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

August 29, 2017

Mr. William R. Gideon
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 AMENDMENTS TO ADOPT TSTF-423 "TECHNICAL SPECIFICATIONS END STATES, NEDC-32988-A" (CAC NOS. MF8466 AND MF8467)

Dear Mr. Gideon:

The U. S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment Nos. 280 and 308 to Renewed Facility Operating License Nos. DPR-71 and DPR-62 for Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2, respectively. These amendments are in response to your application dated September 28, 2016, as supplemented by letters dated March 25 and May 24, 2017. The amendments modify the technical specification (TS) required actions end states consistent with the NRC-approved Technical Specification Task Force (TSTF) traveler TSTF-423-A, Revision 1, "Technical Specifications End States, NEDC-32988 A," dated December 22, 2009. The revised BSEP Unit Nos. 1 and 2 TSs, for selected Required Action end states, allow entry into hot shutdown rather than cold shutdown to repair equipment, if risk is assessed and managed consistent with the program in place for complying with the requirements of Title 10 of *Code of Federal Regulation* Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants."

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

Sincerely,

Farideh E Saba

for Andrew Hon, 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. 280 to DPR-71
2. Amendment No. 308 to DPR-62
3. Safety Evaluation

cc w/enclosures: Distribution via Listserv

DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 280
Renewed License No. DPR-71

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

   A. The application for amendment filed by Duke Energy Progress, LLC, dated September 28, 2016, as supplemented by letters dated March 25 and May 24, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

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

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 280, 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 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION

for

Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License
and Technical Specifications

Date of Issuance: August 29, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 280

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 Pages	Insert Pages
3.5-2	3.5-2
3.5-3	3.5-3
3.5-4	3.5-4
3.5-12	3.5-12
3.6-16	3.6-16
3.6-18	3.6-18
3.6-24	3.6-24
3.6-28	3.6-28
3.6-33	3.6-33
3.7-2	3.7-2
3.7-3	3.7-3
3.7-12	3.7-12
3.7-15	3.7-15
3.7-16	3.7-16
3.7-18	3.7-18
3.8-6	3.8-6
3.8-24	3.8-24
3.8-36	3.8-36

(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. 280, 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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
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
	AND		
	D.2	Restore HPCI System to OPERABLE status.	14 days
E. HPCI System inoperable. AND One low pressure ECCS injection/spray subsystem is inoperable.	E.1	Restore HPCI System to OPERABLE status.	72 hours
	OR		
	E.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours
F. One required ADS valve inoperable.	F.1	Restore required ADS valve to OPERABLE status.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. One required ADS valve inoperable.	G.1	Restore required ADS valve to OPERABLE status.	72 hours
AND	OR		
One low pressure ECCS injection/spray subsystem inoperable.	G.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours
H. One required ADS valve inoperable.	H.1	Restore required ADS valve to OPERABLE status.	72 hours
AND	OR		
HPCI System inoperable.	H.2	Restore HPCI System to OPERABLE status.	72 hours
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
J. Two or more required ADS valves inoperable.	J.1	Be in MODE 3.	12 hours
	AND		
	J.2	Reduce reactor steam dome pressure to ≤ 150 psig.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A or B. OR 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) 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.	Immediately
	<u>AND</u>	
	A.2 Restore RCIC System to OPERABLE status.	14 days
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 (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
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
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
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.3 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
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.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1	Restore secondary containment to OPERABLE status.	8 hours
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. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the secondary containment, or during OPDRVs.	C.1	-------------NOTE------------- LCO 3.0.3 is not applicable. --------------------------------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
	AND		

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One SGT subsystem inoperable in MODE 1, 2 or 3.	A.1	Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR Two SGT subsystems inoperable in MODE 1, 2, or 3.	B.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
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
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. 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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	12 hours 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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3. <u>OR</u> Two CREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	C.1	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------------- Be in MODE 3.	12 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	-----------------NOTE----------------- LCO 3.0.3 is not applicable. ---		
	D.1	Place OPERABLE CREV subsystem in radiation/smoke protection mode.	Immediately
	<u>OR</u>		
	D.2.1	Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u>		
	D.2.2	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	D.2.3	Initiate action to suspend OPDRVs.	Immediately

(continued)

3.7 PLANT SYSTEMS

3.7.4 Control Room Air Conditioning (AC) System

LCO 3.7.4 Three control room AC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One control room AC subsystem inoperable.	A.1	Restore control room AC subsystem to OPERABLE status.	30 days
B. Two control room AC subsystems inoperable.	B.1	Restore one inoperable control room AC subsystem to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	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. Required Action and associated Completion Time of Condition A or B not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	-------------------NOTE------------------- LCO 3.0.3 is not applicable. ---	
	D.1 Place OPERABLE control room AC subsystem(s) in operation.	Immediately
	<u>OR</u>	
	D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u>	
	D.2.2 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	D.2.3 Initiate action to suspend OPDRVs.	Immediately
E. Three control room AC subsystems inoperable in MODE 1, 2, or 3.	E.1 -------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------------- Be in MODE 3.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.5 Main Condenser Offgas

LCO 3.7.5 The gross gamma activity rate of the noble gases measured at the main condenser air ejector shall be ≤ 243,600 μCi/second after decay of 30 minutes.

