are required to be operable when a plant enters an LCO (i.e., in an ACTION statement). The evaluations below consider the Brunswick plant configurations from a DID perspective.

Section 8.2.1.3 of the UFSAR indicated that the 230 kilovolts (kV) switchyard has two sections with each dedicated to a specific Brunswick unit. Each switchyard section has two buses connected to a unit's main power transformer (MPT), startup auxiliary transformer (SAT), and four transmission lines using double breakers for each connection. Each MPT can connect to either bus of its unit's switchyard section allowing continuity of power to the grid for a single bus fault. UFSAR Section 8.2.1.1, "Generators and Buses" indicated that the main generator (MG) for each unit can be isolated from its MPT and unit auxiliary transformer (UAT), as necessary, using its installed manual no-load disconnect switch.

Sections 8.3.1 and 8.3.1.4 of the UFSAR indicated that each unit's auxiliary loads are normally supplied from its MG through its UAT to two main balance of plant (BOP) buses (1C and 1D for Unit 1 and 2C and 2D for Unit 2). Each of those BOP buses can be supplied by two offsite circuits upon loss of its MG either by its SAT or, if the SAT fails by back feed mode, through its MPT and UAT. Each main BOP bus feeds a 4.16 kV engineered safety features (ESF) bus (E1 or E2 for Unit 1 or E3 or E4 for Unit 2) through a single feeder and dual breakers (master and slave breakers). Buses E1 and E3 are assigned to Division I in both units and buses E2 and E4 are similarly assigned to Division II, and a division can be referred to as a load group or AC electrical power subsystem. Each ESF bus can also be directly connected to its dedicated DG. Each 4.16 kV ESF bus can support the shutdown of its respective unit. Three 4.16 kV ESF buses are required per design basis to shut down the station (both units) for worst-case accidents covered in the licensing basis (see USFAR Tables 8-9 thru 8-16). The 4.16 kV buses have cross connected loads that further increases the plant's capability in addressing DBAs. The two tie breakers, each between two 4.16 kV ESF buses (used during Station Blackout (SBO) or 10 CFR Part 50 Appendix R fire event) are either racked out, or procedurally controlled via local operation, to prevent paralleling of incoming power sources. The Supplemental Diesel Generator (SUPP-DG) can be connected to any one of the four 4.16 kV ESF buses through its 4.16 kV BOP bus circuit path for an SBO event in one unit, with the capacity to bring the affected unit to cold shutdown.

Each 4.16 kV ESF bus supplies one ESF 480 Volts AC (VAC) bus (E1 to E5, E2 to E6, E3 to E7, and E4 to E8) which supplies ESF 480 VAC motor control center(s) (MCCs). The two ESF 480 VAC buses in each unit can be connected by their two tie breakers controlled either automatically from main control room or manually at the buses if required interlocks are met. 480 VAC ESF buses E6 and E8 can each have a FLEX DG connected to it for beyond-design-basis external events to respond to extended loss of all AC power in both units.

Section 8.3.1.4 of the UFSAR indicated that ESF loads are separated into two redundant divisions in each unit with no means of automatically connecting them together (except tie breakers for 4.16 kV and 480 VAC ESF buses previously discussed above with one of affected buses being a dead bus). Separation and independence are maintained between those divisions in both units including their raceways.

Section 8.3.1.1.7.2.1 of the UFSAR indicated that the "120/208 VAC Uninterruptible Power Supply (UPS) and Distribution System consists of [UPS] buses (one for each unit). Each bus receives its power from one of two 100 percent capacity [UPS] units or a 100 percent capacity hard line (reserve bus) with high speed static switching between them. On the loss of one [UPS,] the total bus load will be assumed by the 100 percent hard line (reserve bus). On loss of normal auxiliary power to the regulated power supply, the inverter will be fed directly from the related battery."

Section 8.3.2.1 of the UFSAR indicated that the 125/250 Volts DC (VDC) system for each unit consists of two divisions (subsystems) per unit (Division I and Division II). Each division consists of a center-tapped 250 VDC battery derived from two 125 VDC batteries (1A-1 and 1A-2 for Division I and 1B-1 and 1B-2 for Division II in Unit 1) electrically connected in series with the four Unit 2 125 VDC batteries similarly labeled. A division also has a battery charger for each 125 VDC battery, a switchboard (1A and 1B for Unit 1 and 2A and 2B for Unit 2) that supplies both 125 and 250 VDC loads, and 125 VDC distribution panels powered by the switchboard. Each battery charger is powered by the same AC division to which its battery supplies control power. A 125 VDC battery supplies its assigned 125 VDC when its battery charger is unavailable. Division II battery chargers for each unit are supplied power from normal and alternate sources to meet 10 CFR Part 50, Appendix R requirements. If a 125 VDC battery and its charger are unavailable, its switchboard's 250 VDC and the affected battery's 125 VDC loads will be inoperable. 125 VDC loads include, for example, 4160/480 VAC ESF bus control power, and DG start and run controls normally powered by a DC distribution panel(s) of the same division. Additionally, a manual transfer is possible to a same division DC distribution panel for the other unit.

The licensee requested to use the RICT program to extend the completion times for ACTION Statements in TS 3.8, "Electrical Power Systems." The NRC staff's evaluation of the proposed changes considered potential plant conditions for the proposed RICTs and the availability of AC and DC power sources available for mitigating the consequences of an accident and loss of offsite power (LOOP).

The NRC staff reviewed the TS RAs in the LAR, the UFSAR, and applicable TS LCOs to verify that the capability of the affected electrical power systems to perform their safety functions (assuming no additional failures) would be maintained. To achieve that objective, the staff verified whether each proposed TS RA design success criteria (DSC) stated in revised Table E1-1 reflected the minimum electrical power sources/subsystems required to be operable by the LCOs to support the safety functions necessary to mitigate postulated DBAs, safely shutdown the reactor, and maintain it in that safe shutdown condition. The NRC staff further reviewed the remaining credited power sources/equipment to verify whether each proposed condition satisfies its design success criteria. In conjunction with reviewing the remaining credited power sources/equipment, the NRC staff considered supplemental electrical power sources/equipment (not necessarily required by the LCOs and can be either safety or non-safety related) that are available at Brunswick and capable of performing the same function(s) of the inoperable electrical power source/equipment. In addition, the NRC staff reviewed the proposed risk management action (RMA) examples for reasonable assurance that these RMAs were appropriate to monitor and control risk for applicable TS conditions. The staff's evaluation of these matters is provided below.

The staff noted that the LAR references the TSs of both units which have some differences but are essentially the same.

3.2.2.6.1 TS 3.8.1 Conditions C, D, E, and F

In the LAR, the licensee proposed the option to use the RICT program to extend the existing 72-hour CT for TS 3.8.1, RA C.3, to restore the required one offsite circuit to operable status. The example calculation in Table E1-2 of the LAR indicated a RICT of 30 days. The safety function covered by the corresponding TS LCO is the General Design Criteria (GDC) 17-related offsite power requirement for safe shutdown of the plant.