APPLICABILITY: MODE 1,

MODES 2 and 3 with any main steam line not isolated and steam jet air ejector (SJAE) in operation.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Gross gamma activity rate of the noble gases not within limit.	A.1	Restore gross gamma activity rate of the noble gases to within limit.	72 hours
B. Required Action and associated Completion Time not met.	B.1	Isolate all main steam lines.	12 hours
	OR		
	B.2	Isolate SJAE.	12 hours
	OR		
	B.3	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. -----------------------------------	
		Be in MODE 3.	12 hours

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.	12 hours
	OR		
	F.2	Restore DG to OPERABLE status.	12 hours
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
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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------	
		Be in MODE 3.	12 hours
C. Two or more DC electrical power subsystems inoperable.	C.1	Be in MODE 3.	12 hours
	AND		
	C.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 130 V on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 23.0 μohms for inter-cell connections and ≤ 82.8 μohms for inter-rack connections.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that degrades performance.	In accordance with the Surveillance Frequency Control 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>AND</u> 176 hours from discovery of failure to meet LCO
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

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. 308
Renewed License No. DPR-62

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

   A. The application for amendment filed by Duke Energy Progress, LLC, dated September 28, 2016, as supplemented by letters dated March 25 and May 24, 2017, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

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

   (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.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION

for

Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating License
and Technical Specifications

Date of Issuance: August 29, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 308

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 Pages	Insert Pages
3.5-2	3.5-2
3.5-3	3.5-3
3.5-4	3.5-4
3.5-12	3.5-12
3.6-16	3.6-16
3.6-18	3.6-18
3.6-24	3.6-24
3.6-28	3.6-28
3.6-33	3.6-33
3.7-2	3.7-2
3.7-3	3.7-3
3.7-12	3.7-12
3.7-15	3.7-15
3.7-16	3.7-16
3.7-18	3.7-18
3.8-6	3.8-6
3.8-24	3.8-24
3.8-36	3.8-36

(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. 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 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,

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
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
	AND		
	D.2	Restore HPCI System to OPERABLE status.	14 days
E. HPCI System inoperable. AND One low pressure ECCS injection/spray subsystem is inoperable.	E.1	Restore HPCI System to OPERABLE status.	72 hours
	OR		
	E.2	Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours
F. One required ADS valve inoperable.	F.1	Restore required ADS valve to OPERABLE status.	14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. One required ADS valve inoperable. AND One low pressure ECCS injection/spray subsystem inoperable.	G.1 OR G.2	Restore required ADS valve to OPERABLE status. Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
H. One required ADS valve inoperable. AND HPCI System inoperable.	H.1 OR H.2	Restore required ADS valve to OPERABLE status. Restore HPCI System to OPERABLE status.	72 hours 72 hours
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
J. Two or more required ADS valves inoperable.	J.1 AND J.2	Be in MODE 3. Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
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) 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.	Immediately
	AND	
	A.2 Restore RCIC System to OPERABLE status.	14 days
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 (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
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 <u>AND</u> H.2	Be in MODE 3. 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
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
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.3 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
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>	Be in MODE 3.	12 hours
	D.2	Be in MODE 4.	36 hours

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1	Restore secondary containment to OPERABLE status.	8 hours
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. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the secondary containment, or during OPDRVs.	C.1	-------------NOTE------------- LCO 3.0.3 is not applicable. ----------------------------------	
		Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
	AND		
			(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable in MODE 1, 2 or 3.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR Two SGT subsystems inoperable in MODE 1, 2, or 3.	B.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
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
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. 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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	12 hours 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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3. OR Two CREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	C.1	------------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------ Be in MODE 3.	12 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	----------------NOTE---------------- LCO 3.0.3 is not applicable. ------------------------------------		
	D.1	Place OPERABLE CREV subsystem in radiation/smoke protection mode.	Immediately
	OR		
	D.2.1	Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND		
	D.2.2	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2.3	Initiate action to suspend OPDRVs.	Immediately

(continued)

3.7 PLANT SYSTEMS

3.7.4 Control Room Air Conditioning (AC) System

LCO 3.7.4 Three control room AC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One control room AC subsystem inoperable.	A.1 Restore control room AC subsystem to OPERABLE status.	30 days
B. Two control room AC subsystems inoperable.	B.1 Restore one inoperable control room AC subsystem to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	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. Required Action and associated Completion Time of Condition A or B not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	--------------------NOTE-------------------- LCO 3.0.3 is not applicable. ---	
	D.1 Place OPERABLE control room AC subsystem(s) in operation.	Immediately
	OR	
	D.2.1 Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND	
	D.2.2 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2.3 Initiate action to suspend OPDRVs.	Immediately
E. Three control room AC subsystems inoperable in MODE 1, 2, or 3.	E.1 -------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------------	
	Be in MODE 3.	12 hours

(continued)

3.7 PLANT SYSTEMS

3.7.5 Main Condenser Offgas

LCO 3.7.5 The gross gamma activity rate of the noble gases measured at the main condenser air ejector shall be ≤ 243,600 μCi/second after decay of 30 minutes.

APPLICABILITY: MODE 1,
MODES 2 and 3 with any main steam line not isolated and steam jet air ejector (SJAE) in operation.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Gross gamma activity rate of the noble gases not within limit.	A.1	Restore gross gamma activity rate of the noble gases to within limit.	72 hours
B. Required Action and associated Completion Time not met.	B.1	Isolate all main steam lines.	12 hours
	<u>OR</u>		
	B.2	Isolate SJAE.	12 hours
	<u>OR</u>		
	B.3	-------------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. -----------------------------------	
		Be in MODE 3.	12 hours

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.	12 hours
	OR		
	F.2	Restore DG to OPERABLE status.	12 hours
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
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

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	------------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 3. -------------------------------- Be in MODE 3.	 12 hours
C. Two or more DC electrical power subsystems inoperable.	C.1	Be in MODE 3.	12 hours
	AND		
	C.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 130 V on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 23.0 μohms for inter-cell connections and ≤ 82.8 μohms for inter-rack connections.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that degrades performance.	In accordance with the Surveillance Frequency Control 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 AND 176 hours from discovery of failure to meet LCO
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

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 280 AND 308

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

DUKE ENERGY PROGRESS, LLC

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated September 28, 2016 (Reference 1), as supplemented by letters dated March 25 and May 24, 2017 (References 2 and 3, respectively), Duke Energy Progress, LLC (Duke Energy, the Licensee), submitted a License Amendment Request (LAR) that proposed changes to its Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2 Technical Specifications (TSs). The amendments would modify the TS required actions end states consistent with the U.S. Nuclear Regulatory Commission (NRC)-approved Technical Specification Task Force (TSTF) traveler TSTF-423-A, Revision 1, "Technical Specifications End States, NEDC-32988-A," dated December 22, 2009 (Reference 4).

TS Actions End States modifications would permit, for some systems, entry into a hot shutdown (Mode 3) end state rather than a cold shutdown (Mode 4) end state, which is the current TS requirement.

The following five operational modes are defined in the BSEP Unit Nos. 1 and 2 TSs. Of specific relevance to TSTF-423 are Modes 3 and 4:

Mode 1 - Power Operation: The reactor mode switch is in run position.

Mode 2 - Reactor Startup: The reactor mode switch is in refuel position (with all reactor vessel head closure bolts fully tensioned) or in startup/hot standby position.

Mode 3 – Hot Shutdown: The reactor coolant system (RCS) temperature is above 212 degrees Fahrenheit (°F), and the reactor mode switch is in shutdown position (with all reactor vessel head closure bolts fully tensioned).

Mode 4 - Cold Shutdown: The RCS temperature is equal to or less than 212°F, and the reactor mode switch is in shutdown position (with all reactor vessel head closure bolts fully tensioned).

Mode 5 - Refueling: The reactor mode switch is in shutdown or refuel position, and one or more reactor vessel head closure bolts are less than fully tensioned.

Most of the current TSs and design-basis analyses were developed under the perception that putting a plant in cold shutdown would result in the safest condition, and the design-basis analyses would bound credible shutdown accidents. In the late 1980s and early 1990s, the NRC and licensees recognized that this perception was incorrect and took corrective actions to improve shutdown operation. At the same time, Standard Technical Specifications (STSs) were developed, and many licensees adopted the STSs. Since enactment of a shutdown rule was expected, almost all TS changes involving power operation, including a revised end state requirement, were postponed (e.g., the Final Policy Statement on Technical Specification Improvements (Reference 5)). However, in the mid-1990s, the Commission decided a shutdown rule was not necessary in light of industry improvements.

The STSs and most plant TSs provide, as part of the remedial action, a Completion Time (CT) for the plant to either comply with remedial actions or restore compliance with the Limiting Condition for Operation (LCO). If the LCO or the remedial action cannot be met, then the reactor is required to be shut down. When the STSs and individual plant TSs were written, the shutdown condition, or "end state," specified was usually cold shutdown.

The supplements dated March 25 and May 24, 2017, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination, as published in the *Federal Register* (FR) on December 6, 2016 (81 FR 87968).

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.90 states that whenever a holder of an operating license (OL) desires to amend the license (in this case, a TSTF-423 amendment), application for an amendment must be filed with the Commission, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications. As stated in 10 CFR 50.36(a)(1), each applicant for an OL shall include in its application proposed TSs in accordance with the requirements of 10 CFR 50.36. Further, per 10 CFR 50.36(a)(1), 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 TSs.

In 10 CFR 50.36, "Technical specifications," the Commission established its regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36(c), TSs, in part, are required to include items in the following specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. The regulation in 10 CFR 50.36(c)(2)(i) states, in part, that:

> Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

Licensees control shutdown risk by controlling conditions that can cause potential initiating events and responses to those initiating events that do occur. Initiating events are a function of equipment malfunctions and human error. Responses to events are a function of plant sensitivity, ongoing activities, human error, defense-in-depth (DID), and additional equipment malfunctions. In practice, the risk during shutdown operations is often addressed by voluntary actions and the application of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," which is called the Maintenance Rule. The regulation in 10 CFR 50.65(a)(4) states, in part, that:

> Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk informed evaluation process has shown to be significant to public health and safety.

As described in 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Considerations common to many types of licenses that guide the Commission's determination as to whether a license will be issued are provided in 10 CFR 50.40. The specific findings that the Commission must make to issue an OL are given in 10 CFR 50.57(a). Therefore, to issue amended TSs containing modified end states, the Commission must find, among other things, that the remedial actions permitted by the TSs (i.e., the modified end states), when considered as part of the overall activities authorized by the license, provide reasonable assurance that the health and safety of the public will not be endangered.