The NRC staff analyzed the safe shutdown capability of each unit for this proposed TS change. According to revised Table E1-1, the DSC for TS 3.8.1, Condition C, states "[e]ither offsite supply is adequate for each bus. Three emergency buses are adequate for all events." Each unit has two offsite circuits that are specific to that unit and independent of the other unit's two offsite circuits. TS 3.8.1, Condition C, is for online maintenance of a Unit 1 or 2 offsite circuit (e.g., its SAT in RICT), since it is for other than TS 3.8.1, Conditions A or B, with both units entering LCOs and with the other unit's offsite circuits available. For Condition C, the worst-case would be a Unit 2 SAT in RICT and not recoverable when a LOCA occurs on Unit 1. The reliability of the offsite system is reduced with increased potential for a complete LOOP for either unit or both units. However, the remaining operable offsite circuit for Unit 2 and the two available offsite circuits for Unit 1 permit all four 4.16 kV ESF buses to be operational, with only three required, enabling the safe shut down of both the accident and non-accident units. The DSC for this LCO is met because it only requires three 4.16 kV ESF buses while for this specific worst-case scenario all four 4.16 kV ESF buses are operational. As a DID measure, the DGs for both units are available and would start but not load to their buses for the LOCA and are capable to support safe shutdown of both units. Therefore, the proposed change does not impact compliance with GDC 17 because offsite power for safe shutdown of each unit is available.

Based on the above discussion, the NRC staff finds that during RICT program entry for the proposed TS 3.8.1, RA C.3, the DID of the electrical power systems that ensures AC power to key safety-related equipment required to operate during DBAs is reduced to at least the required minimum electrical power sources for the LCO. Based on the availability of the remaining electrical AC power sources to support the safety functions, compliance with GDC 17 is not impacted and the specific DSC is met. Therefore, the NRC staff finds the proposed change to TS 3.8.1, Condition C, is acceptable.

For TS 3.8.1, Condition D, as stated in the November 1, 2021, LAR supplement, Brunswick license amendments 264 and 292 extended the front stop CT to 14 days provided the SUPP-DG is available. However, this LAR deletes TS 3.8.1, RA D.2, that verified availability of SUPP-DG and restores the original licensing basis CT of 7 days for RA D.4. Additionally, the licensee proposed the option to use the RICT program for proposed RA D.4 to restore the inoperable DG to operable status for TS 3.8.1, Condition D. The example calculation in Table E1-2 of LAR Enclosure 1 indicated a RICT of 30 days. The safety function covered by the corresponding TS LCO is the GDC 17-related onsite power requirement for safe shutdown of the plant.

The NRC staff analyzed the safe shutdown capability of each unit during RICT program entry with the assumption that a station LOOP occurs concurrently with a LOCA in Unit 1, which is the licensing basis of Brunswick, as described in the UFSAR. According to revised Table E1-1, the

DSC for TS 3.8.1, Condition D, is "[A DG] is adequate for each bus. Three emergency buses are adequate for all events." For one inoperable DG from either unit, both units enter the LCO. Tables 8-9 through 8-16 of the UFSAR provide a listing of loads supplied by the remaining three operable DGs for the loss of each DG taken one at a time for a station LOOP and LOCA in each unit. That analysis indicated that three 4.16 kV ESF buses are initially required to address a LOCA for the first 10 minutes in the accident unit. From 10+ minutes to greater than 24 hours from LOCA initiation, the accident unit only requires two 4.16 kV ESF buses, whereas the non-accident unit requires one 4.16 kV ESF bus for each unit's safe shutdown.

For any DG in a RICT, the station has adequate capacity to support the controlled shutdown of both units by utilizing the remaining three DGs, if per the above scenario, offsite power is not available. During this scenario, Brunswick takes advantage of cross connected ECCS loads on 4.16 kV ESF buses (e.g., each bus has two residual heat removal (RHR) pumps – one for Unit 1 and other for Unit 2). Therefore, the staff determined that when one DG is in a RICT, the plant is in conformance with its licensing basis and the intent of GDC 17 for the minimum number of required AC power sources, even though redundancy is reduced. The proposed change meets its specific DSC of one DG being adequate for each bus.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.1, Condition D, the DID of the electrical power systems that ensures onsite AC power to safety-related equipment required to operate during DBAs with or without offsite power is reduced to at least the required minimum AC electrical power source. Therefore, the staff determined that based on the availability of the remaining onsite AC power sources and their electrical distribution equipment to support safety functions, and with GDC 17 remaining satisfied and the specific DSC met, the proposed change to TS 3.8.1, Condition D, is acceptable for the RICT program. In addition, the staff finds the deletion of verifying functionality of SUPP-DG for TS 3.8.1, RA D.2, and restoration of the original front stop CT of 7 days acceptable because the change restores the plant's original licensing basis.

The licensee proposed the option to use the RICT program to extend the existing 24-hour CT for the proposed TS 3.8.1, RA E.2, to restore all but one offsite circuit to operable status. The example calculation in Table E1-2 of LAR Enclosure 1 indicated a RICT of 30 days. The safety function covered by the corresponding TS LCO is the GDC 17-related onsite power requirement for safe shutdown of the plant. The staff found that the example RMAs in LAR Enclosure 12 are consistent with the intent of NEI 06-09-A, Section 3.4.3, for risk awareness and control during the unplanned failure scenarios, and representative of the RMAs the licensee would employ for TS 3.8.1, Condition E.

The NRC staff analyzed the safe shutdown capability of each unit during RICT program entry for TS 3.8.1, Condition E, for two or more offsite circuits inoperable for reasons other than TS 3.8.1, Condition B. According to revised Table E1-1, the DSC for TS 3.8.1, Condition E, is "[e]ither offsite supply is adequate for each bus. Three emergency buses are adequate for all events." This TS is for online maintenance of two or more offsite circuits in either unit with each unit having two offsite circuits independent from the other unit. Either unit or both units could potentially lose two offsite circuits due to being in a RICT with both units being in an LCO. If a LOCA occurred in one unit with both units without offsite power, both units would be shutdown using the available four DGs with only three required. If there was no LOCA or accident requiring shutdown, both units could remain online in accordance with the RICT and this LCO.

Based on the above discussion, the NRC staff finds that during a RICT program entry for the proposed TS 3.8.1, RA E.2, the DID of the electrical power systems that ensures AC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum electrical power sources. Therefore, the staff determined that based on the availability of the remaining AC power sources to support the safety functions, and with GDC 17 remaining satisfied and the specific DSC met, the proposed change to TS 3.8.1, Condition E, is acceptable for implementation of the RICT program.

The licensee proposed the option to use the RICT program to extend the existing 12-hour CTs for the proposed TS 3.8.1, RAs F.1 and F.2, to restore the inoperable offsite power source or DG to operable status for TS 3.8.1, Condition F. The example calculation in Table E1-2 of LAR Enclosure 1 indicated a RICT of 30 days. The safety function covered by the TS LCO is the GDC 17-related power requirement for safe shutdown of the plant.

The staff evaluated TS 3.8.1, Condition F, with both units entering the LCO. Revised Table E1-1 for TS 3.8.1, Condition F, DSC states: "[e]ither offsite supply or one [DG] is adequate for each bus. Three emergency buses are adequate for all events." One unit would have one offsite power source inoperable and one DG inoperable for reasons other than TS 3.8.1, Condition B, with that unit having one remaining offsite circuit and DG. The other unit would have its full complement of offsite circuits and DGs. Therefore, the available offsite circuits and the DGs are adequate for safe shutdown of the affected unit in the LCO or both units as necessary.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.1, RAs F.1 and F.2, the DID of the electrical power systems that ensures AC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum electrical power sources. Therefore, the staff determined that based on the availability of the remaining AC power sources to support the safety functions, with GDC 17 remaining satisfied and the specific DSC met, the proposed change to TS 3.8.1, Condition F, is acceptable for implementation of the RICT program.

3.2.2.6.2 TS 3.8.4, Condition A

The licensee proposed the option to use the RICT program to extend the existing 7-day CT for TS 3.8.4, RA A.1, to restore a DC electrical power subsystem (division) to operable status for TS 3.8.4, Condition A. The example calculation in Table E1-2 of LAR Enclosure 1 indicated that use of the RICT program for this LCO is allowed only for unplanned equipment failures for DC components that would precipitate a loss of a DC electrical power subsystem that is not precluded by the instantaneous core damage frequency (CDF), or large early release frequency (LERF) limits of 1E-03 or 1E-04, respectively, for the plant condition. In accordance with NEI 06-09-A, an unplanned configuration "includes an unintentional, emergent situation (i.e., discovery of failure or significant degradation of an SSC with the provision to utilize a RICT or a forced, unscheduled extension of previously-planned maintenance)" in comparison with planned online maintenance. The safety function covered by this TS LCO is the GDC 17-related power requirement for safe shutdown of the plant.

The NRC staff analyzed the safe shutdown capability of each unit during a RICT program entry for TS 3.8.4, Condition A, for one DC electrical power subsystem inoperable. According to revised Table E1-1, the DSC for TS 3.8.4, Condition A, is "[t]hree trains of DC power are adequate." For the online maintenance of one DC electrical power subsystem (train or division) in either Unit 1 or 2, the availability of the other three DC electrical online subsystems (one from one unit and two from the other unit), as required by the DSC for this TS, would be sufficient to validate safe shutdown capability for the plant. However, per NEI 06-09-A, RICT program entry is not warranted except for unplanned failures and the licensee would have to estimate the RICT and perform required maintenance.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.4, RA A.1, the DID of the electrical power systems that ensures DC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum DC electrical power sources. Therefore, the staff determined that based on the availability of the remaining DC power sources to support the safety functions, with GDC 17 remaining satisfied and the specific DSC is met, the proposed change to TS 3.8.4, Condition A, is acceptable for implementation of the RICT program only for unplanned failures as proposed by licensee.

3.2.2.6.3 TS 3.8.7, Conditions A, B, and C

The licensee proposed the option to use the RICT program to extend the existing 7-day CT for TS 3.8.7, RA A.1, to restore an AC electrical power distribution subsystem (load group) to operable status for TS 3.8.7, Condition A. The example calculation in Table E1-2 of LAR Enclosure 1 indicated a RICT of 15.4 days. The safety function covered by the TS LCO is the GDC 17-related power requirement for safe shutdown of the unit or the plant. According to revised Table E1-1, the DSC for TS 3.8.7, Condition A, is “[t]hree of four load groups are adequate.”

The staff evaluated TS 3.8.7, Condition A, for one AC electrical power distribution subsystem (division or load group) inoperable for the unit that is not operating (Mode 4 or 5) with both units entering the LCO. For maintenance of the AC electrical power system for the unit that is shutdown, there is sufficient shutdown capability and the remaining three AC electrical power distribution subsystems (two from the operating unit and one from the shutdown unit) to shut down the operating unit and to maintain both units in a safe condition even if a LOCA occurs in the operating unit simultaneously with a station LOOP. That is based on one of the load groups in the shutdown unit being energized and functional.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.7, RA A.1, the DID of the remaining AC electrical distribution power subsystems ensures AC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum electrical power sources. Therefore, the staff determined that based on the availability of the remaining electrical AC power distribution subsystems to support the safety functions, and with GDC 17 remaining satisfied and the specific DSC is met, the proposed change to TS 3.8.7, Condition A, is acceptable for implementation of the RICT program.

The licensee proposed the option to use the RICT program to extend the existing 8-hour CT for TS 3.8.7, RA B.1, to restore one or more AC electrical power distribution subsystems to operable status for TS 3.8.7, Condition B. The example calculation in Table E1-2 of LAR Enclosure 1 indicated that use of the RICT program for this LCO is allowed only for unplanned equipment failures for DC components that would precipitate a loss of a DC electrical power subsystem that is not precluded by the instantaneous CDF, or LERF limits of 1E-03 or 1E-04, respectively. The safety function covered by this TS LCO is the GDC 17-related power requirement for safe shutdown of a unit. According to revised Table E1-1, the DSC for TS 3.8.7, Condition B, credits “[t]hree of four load groups are adequate.”

The staff evaluated the loss of one or more AC electrical power distribution subsystems for reasons other than planned maintenance during a RICT program entry for TS 3.8.7, Condition B, and the consequences on station operation. Condition B is for the loss of one or more AC electrical power subsystems for reasons other than TS 3.8.7, Condition A. The staff noted that if one unit was shut down and the operating unit had an AC electrical power subsystem in a RICT, then the shutdown unit must have its two AC electrical power subsystems energized and functional, especially if the operating unit had a LOCA occur. Further, if two or more AC electrical power distribution subsystems were in a RICT at same time, there is not sufficient safe shutdown capability since the DSC would not be met. Per NEI 06-09-A, if the DSC is not met, entry into the RICT program is not warranted except for unplanned failures.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.7, RA B.1, with only one AC electrical power subsystem inoperable for reasons other than planned maintenance, the DID of the AC electrical power systems that ensures AC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum AC electrical power sources. Based on the availability of the remaining electrical AC power sources to support the safety functions for unavailability of one AC electrical power subsystem, GDC 17 continues to be satisfied, the specific DSC would be met, and the NRC staff finds the proposed change to TS 3.8.7, Condition B is acceptable for RICT program implementation only for unplanned failures in which only one AC electrical power subsystem is inoperable. The implementation of the RICT program for a plant condition with two or more AC electrical power subsystems inoperable is not acceptable due to the lack of sufficient safe shutdown capability of the AC electrical power system.