The NRC-approved Boiling Water Reactor (BWR) Owners Group (BWROG) Topical Report (TR) NEDC-32988-A, Revision 2, "Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for Boiling Water Reactor Plants" (hereinafter "NEDC-32988-A") (Reference 6), provides the technical basis to change certain required "end states" when the TS actions for remaining in power operation cannot be met within the CTs. The "end states," are part of the remedial actions described by 10 CFR 50.36(c)(2)(i) in that they are an action other than shutting down the reactor.

Most of the requested TS changes permit an end state of hot shutdown (Mode 3) if risk is assessed and managed rather than an end state of cold shutdown (Mode 4) contained in the current TSs. In describing the basis for changing end states, NEDC-32988-A states, in part, that:

> Cold shutdown is normally required when an inoperable system or train cannot be restored to an operable status within the allowed time. Going to cold shutdown results in the loss of steam-driven systems, challenges the shutdown heat removal systems, and requires restarting the plant. A more preferred operational mode is one that maintains adequate risk levels while repairs are completed without causing unnecessary challenges to plant equipment during shutdown and startup transitions.

The NRC's safety evaluation (SE) for TR NEDC-32988, Revision 2, dated September 27, 2002 (Reference 7), states, in part, that:

> In the end state changes considered here, the malfunction of a component or train has generally resulted in a failure to meet a TS and a controlled shutdown has begun because a TS CT has been exceeded.

TSTF-423-A, Revision 1, incorporates the NRC approved NEDC-32988-A into NUREG-1433, Revision 4, "Standard Technical Specifications – General Electric Plants (BWR/4)" (Reference 8) (and hereby referred to as the STSs throughout this SE), and NUREG-1434, Revision 4, "Standard Technical Specifications – General Electric Plants (BWR/6)" (Reference 9). The conclusions are applicable for all of the BWR products (BWR/2 through BWR/6). The FR notice (Reference 10) published on February 18, 2011 (76 FR 9614), announced the availability of this TS improvement as part of the consolidated line item improvement process.

The licensee states that it reviewed BWROG NEDC-32988-A, TSTF 423, Revision 1, and the NRC staff's model SE (Reference 11), and concluded that the information provided in these three documents is applicable to BSEP, Units 1 and 2, and justifies this LAR for incorporation of the changes to the BSEP TSs. The TSTF-423 justification references Regulatory Guide (RG) 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants" (Reference 12). On November 27, 2012, the NRC published a FR notice stating that RG 1.182 has been withdrawn, and the subject matter has been incorporated into RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (Reference 13). RG 1.160 endorses NUMARC 93-01, Revision 4A, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (Reference 14).

Duke Energy's supplement letter, dated March 25, 2017 (Reference 2), states:

> Duke Energy confirms that BSEP's current licensing basis adheres to Regulatory Guide 1.160 and commits to follow the guidance in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Nuclear Management and Resource Council," Revision 4A, April 2011. Enclosure 2 contains revised commitments reflecting the BSEP current licensing basis.

3.0 TECHNICAL EVALUATION

The licensee proposed to change certain required end states when the TS actions for remaining in power operation cannot be met within the CTs. Most of the requested TS changes permit an end state of hot shutdown (Mode 3) if risk is assessed and managed, rather than an end state of cold shutdown (Mode 4), which is contained in the current TSs. The changes were limited to those end states where: (1) entry into the shutdown mode is for a short interval, (2) entry is initiated by inoperability of a single train of equipment or a restriction on a plant operational parameter, unless otherwise stated in the applicable TSs, and (3) the primary purpose is to correct the initiating condition and return to power operation as soon as is practical. Risk insights from both the qualitative and quantitative risk assessments were used in specific TS assessments.

Each proposed TS change is reviewed individually in Section 3.2 of this SE.

3.1 Risk Assessment

The objective of the BWROG NEDC-32988, Revision 2, risk assessment was to show that any risk increases associated with the proposed changes in TS end states are either negligible or negative (i.e., a net decrease in risk). NEDC-32988 documents a risk informed analysis of the proposed TS change. Probabilistic risk assessment (PRA) results and insights are used in combination with results of deterministic assessments to identify and propose changes in "end states" for all BWR plants. This is in accordance with guidance provided in RG 1.174, "An Approach for Using PRA in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (Reference 15), and RG 1.177, "An Approach for Plant Specific Risk-Informed Decisionmaking: Technical Specifications" (Reference 16). The three-tiered approach documented in RG 1.177 was followed. The Tier 1 of the three tiered approach includes the assessment of the risk impact of the proposed change for comparison to acceptance guidelines consistent with the Commission's Safety Goal Policy Statement, as documented in RG 1.174. The first tier aims at ensuring that there are no unacceptable temporary risk increases as a result of the TS change, such as when equipment is taken out of service. Tier 2 is an identification of potentially high-risk configurations that could exist if equipment, in addition to that associated with the change, were to be taken out of service simultaneously or other risk-significant operational factors, such as concurrent system or equipment testing, were also involved. Tier 3 addresses the application of 10 CFR 50.65(a)(4) of the Maintenance Rule for identifying risk-significant configurations resulting from maintenance-related activities and taking appropriate compensatory measures to avoid such configurations.

The TSs invoke a risk assessment because 10 CFR 50.65(a)(4) is applicable to maintenance related activities and does not cover other operational activities beyond the effect they may have on existing maintenance-related risk.