The licensee proposed the option to use the RICT program to extend the existing 7 day CT for TS 3.8.7, RA C.4, to restore one or more DC electrical power distribution subsystems to OPERABLE status for TS 3.8.7, Condition C. The example calculation in Table E1-2 of LAR Enclosure 1 indicated that use of the RICT program for this LCO is allowed only for unplanned equipment failures for DC components that would precipitate a loss of a DC electrical power subsystem that is not precluded by the instantaneous CDF, or LERF limits of 1E-03 or 1E-04, respectively. According to revised Table E1-1, the DSC for TS 3.8.7, Condition C, credits "[t]hree or four DC distribution systems are adequate."

The staff evaluated the loss of one or more DC electrical power distribution subsystems during RICT program entry for TS 3.8.7, Condition C, and the consequences on station operation. Condition C is for the loss of one or more DC electrical power distribution subsystems due to the loss of the normal DC source. The staff noted that if one unit was shut down and the operating unit had a DC electrical power distribution subsystem in a RICT, then the shutdown unit must have its two DC electrical power distribution subsystems energized and functional, especially if the operating unit had a LOCA occur. Further, if two or more DC electrical power distribution subsystems were in a RICT at same time, there is not sufficient safe shutdown capability since the DSC for this TS would not be met. Per NEI 06-09-A, if the DSC is not met, entry into the RICT program is not warranted except for unplanned failures.

Based on the above discussion, the NRC staff finds that during a RICT program entry for TS 3.8.7, RA C.4, with only one DC electrical power subsystem inoperable for reasons other than planned maintenance, the DID of the DC electrical power systems that ensures DC power to safety-related equipment required to operate during DBAs is reduced to at least the required minimum DC electrical power sources. Based on the availability of the remaining electrical DC power sources to support the safety functions for unavailability of one DC electrical power subsystem, GDC 17 continues to be satisfied, the specific DSC would be met, and the NRC staff finds the proposed change to TS 3.8.7, Condition C, is acceptable for RICT program implementation only for unplanned failures in which only one DC electrical power subsystem is inoperable. The implementation of the RICT program for a plant condition with two or more DC electrical power subsystems inoperable is not acceptable due to the lack of sufficient safe shutdown capability of the DC electrical power subsystem.

3.2.2.6.4 Electrical Power Systems Conclusions

The NRC staff evaluated the proposed changes to Brunswick's electrical power systems that would add or change CTs evaluated in accordance with the RICT program for certain RAs of the proposed TS. The NRC staff finds that while redundancy may not be maintained, the CT extensions in accordance with the RICT program are acceptable because (a) the capability of the systems to perform their safety functions (assuming no additional failures) is maintained, and (b) the licensee's demonstration of identifying and implementing compensatory measures or RMAs, in accordance with the RICT program, are appropriate to monitor and control risk, and they are consistent with the intent of NEI 06-09-A, Section 3.4.3, for risk awareness and control during the unplanned failure scenarios.

3.2.2.7 Key Principle 2 Conclusions

The NRC staff has reviewed the licensee's proposed TS changes and supporting documentation. The NRC staff finds that extending the selected CTs with the RICT program following loss of redundancy, but maintaining the capability of the system to perform its safety function, is an acceptable reduction in DID during the proposed RICT period provided that the licensee identifies and implements compensatory measures in accordance with the RICT program during the extended CT.

The licensee confirmed in the LAR that the proposed changes do not alter the Brunswick system designs. Consequently, the NRC staff concludes that the proposed changes do not alter the ways in which the Brunswick systems fail, do not introduce new CCF modes, and the system independence is maintained. The NRC staff finds that some proposed changes reduce the level of redundancy of the affected systems, and this reduction may reduce the level of defense against some CCFs; however, such reductions in redundancy and defense against CCFs are acceptable due to existing diverse means available to maintain adequate DID against a potential single failure during a RICT.

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

3.2.3 Key Principle 3: Evaluation of Safety Margins

Section 2.2.2 of RG 1.177, Revision 1, states, in part, that sufficient safety margins are maintained when:

- Codes and standards … or alternatives approved for use by the NRC are met.
- Safety analysis acceptance criteria in the final safety analysis report (FSAR) 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, the licensee proposed to add a new program, "Risk-Informed Completion Time Program," in Section 5.0, "Administrative Controls," of the TSs, which would require 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 inoperable longer than the current TS allow, any increase is expected to be insignificant 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, if sufficient trains remain operable to fulfill the TS safety function, the operability of the remaining train(s) ensures that the current safety margins are maintained. The NRC staff finds that if the specified TS safety function remains operable, 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.

3.2.3.1 Key Principle 3 Conclusions

Based on the above, the NRC staff finds that the design-basis analyses for Brunswick remain applicable and unchanged. The NRC staff concludes that the proposed changes meet the third key principle of RG 1.177 and are acceptable.

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

TS 5.5.15, "Risk-Informed Completion Time Program," states that the RICT "must be implemented in accordance with NEI 06-09-A, Revision 0, "Risk-Managed Technical Specifications (RMTS) Guidelines."

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 approach described in Chapter 16.1 of the SRP, RG 1.177, Revision 1, and RG 1.174, Revision 3. This approach addresses the calculated change in risk as measured by the change in CDF and 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 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. In addition, the NRC staff evaluated the licensee's proposed changes against the three tiered approach in RG 1.177, Revision 1, 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

The first tier 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.

3.2.4.1.1 PRA Scope

RG 1.174 states that the scope, level of detail, and technical adequacy of the PRA are to be commensurate with the application for which it is intended and the role the PRA results play in the integrated decision process. The NRC's SER for NEI 06-09-A states that the PRA models should conform to the guidance in RG 1.200, Revision 1, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," January 2017 (ADAMS Accession No. ML070240001). The licensee indicated that the guidance in RG 1.200, Revision 2 (Reference 9), was used to support the current LAR. Revision 2 of RG 1.200 clarifies the current applicable American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA Standard is ASME/ANS RA-Sa-2009, "Addenda to ASME RA-S-2008, Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (Reference 18). For external hazards where a PRA has not been performed, the guidance in NEI 06-09-A allows the use of bounding analysis of the risk contribution of the hazard for incorporation into the RICT calculation or justification for why the hazard is not significant to the RICT calculation.

The NRC staff evaluated the PRA acceptability information provided by the licensee in Enclosure 2 of the LAR, including industry peer review results and the licensee's self-assessment of the PRA models for internal events, including internal flooding, and fire, against the guidance in RG 1.200, Revision 2. As described below, the licensee screened out all external hazard events except for seismic as insignificant contributors to RICT calculations, and that the Brunswick PRA model with modifications is used as the CRMP model. In addition, the licensee provided a bounding estimate of the seismic CDF and LERF and included those CDF and LERF values in the change in risk used to calculate RICTs consistent with the guidance in NEI 06-09-A.

3.2.4.1.2 Evaluation of PRA Acceptability for Internal Events and Internal Fires (Includes Internal Flooding)

Internal Events PRA

In Enclosure 2, Section 4.1.1 of the LAR, the licensee confirmed that the Brunswick internal events (includes flooding) PRA (IEPRA) model received a full-scope peer review in April 2010 using NEI 05-04 (Reference 17), the ASME PRA Standard ASME RA-Sa-2009 (Reference 18), and RG 1.200, Revision 2 (Reference 9). The licensee further stated that the internal flooding model received a focused-scope peer review in December 2016. Subsequent independent assessments to close facts and observations (F&Os) were performed in August 2017, December 2019, and May 2020 for the IEPRA (including internal floods) using Appendix X to NEI 05-04/07-12/12-16 (Reference 19), as accepted, with conditions by the NRC staff. The licensee stated no IEPRA F&Os remained open after the F&O closure reviews.

The NRC staff finds that the Brunswick IEPRA (including internal floods) was appropriately peer reviewed consistent with RG 1.200, Revision 2 and that the F&Os were closed consistent with

Appendix X guidance, as accepted, with conditions by the NRC staff. Therefore, the NRC staff concludes that the IEPRA (including internal floods) is acceptable for use in the RICT Program.

Internal Fire PRA

In Enclosure 2, Section 4.1.2 of the LAR, the licensee confirmed that the Brunswick internal fire events PRA (FPRA) model received a full-scope peer review in December 2011 using NEI 07-12, the ASME PRA Standard ASME/ANS RA-Sa-2009, and RG 1.200, Revision 2. The licensee further stated that a focused-scope peer review was conducted in May 2015. Further, independent assessments were performed in July 2017 and August 2018 consistent with Appendix X to NEI 05-04, 07-12, and 12-13, as accepted, with conditions by the NRC staff. As a result of the F&O closure reviews, no FPRA F&Os remained open.

The NRC staff finds that the Brunswick fire PRA was appropriately peer reviewed consistent with RG 1.200, Revision 2 and that the F&Os were closed consistent with Appendix X guidance, as accepted, with conditions by the NRC staff. Therefore, the NRC staff concludes that the fire PRA is acceptable for use in the RICT Program.

3.2.4.1.3 Evaluation of PRA External Hazards Modeled

The NRC staff's SE for NEI 06-09 (Reference 10), states that sources of risk besides internal events and internal fires (i.e., seismic and other external events) must be quantitatively assessed if they contribute significantly to configuration specific risk. The SE further states that bounding analyses or other conservative quantitative evaluations are permitted where realistic PRA models are unavailable. In addition, the SE concludes that if sources of risk can be shown to be insignificant contributors to configuration risk, then they may be excluded from the RMTS.

The licensee provided its assessment of external hazard risk for the RICT program in Enclosure 4 of the LAR, "Information Supporting Justification of Excluding Sources of Risk Not Addressed by the PRA Models." The licensee stated that the hazards assessed in Table E4-7 of Enclosure 4 to the LAR are those identified for consideration in non-mandatory Appendix 6-A of the ASME/ANS PRA standard which provides a guide for identification of most of the possible external events for a plant site. The NRC staff notes that the list of hazards in the LAR is essentially the same list of hazards as presented in Table 4-1 of NUREG-1855, Revision 1 (Reference 13).

The NRC staff finds that the list of external hazards considered by the licensee is consistent with the hazards listed in Appendix 6-A of the ASME/ANS RA-Sa-2009 PRA Standard, which is endorsed in RG 1.200, Revision 2.

In Section 5 of Enclosure 4 to the LAR, the licensee states for the overall process, consistent with NUREG-1855, Revision 1, that external hazards may be addressed by: (1) screening the hazard on low frequency of occurrence, (2) bounding the potential impact and including it in the decision making, and (3) developing a PRA model to be used in the RMAT/RICT calculation.

In Table E4-7 of Enclosure 4 to the LAR, the licensee provided a screening disposition for other external hazards and identifies that no unique PRA model for these hazards is required to assess configuration risk for the RICT program (with the exception of internal flooding and internal fire, which are addressed by a PRA).

The NRC staff notes that the progressive screening criteria used and presented in Table E4-8 of Enclosure 4 to the LAR are the same criteria presented in the supporting requirements EXT B-1 and EXT C-1 of the ASME/ANS PRA Standard.

External Hazards Scope

The licensee addressed the risk from seismic events and other external hazards in the context of this application in Enclosure 4 to the LAR. This enclosure provides the licensee's conservative estimate for the CDF and LERF from seismic events for use in determining the configuration risk for the RICTs identified in the LAR as discussed below. The basis for exclusion of certain hazards from consideration in determining RICTs due to their insignificance to configuration risk was also provided in the same enclosure as discussed below. The licensee stated in Section 6.1.2 of LAR Enclosure 4 that "… the design changes to [the] plant since issuance of the IPEEE [Individual Plant Examination of External Events] have not invalidated the Seismic Margins Analysis and that the risk insights obtained from the IPEEE are still valid under the current plant configuration."

The NRC staff reviewed Enclosure 4 to the LAR and supplemental information to determine the acceptability of the consideration of risk from seismic events and other external hazards for this application.

Seismic

The licensee explained in the November 1, 2021, LAR supplement, in its response to APLC Audit Question 01, that RICT calculations will include the risk contribution from seismic events using a "seismic penalty" approach. The licensee's approach for including the seismic risk contribution in the RICT calculation is to add a constant seismic CDF and seismic LERF to each RICT calculation. Section 3.3.5 of NEI 06-09-A states that for stations without external events PRAs, the station should apply one of three acceptable methods to determine external event risk. The second method identified in NEI 06-09-A, is a reasonable bounding analysis which must be case-specific and technically verifiable and must be shown to be conservative from the perspective of RICT determination.

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 21) and a plant-level high confidence of low probability of failure (HCLPF) capacity of 0.30g referenced to the site's peak ground acceleration (PGA). The licensee stated in the November 1, 2021, LAR supplement, that, "HCLPF is the capacity representing 95 percent confidence that the conditional probability of failure of an SSC is 5 percent or less." The uncertainty parameter for seismic capacity was represented by a combined beta factor of 0.4. The HCLPF parameters used for the Brunswick seismic CDF estimate are those cited for Brunswick in Table C.1 of NRC Generic Issue 199 (GI-199) (Reference 22). The 0.30g PGA value is consistent with the Brunswick IPEEE review level earthquake. Estimation of the seismic CDF is performed by convolving the PGA-based seismic hazard curve for the Brunswick site using ten seismic hazard intervals with the Brunswick PGA-based HCLPF. The calculated bounding seismic CDF is 3.02E-06 per year, which is proposed to be added to each RICT calculation. The NRC staff finds that the method to determine the baseline seismic CDF is acceptable because it is consistent with the approach used in GI-199. The NRC staff used the input parameters identified by the licensee to confirm the proposed bounding seismic CDF estimate.