The BWROG risk assessment approach was found to be acceptable in the SE for NEDC-32988, Revision 2. In addition, the analyses show that the three tiered approach criteria for allowing TS changes are met as follows:

- <u>Risk Impact of the Proposed Change (Tier 1):</u>

  The risk changes associated with the TS changes in TSTF-423 in terms of mean yearly increases in core damage frequency (CDF) and large early release frequency (LERF) are risk neutral or risk beneficial. In addition, there are no significant temporary risk increases as defined by RG 1.177 criteria associated with the implementation of the TS end state changes.

- <u>Avoidance of Risk-Significant Configurations (Tier 2):</u>

  The performed risk analyses, which are based on single LCOs, indicate that there are no high risk configurations associated with the TS end state changes. The reliability of redundant trains is normally covered by a single LCO. When multiple LCOs occur, which affect trains in several systems, the plant's risk-informed configuration risk management program, or the risk assessment and management program implemented in response to the Maintenance Rule (10 CFR 50.65 (a)(4)), shall ensure that high-risk configurations are avoided. As part of the implementation of TSTF-423, the licensee has committed to follow Section 11 of NUMARC 93-01, Revision 3 (Reference 17), and include guidance in appropriate plant procedures and/or administrative controls to preclude high-risk plant configurations when the plant is at the proposed end state. This commitment shall be incorporated into the licensee's Final Safety Analysis Report (FSAR), as discussed in Section 3.3 of this SE. The NRC staff finds that such guidance is adequate for preventing risk-significant plant configurations.

- Configuration Risk Management (Tier 3):

  The licensee has a program in place to ensure compliance with 10 CFR 50.65(a)(4) to assess and manage the risk from maintenance activities. This program can support the licensee's decision in selecting the appropriate actions to control risk for most cases in which a risk informed TS is entered.

  The generic risk impact of the end state mode change was evaluated, subject to the following assumptions and TSTF-IG-05-02, "Implementation Guidance for TSTF-423, Revision 0" (Reference 18).

  1. The entry into the end state is initiated by the inoperability of a single train of equipment or a restriction on a plant operational parameter, unless otherwise stated in the applicable TS.

  2. The primary purpose of entering the end state is to correct the initiating condition and return to power as soon as is practical.

  3. When Mode 3 is entered as the repair end state, the time the reactor coolant pressure is above 500 pounds per square inch gauge (psig) will be minimized. If reactor coolant pressure is above 500 psig for more than 12 hours, the associated plant risk will be assessed and managed.

These assumptions are consistent with typical entries into Mode 3 for short duration repairs, which is the intended use of the TS end state changes. The NRC staff concludes that going to Mode 3 (hot shutdown) instead of going to Mode 4 (cold shutdown) to carry out equipment repairs, which are of short duration, does not have any adverse effect on plant risk.

3.2 Assessment of TS Changes:

Addition of a Note Regarding LCO 3.0.4.a:

The existing TSs for BSEP, Units 1 and 2, include the following requirement in LCO 3.0.4:

> When an LCO is not met, entry into a MODE or other specified Condition in the Applicability shall only be made:
>
> a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time,
>
> b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this specification are stated in the individual Specifications, or
>
> c. When an allowance is stated in the individual value, parameter, or other Specification.

> This Specification shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

Adoption of TSTF-423 requires the following Note be added to each Required Action where the end state is changed to Mode 3:

> LCO 3.0.4.a is not applicable when entering MODE 3.

The Note prohibits entry into Mode 3 within the applicability using the provision of LCO 3.0.4.a. The purpose of this Note is to provide assurance that entry into Mode 3 is not made without the appropriate risk assessment described in LCO 3.0.4.b.

The addition of this Note is acceptable because it prevents an inappropriate use of the LCO 3.0.4.a allowance to go into Mode 3 with the specified system being inoperable.

Since the basis for the Note is the same for all affected BSEP LCOs, the NRC staff's discussion on the basis for acceptance is not repeated in each assessment below. In most cases, BSEP Unit 1 and 2 are identical. Therefore, Unit 1 is described herein; Unit 2 is similar. Where differences exist, they will be noted below.

3.2.1 TS 3.3.8.2, "Reactor Protection System (RPS) Electric Power Monitoring"

The Reactor Protection System (RPS) Electric Power Monitoring System is provided to isolate the RPS bus from the normal uninterruptible power supply or an alternate power supply in the event of over voltage, under voltage, or under frequency.

The licensee stated:

> No changes to BSEP TS 3.3.8.2 are proposed. The existing BSEP TS 3.3.8.2 does not include a Required Action to be in Mode 4. Therefore, no change is necessary.

The NRC staff reviewed the licensee's proposed variation and finds it acceptable since the variation does not affect the staff's justification for the licensee's proposed adoption of TSTF-423.

3.2.2 TS 3.4.3, "Safety/Relief Valves"

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requires the reactor pressure vessel be protected from overpressure during upset conditions by self-actuated safety valves. As part of the nuclear pressure relief system, the size and number of safety/relief valves are selected such that peak pressure in the nuclear system will not exceed the ASME Code limits for the reactor coolant pressure boundary.

The licensee stated:

> No changes to BSEP TS 3.4.3 are proposed. The Standard TS, Condition A is not applicable to BSEP. BSEP TS 3.4.3, Condition A, corresponds to the proposed Condition C in TSTF-423; which includes the Mode 4 requirement. Therefore, no changes are proposed to BSEP TS 3.4.3.