Concerning the proposed bounding seismic LERF estimate, the licensee states in the November 1, 2021, LAR supplement, in response to APLC Audit Question 01, that the bounding seismic LERF estimate of 1.32E-06 per year is based on the convolution of the estimated seismic CDF (i.e., 3.02E-06 per year) with the limiting fragility of containment integrity. The licensee explained that an estimate of the seismic LERF is obtained by convolving the plant seismic hazard curve with the plant limiting fragility for core damage (i.e., 0.3g PGA HCLPF) to estimate the seismic CDF (as described above) and a limiting fragility for containment integrity also assumed to be 0.3g PGA HCLPF. Using this approach, the licensee calculated a seismic LERF of 1.32E-06 per year. The NRC staff finds that the licensee's approach to determining a seismic LERF estimate to be acceptable because use of a 0.3g PGA HCLPF as the limiting fragility for containment integrity is conservative as containments tend to have higher fragility values.

The NRC staff finds that, during RICTs for 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.

In summary, the NRC staff finds the licensee's proposal to use the seismic CDF contributions of 3.02E-06 per year, and a seismic LERF contribution of 1.32E-06 per year to be acceptable for the licensee's RICT program for Brunswick because: (1) the licensee used the most current site-specific seismic hazard information for Brunswick, (2) the licensee used an acceptably low plant HCLPF value of 0.3g and a combined beta factor of 0.4 consistent with the information for Brunswick in the GI-199 evaluation, (3) the licensee determined a seismic LERF penalty based on its estimate of seismic CDF combined with a containment integrity fragility of 0.3g PGA HCLPF, and (4) adding baseline seismic risk to RICT calculations, which assumes the fully correlated failures, is conservative for SSCs credited in seismic events while any potential non-conservative results for SSCs that are not credited in seismic events is small or nonexistent.

<u>High Winds and Tornado Hazards</u>

Section 6.2 of Enclosure 4 to the LAR discusses the licensee's evaluation of the high winds and tornadoes impact on this application. The basis for the insignificant impact of extreme winds and tornadoes (including tornado-generated missiles) for this application relies on the design of SSCs and a tornado missile analysis. Table E4-7 of the same enclosure presents the licensee's screening criteria used to disposition the risk for the high wind, tornado, hurricane, and tornado missile impact hazards. Table E4-8 indicated that criteria "C2" (Event has lower mean frequency and no worse consequences that other events analyzed), and "PS2" (Design basis for the event meets the criteria in the NRC 1975 Standard Review Plan (SRP)) are used to screen the high wind and tornado hazard. The LAR states that the Brunswick peer reviewed high wind PRA model results provided in Table E4-6 demonstrates the risk for this hazard is well below the thresholds for this application.

The NRC staff's review finds that the licensee has appropriately considered the risk from high winds and tornadoes in the proposed RICTs, that the high winds and tornado hazard has an insignificant contribution to configuration risk, and that it can be excluded from the calculation of the proposed RICTs.

External Flooding

Section 6.3 of Enclosure 4 to the LAR discusses the licensee's evaluation of the risk from external flooding hazard. The licensee's conclusions that the impact on this application is insignificant are based on the results documented in the licensee's flood hazard reevaluation report for Brunswick (Reference 23). Table E4-7 of the same enclosure presents the licensee's screening criteria used to disposition the risk for the external flooding hazard, as "C1" (Event damage potential is < that of events for which plant is designed), "C5" (Event develops slowly, allowing adequate time to eliminate or mitigate the threat), and "PS1" (Design basis hazard cannot cause a core damage accident).

Section 6.3.4 of LAR Enclosure 4 states, in part, that "LIP [local intense precipitation] has been screened from further consideration in the BSEP [Brunswick] PRA and from use in any BSEP risk informed applications. No impacts to risk significant SSCs from water intrusion is postulated from the LIP event and there are no challenges to any safety related functions with two doors in their normally closed position."

The NRC staff's review finds that the licensee has appropriately considered the risk from external flooding in the proposed RICTs, that the external flooding hazard has an insignificant contribution to configuration risk, and that it can be excluded from the calculation of the proposed RICTs. The NRC staff's review also noted that plant procedures exist to ensure that the flood protection features will be available during RICTs to manage the external flooding risk in the RICT Program.

Other External Hazards

Besides the seismic, external flooding, and high winds and tornadoes discussed above, the licensee provided rationale for screening out other external hazards for the Brunswick site in Table E4-7 of Enclosure 4 to the LAR. The NRC staff's review of the information in the submittal and supplements finds that contributions from other external hazards 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.

3.2.4.1.4 PRA Results and Insights

The proposed change implements a process to determine TS RICTs rather than specific changes to individual TS CTs. NEI 06-09-A delineates that periodic assessment be performed of the risk incurred due to operation beyond the "front stop" CTs resulting from implementation of the RICT program and comparison to the guidance of RG 1.174, Revision 3, for small increases in risk. In LAR Enclosure 5, the licensee provided the total baseline CDF and LERF to demonstrate that it meets the 1.0E-04/year CDF and 1.0E-05/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 TS 5.5.15. The total baseline CDF and LERF for Brunswick PRAs meet the RG 1.174, Revision 3 guidelines, and, therefore, the NRC staff concludes the PRA results and insights to be used by the licensee in the RICT program will be consistent with NEI 06-09-A.

3.2.4.1.5 Key Assumptions and Uncertainty Analyses

The licensee considered PRA modeling uncertainties and their potential impact on the RICT program. In LAR Enclosure 9, the licensee discussed the identification of key assumptions and sources of uncertainty and provided the dispositions for impact on the risk informed application. The licensee evaluated the Brunswick PRA model to identify the key assumptions and sources of uncertainty for this application consistent with the RG 1.200, Revision 2, definitions, using sensitivity and importance analyses to place bounds on uncertain processes, to identify alternate modeling strategies, and to provide information to users of the PRA.

The NRC staff evaluated the licensee's dispositions of the key PRA assumptions and sources of modeling uncertainty provided in LAR Enclosure 9, including those related to modeling the SUPP-DG and crediting FLEX in the PRA. The following discussion presents the NRC staff findings of this evaluation.

The licensee identified, as a source of uncertainty, the failure rates for the non-safety SUPP-DG and provided results of a sensitivity study on RICT estimates. The licensee stated that, due to the lack of plant specific failure data for the SUPP-DG, it used the generic industry data for EDGs, even though the SUPP-DG is not an EDG. In its November 1, 2021, LAR supplement, the licensee stated that they intend to update the SUPP-DG failure rate with Bayesian-updated SBO DG data to account for the site-specific failure rate prior to implementing the RICT program. Consistent with the guidance in NEI 06-09-A, the licensee can either provide RMAs when a key assumption impacts the calculated RICTs, or alternatively, update its PRA model to eliminate the key assumption. Therefore, the NRC staff finds the licensee's proposed plan to address this uncertainty acceptable because the licensee intends to update its PRA model to eliminate key assumptions.

Section 4.4 of LAR Enclosure 9 also discusses how FLEX strategies were credited in the current PRA model to support implementation of a RICT program at Brunswick. It provides a brief overview of the FLEX equipment modeled in the licensee's PRA (i.e., permanently installed FLEX DGs, portable FLEX pumps and portable FLEX air compressors), how this equipment is used to implement FLEX strategies, and sensitivity study results that quantify the impact of FLEX strategy implementation on station risk and an example RICT calculation. Sensitivity studies were performed to assess impact on the RICT duration assuming that FLEX failure rates are increased by an order of magnitude; and separately, increasing the FLEX Human Failure Events (HFEs) failure rates by a factor of three. In both cases, the licensee showed the estimated change in calculated RICT is negligible (approximately 0.3%). In its November 1, 2021, LAR supplement, the licensee outlined the specific FLEX operator actions modeled in the current PRA models and quantified the equipment failure data used in the current PRA models. The licensee indicated that a combination of generic industry data and plant specific data is currently used to support modeling of FLEX equipment failures in the PRA models. The licensee explained that the equipment failure reliability data will transition to newer data via the PRA model update process, as described in the ASME/ANS PRA Standard RA-Sa-2009, endorsed by RG 1.200, Revision 2. Because the licensee performed and justified sensitivity studies on FLEX equipment failure and human error probabilities, consistent with the guidance in NEI 06-09-A, and showed minor impact on the RICTs, the NRC staff finds the licensee's credit for FLEX acceptable for use for the RICT program for Brunswick. Consistent with the PRA model update process in the ASME/ANS PRA Standard RA-Sa-2009, endorsed by RG 1.200, and consistent with the guidance in NEI 06-09-A, the licensee should maintain its PRA models to reflect the as-built and as-operated plant and update data as it becomes available.

The NRC staff finds that the licensee performed an adequate assessment to identify the potential sources of uncertainty, and the identification of the key assumptions and sources of uncertainty was appropriate and consistent with the guidance in NUREG-1855, Revision 1, and associated Electric Power Research Institute (EPRI) TR-1016737 and EPRI TR-1026511, (References 24 and 25, respectively). Therefore, the NRC staff finds the licensee has satisfied the guidance in RG 1.177, Revision 1, and RG 1.174, Revision 3, and that the identification of assumptions and treatment of model uncertainties for risk evaluation of extended CTs is appropriate for this application and is consistent with the guidance in NEI 06-09-A.

Based on the NRC staff's review of the licensee's dispositions provided in Enclosure 9 of the LAR to the identified key assumptions and sources of modeling uncertainty, and the supplemental responses provided by the licensee, the staff finds the licensee's treatment of the identified key assumptions and key sources of uncertainty for this application is consistent with NUREG-1855, Revision 1, and NEI 06-09-A.

3.2.4.1.6 PRA Scope and Acceptability Conclusions

The licensee has subjected the PRA models to the peer review process and submitted the results of the peer review. The NRC staff reviewed the peer review history which included the results and findings, the licensee's resolutions of peer review findings, and the identification and disposition of key assumptions and sources of uncertainty. The NRC staff concludes that: (1) the licensee's PRA models are acceptable to support the RICT program, and (2) the key assumptions for the PRAs have been identified consistent with the guidance in RG 1.200, Revision 2, and NUREG-1855, Revision 1. Additionally, the licensee's approach for considering the impact of seismic events, non-seismic external hazards, and other hazards using alternative methods is acceptable.

Based on the conclusions discussed above, the NRC staff finds that the licensee has satisfied the intent of Tier 1 in RG 1.177, Revision 1 and RG 1.174, Revision 3, for demonstrating PRA acceptability, and that the scope of the PRA models (i.e., IEPRA, FPRA, and the use of a bounding analysis for seismic events) is appropriate for this application.

3.2.4.1.7 PRA Modeling

3.2.4.1.7.1 System and Surrogate Modeling

Section 3.2.2 of NEI 06-09-A specifies that to evaluate a RICT for a given RA, the specific systems or components involved should be directly modeled in the PRA or, if not directly modeled, the functions directly correlated to the specific systems or components are modeled in the PRA. Also, TSTF-505, Revision 2, states RAs for systems that do not affect CDF or LERF, or for which a RICT cannot be quantitatively determined, are not in scope of the program.

Revised Table E1-1 stated, in part: (1) identifies each TS LCO condition in scope of the RICT program and the SSCs covered by the LCO, as applicable; (2) indicated whether these SSCs are modeled in the PRA; and (3) for the cases where the SSCs are not explicitly modeled in the PRA, an explanation is provided on how the PRA uses surrogate events that bound the functions of the TS LCO SSCs.

The NRC staff reviewed the licensee proposed surrogates. In the supplement dated November 1, 2021, the licensee provided additional details and clarification regarding the proposed surrogates on certain TS LCOs in scope of the RICT program as described below.

In revised Table E1-1, the licensee proposed to use a conservative surrogate as the common cause failure of the RPS electrical system for TS 3.3.1.1. In response to APLA Question 1.c regarding TS LCO 3.3.5.1, Conditions E and F, concerning the ADS trip system, the licensee explained that the PRA model only models the manual depressurization function and that is the depressurization function that will be failed in the PRA model to capture the RICT for this LCO. In response to APLA Question 1.e regarding LCO 3.3.6.1, Condition A, the licensee explained that the proposed surrogate fails the entire containment isolation signal function when entering a RICT for this LCO. Similarly, in response to APLA Question 2.a regarding for TS LCO 3.6.1.2, Condition C, and APLA Question 2.b regarding those unmodeled containment isolation valves for TS LCO 3.6.1.3, Condition A, the licensee proposed a conservative surrogate that fails containment isolation when entering a RICT for these LCOs. In response to APLA Question 2.c regarding TS LCO 3.6.1.6, Condition A, the licensee explained that the proposed surrogate is vacuum breaker failure which results in the failure of the vapor suppression function. Additionally, in response to APLA Question 1.d the licensee explained that for TS LCO 3.3.5.2, Condition B, contrary to the LAR statements, that, upon further examination, the SSCs are explicitly modeled in the PRA. The NRC staff concludes the licensee’s proposed surrogates are acceptable because their use leads to conservative RICT calculations.

3.2.4.1.8 Success Criteria

The NRC SE to NEI 06-09-A specifies that the LAR is to provide a comparison of the TS functions to the PRA-modeled functions and that sufficient justification is to be provided to show that the scope of the PRA model, including applicable success criteria, is consistent with the licensing basis assumptions. Revised Table E1-1, and the response to APLA Question 3 (regarding ADS Valves) and Question 9 (regarding LCO 3.7.2, Condition B) provide the PRA and design basis success criteria for SSCs covered by each TS LCO within the RICT Program, and the basis for the PRA success criteria when it differed from the design basis success criteria. Consistent with NEI 06-09-A and the associated NRC SE, the RICTs calculated from the PRA will be based on the PRA success criteria, which have been peer reviewed and determined to meet ASME/ANS RA-Sa-2009, as endorsed by RG 1.200, Revision 2, and, therefore, is acceptable.