The NRC staff reviewed the licensee's proposed variation and finds it acceptable since the variation does not affect the staff's justification for the licensee's proposed adoption of TSTF-423.

3.2.3 TS 3.5.1, "Emergency Core Cooling System (ECCS) – Operating"

The ECCS is designed, in conjunction with the primary and secondary containment, to limit the release of radioactive materials to the environment following a loss-of-coolant accident (LOCA). The ECCS uses two independent methods (flooding and spraying) to cool the core during a LOCA. The ECCS network consists of the high pressure coolant injection (HPCI) system, the core spray (CS) system, the low pressure core injection (LPCI) mode of the Residual Heat Removal (RHR) system, and the automatic depressurization system (ADS). The suppression pool provides the required source of water for the ECCS. Although no credit is taken in the safety analyses for the condensate storage tank, it is capable of providing a source of water for the HPCI and CS systems.

<u>Proposed Modifications for End State Required Actions and Completion Times:</u>

- Current TS 3.5.1 Condition C states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.5.1 Condition C would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------- C.1 Be in MODE 3. ~~AND~~ ~~C.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

- New Condition I is proposed as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
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

- Current TS 3.5.1 Condition I states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. Required Action and associated Completion Time of Condition D, E, F, G or H not met. <u>OR</u> Two or more required ADS valves inoperable.	I.1 Be in MODE 3. <u>AND</u> I.2 Reduce reactor steam pressure to ≤ 150 psig.	12 hours 36 hours

Revised TS 3.5.1 Condition I (<u>renumbered as Condition J</u>) would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~I~~J. ~~Required Action and associated Completion Time of Condition D, E, F, G or H not met.~~ ~~OR~~ Two or more required ADS valves inoperable.	~~I~~J.1 Be in MODE 3 <u>AND</u> ~~I~~J.2 Reduce reactor steam pressure to ≤ 150 psig	12 hours 36 hours

Current TS 3.5.1 Condition J is renumbered to a new Condition K with no change in the Required Actions, except TS 3.5.1 Required Action J.1 is renumbered to K.1.

<u>Variations to TSTF-423-A, Revision 1, or the STSs</u>:

BSEP LAR (Reference 1, page 2) states the following for the LCO 3.5.1 proposed changes:

> Condition C of BSEP TS 3.5.1 Operating is proposed to be revised per TSTF-423; however, it applies when Conditions A or B are not met. Conditions in BSEP TS 3.5.1 are numbered differently from the Standard TS Conditions.
>
> Condition A of the Standard TS and Condition A of the BSEP TS 3.5.1 are equivalent. BSEP TS 3.5.1 includes Condition B for one Low Pressure Coolant Injection (LPCI) pump and one Core Spray (CS) subsystem inoperable concurrently. The justification provided in the topical report and model Safety Evaluation for this change is also applicable to Condition B of the BSEP TS 3.5.1.

Since the licensee's proposed change to LCO 3.5.1 deviated from the NRC staff's approved TSTF-423, the staff requested additional information from the licensee via letter dated February 3, 2017 (ADAMS Accession NO. ML17037A002), with the following request:

> Please provide Emergency Core Cooling Systems (ECCS) analysis and containment analysis and results to verify acceptable ECCS performance, containment integrity, Environmental Equipment Qualification (EEQ), and containment heat removal for a design basis Loss of Coolant Accident (LOCA) in Mode 3 when one LPCI pump and one CS pump are concurrently inoperable in this mode.

The licensee's letter dated March 25, 2017 (Reference 2) followed by a clarification letter dated May 24, 2017, (Reference 3) provided a detailed response to the NRC staff's request for additional information (RAI). The letter dated May 24, 2017, stated:

> The proposed BSEP markup eliminates proceeding to Mode 4 for Condition B of TS 3.5.1. Having one LPCI and one CS pump inoperable represents a maximum level of degradation of two of six low pressure ECCS pumps; consistent with that allowed in Condition A. As such, the BSEP justification for the change to BSEP TS 3.5.1 Condition B is that the justification provided in Topical Report NEDC-32988-A for a maximum level of degradation of two of six low pressure ECCS pumps (i.e., a total of two LPCI pumps) provided in TS 3.5.1 Condition A is also applicable to a maximum level of degradation of two of six low pressure ECCS pumps (i.e., one LPCI pump and one CS pump) provided in TS 3.5.1 Condition B. The mitigation capability of having one LPCI pump and one CS pump inoperable is not significantly different than having two LPCI pumps inoperable. Duke Energy's March 25, 2017, response to NRC RAI 2 demonstrates that BSEP is analyzed for concurrent inoperability of one CS and one LPCI pump. The BSEP LOCA analysis demonstrates that the consequences of a LOCA with one CS and one LPCI pump inoperable are mitigated to within acceptable regulatory limits. The BSEP LOCA analysis is performed at 102 percent of Rated Thermal Power (RTP) and fully bounds a hypothetical Mode 3 LOCA. Additionally, BSEP has committed to follow the guidance established in TSTF-IG-05-02, Revision 2, "Implementation Guidance for TSTF-423, Revision 1, 'Technical Specifications End States, NEDC-32988-A.'" Therefore, entry into Mode 3 from either Condition A or Condition B will be limited to no more than seven days.

The NRC staff's review of the letter determined that the licensee's response is adequate (as explained below) for determining that BSEP's proposed change to BSEP TS 3.5.1 Condition B is acceptable.

<u>NRC Staff Assessment:</u>

The BWROG performed a comparative PRA evaluation in NEDC-32988-A of the core damage risks of operation in the current Mode 4 end state and the proposed Mode 3 end state. The NRC staff's conclusion described in the SE (Reference 06) for NEDC-32988, Revision 2, on the BWROG PRA evaluation indicates that the core damage risks are lower in Mode 3 than in Mode 4. For BSEP, going to Mode 4 for one ECCS subsystem would cause loss of the HPCI/reactor core isolation cooling (RCIC) systems and loss of the power conversion system (condenser/feedwater) and would require activating the RHR system. In addition, Emergency Operating Procedures (EOPs) direct the operator to take control of the depressurization function if low pressure injection/spray systems are needed for RPV water makeup and cooling.

Based on the low probability of loss of the reactor coolant inventory and the number of systems available in Mode 3, the NRC staff concludes that the risks of staying in Mode 3 are approximately the same as, and in some cases lower than, the risks of going to Mode 4 end state; therefore, the change is acceptable.

Referring to Condition C of TS 3.5.1, the NRC staff agrees with the licensee's above justification for elimination of entry in to Mode 4 if Condition B of TS 3.5.1 is not met because the concurrent inoperability of one CS and one LPCI in Condition B, which represents availability of four ECCSs (one CS and three LPCI) pumps is consistent with the number of ECCS pumps available (four out of six) in Condition A. The required CS flow of 4100 gallons per minute (gpm) (FSAR Table 6-19) provided by one pump, and LPCI flow of 19600 gpm (FSAR Figure 5-17) provided by two LPCI pumps for the mitigation of a Mode 3 LOCA would be available in both Conditions A and B of TS 3.5.1.

Additionally, the NRC staff reviewed the differences between the BSEP TSs and the TSs in the TSTF-423 SE regarding the ECCS and determined that the differentiation does not invalidate the applicability of the TSTF-423 changes; therefore, the NRC staff finding the proposed change remains acceptable.

3.2.4 TS 3.5.3, "REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM"

The RCIC system is not part of the ECCS; however, the RCIC system is included with the ECCS section because of its similar functions.

The RCIC system is designed to operate either automatically or manually following RPV isolation accompanied by a loss of coolant flow from the feedwater system to provide adequate core cooling and control of the RPV water level. Under these conditions, the HPCI and RCIC systems perform similar functions.

Proposed Modifications for End State Required Actions:

Current TS 3.5.3 Condition B states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	12 hours
	B.2 Reduce reactor steam pressure to ≤ 150 psig.	36 hours

Revised TS 3.5.1 Condition B would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	I.1 ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3.	

	------------------------------ B.1 Be in MODE 3.	12 hours
	~~AND~~	
	~~B.2 Reduce reactor steam pressure to ≤ 150 psig.~~	~~36 hours~~

NRC Staff Assessment:

This change would allow the inoperable RCIC system to be repaired in a plant operating mode with lower risk and without challenging the normal shutdown systems. NEDC-32988-A did a comparative PRA evaluation of the core damage risks of operation in the current end state and in the Mode 3 end state. The evaluation indicates that the core damage risks are lower in Mode 3 than in Mode 4. Going to Mode 3 with reactor steam dome pressure less than or equal to 150 psig for inoperability of RCIC would also cause loss of the high pressure steam-driven injection system (RCIC/HPCI) and loss of the power conversion system (condenser/feedwater) and would require activating the RHR system. In addition, EOPs direct the operator to take control of the depressurization function if low pressure injection/spray systems are needed for RPV water makeup and cooling. Based on the low probability of loss of the necessary overpressure protection function and the number of systems available in Mode 3, the NRC staff concludes that the risks of staying in Mode 3 are approximately the same as, and in some cases lower than, the risks of going to Mode 4 end state; therefore, the change is acceptable.

3.2.5 TS 3.6.1.5, "Reactor Building-to-Suppression Chamber Vacuum Breakers"

The function of the reactor building-to-suppression chamber vacuum breakers is to relieve vacuum when primary containment depressurizes below reactor building pressure. If the drywell depressurizes below reactor building pressure, the negative differential pressure is mitigated by flow through the reactor building-to-suppression chamber vacuum breakers and through the suppression-chamber-to-drywell vacuum breakers. The design of the external (reactor building-to-suppression chamber) vacuum relief provisions consists of two vacuum breakers (a mechanical vacuum breaker and an air-operated butterfly valve) located in series in each of two 20-inch lines from the reactor building to the suppression chamber airspace.

Proposed Modifications for End State Required Actions and Completion Times:

- New TS 3.6.1.5 Condition F is added as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition E not met.	----------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------	
	F.1 Be in MODE 3	12 hours

- Current TS 3.6.1.5 Condition F is renumbered to be new Condition G with no change to the end state. Required Action F.1 is renumbered to be G.1.