3.2.4.1.9 Application of PRA Models in the RICT Program

The Brunswick base PRA models determined to be acceptable above 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. Throughout the entirety of the LAR, and specifically in revised Table E1-1 of the November 1, 2021, LAR supplement, the licensee provided all information needed to support the requested LCO actions proposed for the Brunswick 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 information or the CRMP tool as described in the LAR and the November 1, 2021, LAR supplement. The NRC staff finds that the Brunswick 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 NRC staff concludes that the proposed application of the Brunswick RICT program is appropriate for use in the adoption of TSTF-505, Revision 2, for performing RICT calculations.

3.2.4.2 Tier 2: Avoidance of Risk Significant Plant Configurations

As prescribed in RG 1.177, Revision 1, the second tier evaluates the capability of the licensee to recognize and avoid risk significant plant configurations that could result if equipment, in addition to that associated with the proposed change, is taken out of service simultaneously or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The limits established for entry into a RICT and for RMA implementation are consistent with the guidance of NUMARC 93-01, Revision 4F, endorsed by RG 1.160, Revision 4 (References 26 and 27, respectively), as applicable to plant maintenance activities. The RICT program requirements and criteria are consistent with the principle of Tier 2 to avoid risk-significant configurations.

Consistent with NEI 06-09-A, LAR Enclosure 12 identifies three kinds of RMAs including (1) actions to increase risk awareness and control, (2) actions to reduce the duration of maintenance activities, and (3) actions to minimize the magnitude of the risk increase.

The LAR also explains that RMAs will be implemented, in accordance with current plant procedures, no later than the point at which the 1.0E-06 incremental core damage probability (ICDP) or 1.0E-07 incremental large early release probability (ILERP) threshold is reached and under emergent conditions when the instantaneous CDF and LERF thresholds are exceeded.

Based on the licensee's incorporation of NEI 06-09-A in the TS as discussed in LAR Attachment 1 and use of RMAs as discussed in LAR Enclosure 12, and because the proposed changes are consistent with the Tier 2 guidance of RG 1.177, Revision 1, the NRC staff finds that 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

The third tier provides that a licensee should develop a program that ensures that the risk impact of out-of-service 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 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 out-of-service equipment.

In LAR Enclosure 8, "Attributes of the Real Time Risk Model," 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. In LAR Enclosure 10, the licensee identified the attributes that the RICT program procedures will address, which are consistent with NEI 06-09-A.

The NRC staff reviewed the description of the training program provided in the LAR and concluded that the program is consistent with the training guidance set forth in NEI 06-09-A. Therefore, the NRC staff finds that the licensee has proposed acceptable administrative controls for the PRA and personnel implementing the RICT program and will establish appropriate programmatic and procedural controls for its RICT program, consistent with the guidance of

NEI 06-09-A, Section 3.2.1.

Based on the licensee's incorporation of NEI 06-09-A, in the TS, as discussed in LAR Attachment 1, 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 considering the impact of seismic events, non-seismic external hazards, and other 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 guidance in RG 1.177 and RG 1.174. 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 concludes 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 1, 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. An implementation and monitoring program is intended to ensure that the impact of the proposed TS change continues to reflect the availability of SSCs impacted by the change. Revision 3 of RG 1.174 states, in part, monitoring performed in conformance with the Maintenance Rule (MR), 10 CFR 50.65, can be used when the monitoring performed is sufficient for the SSCs affected by the risk informed application. LAR Enclosure 11 states that the SSCs in the scope of the RICT program are also in the scope of 10 CFR 50.65 for the MR. The MR monitoring programs will provide for evaluation and disposition of unavailability impacts which may be incurred from implementation of the RICT program. Furthermore, the licensee confirmed in Section 4.0 of LAR Enclosure 11 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. This evaluation assures that RICT program implementation satisfies the RG 1.174 guidance for small risk increases.

3.2.5.1 Key Principle 5 Conclusions

The NRC staff concludes 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 use this average annual increase to ensure the program, as implemented, meets RG 1.174 guidance for small risk increases; and (2) all affected SSCs are within the MR program, which is used to monitor changes to the reliability and availability of these SSCs.

3.2.6 Optional Changes and Variations from TSTF-505, Revision 2

The NRC staff evaluated the proposed use of RICTs in the optional changes and variations stated above in Section 2.2.4 in conjunction with evaluating the proposed use of RICTs in each of the individual LCO, Required Actions, and CTs stated above in Section 3.2.1. The NRC staff's evaluation of the licensee's proposed use of RICTs in the variations against the key safety principles is discussed above in Sections 3.2.1 through 3.2.5. Based on the above Sections 3.2.1 through 3.2.5, the NRC staff finds that each of the five key principles in RG 1.177 and RG 1.174 have been met and concludes that the proposed optional changes and variations are acceptable.

4.0 STAFF CONCLUSION

The NRC staff has evaluated the proposed changes against each of the five key principles in RG 1.177 and RG 1.174, including the optional variations from the approved TSTF-505 discussed in Section 2.2.4 of this SE. The NRC staff concludes that the changes proposed by the licensee satisfy the key principles of risk-informed decision-making identified in RG 1.177 and RG 1.174 and, therefore, the requested adoption of the proposed changes to the TSs and associated guidance is acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the North Carolina State official was notified of the proposed issuance of the amendments on March 2, 2022. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to 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 amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding in the *Federal Register* on June 15, 2021 (86 FR 31738), that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

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

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Principal Contributors: J. Ashcraft, NRR
M. Biro, NRR
W. Jessup, NRR
E. Kleeh, NRR
B. Lee, NRR
S. Sun, NRR
M. Valentin-Olmeda, NRR
K. West, NRR
D. Wu, NRR

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WJessup, NRR/UAL1
EKleeh, NRR/EEEB
JAshcraft, NRR/EICB
BLee, NRR/SCPB
SSun, NRR/SNSB
MBiro, NRR/APLA
MValentin-Olmeda, NRR/APLC

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OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DSS/STSB	NRR/DSS/SNSB/BC(A)
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DATE	3/21/2022	3/28/2022	3/31/2022	2/18/2022
OFFICE	NRR/DSS/SCPB/BC(A)	NRR/EICB/BC	NRR/DEX/EEEB/BC	NRR/DRA/APLA/BC
NAME	AStubbs	MWaters	WMorton	RPascarelli
DATE	3/18/2022	4/1/2022	3/15/2022	2/18/2022
OFFICE	NRR/DRA/APLC/BC	OGC (NLO)	NRR/DORL/LPL2-2/BC	NRR/DORL/LPL2-2/PM
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