- Current TS 3.6.1.5 Condition G states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time not met.	G.1 Be in MODE 3. AND G.2 BE in MODE 4.	12 hours 36 hours

Revised TS 3.6.1.5 Condition G (<u>renumbered as Condition H</u>) would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~G~~H. Required Action and associated Completion Time of Condition A, B, C, D, F or G not met	~~G~~H.1 Be in MODE 3. AND ~~G~~H.2 BE in MODE 4	12 hours 36 hours

<u>NRC Staff Assessment:</u>

NEDC-32988-A has determined that the specific failure condition of interest is not risk significant in BWR PRAs. The reduced end state would only be applicable to the situation where the vacuum breaker(s) in one line with one or more reactor building to suppression chamber vacuum breakers inoperable for opening with the remaining operable vacuum breakers capable of providing the necessary vacuum relief function. The existing end state remains unchanged, as established by new Condition F, for conditions involving one line with one or more vacuum breakers inoperable for opening, since they are needed in Modes 1, 2, and 3. In Mode 3, for other accident considerations, HPCI, RCIC, and the power conversion system (condensate/feedwater) remain available for water makeup and decay heat removal. Additionally, the EOPs direct the operators to take control of the depressurization function if low pressure injection/spray systems are needed for reactor coolant makeup and cooling. Because DID is maintained with respect to water makeup and decay heat removal by remaining in Mode 3, the NRC staff concludes that the change is acceptable.

3.2.6 <u>TS 3.6.1.6, "Suppression Chamber-to-Drywell Vacuum Breakers"</u>

The function of the suppression chamber-to-drywell vacuum breakers is to relieve vacuum in the drywell. There are 10 internal vacuum breakers located on the vent header of the vent system between the drywell and the suppression chamber, which allow air and steam flow from the suppression chamber to the drywell when the drywell is at a negative pressure with respect to the suppression chamber. Therefore, suppression chamber-to-drywell vacuum breakers prevent an excessive negative differential pressure across the wetwell drywell boundary. Each vacuum breaker is a self-actuating valve, similar to a check valve, which can be remotely operated for testing purposes.

Proposed Modifications for End State Required Actions and Completion Times:

- New TS 3.6.1.6 Condition B is added as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	----------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------- B.1 Be in MODE 3	 12 hours

- Current TS 3.6.1.6 Condition B states as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One suppression chamber- to drywell vacuum breaker not closed	B.1 Close the open vacuum breaker..	4 hours

Revised TS 3.6.1.6 Condition B renumbered as Condition C would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B~~C. One suppression chamber- to drywell vacuum breaker not closed	~~B.~~C.1 Close the open vacuum breaker..	4 hours

- Current TS 3.6.1.6 Condition C states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 BE in MODE 4.	12 hours 36 hours

Revised TS 3.6.1.6 Condition C (renumbered as Condition D) would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C~~D. Required Action and associated Completion Time of Condition C not met	~~C~~D.1 Be in MODE 3. AND ~~C~~D.2 BE in MODE 4	12 hours 36 hours

NRC Staff Assessment:

NEDC-32988-A has determined that the specific failure of interest is not risk significant in BWR PRAs. The reduced end state would only be applicable to the situation where one required suppression chamber-to-drywell vacuum breaker is inoperable for opening, with the remaining operable vacuum breakers capable of providing the necessary vacuum relief function, since they are required in Modes 1, 2, and 3. By remaining in Mode 3, HPCI, RCIC, and the power conversion system (condensate/feedwater) remain available for water makeup and decay heat removal. Additionally, the EOPs direct the operators to take control of the depressurization function if low pressure injection/spray systems are needed for RCS makeup and cooling. Therefore, DID is maintained with respect to water makeup and decay heat removal by remaining in Mode 3. The existing end state remains unchanged for conditions involving any suppression chamber-to-drywell vacuum breakers that are stuck open, as established by new Conditions C and D; therefore, the NRC staff concludes that the change is acceptable.

3.2.7 TS 3.6.2.3, "Residual Heat Removal Suppression (RHR) Pool Cooling"

Following a design-basis accident (DBA), the RHR suppression pool cooling system removes heat from the suppression pool. The suppression pool is designed to absorb the sudden input of heat from the primary system. In the long term, the pool continues to absorb residual heat generated by fuel in the reactor core. Some means must be provided to remove heat from the suppression pool so that the temperature inside the primary containment remains within design limits. This function is provided by two redundant RHR suppression pool cooling subsystems. The purpose of this LCO is to ensure that both subsystems are operable in applicable modes.

Proposed Modifications for End State Required Actions and Completion Times:

- New TS 3.6.2.3 Condition B is added as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	----------NOTE------------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------- B.1 Be in MODE 3	 12 hours

- Current TS 3.6.2.3 Condition B is renumbered to be new Condition C as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B~~C. Two RHR suppression pool cooling subsystems inoperable.	~~B~~C.1 Restore one RHR 8 hours suppression pool cooling subsystem to OPERABLE status.	8 hours

- Current TS 3.6.2.3 Condition C states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3 AND C.2 Be in MODE 4	12 hours 36 hours

Revised TS 3.6.2.3 Condition C (renumbered as Condition D) would state:

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

NRC Staff Assessment:

BWROG completed a comparative PRA evaluation of the core damage risks of operation in the current end state versus operation in the Mode 3 end state. The results described in NEDC-32988-A, and as evaluated by the NRC staff in the associated SE, indicated that the core damage risks while operating in Mode 3 (assuming the individual failure conditions) are lower or comparable to the current end state. One loop of the RHR suppression pool cooling system is sufficient to accomplish the required safety function. By remaining in Mode 3, HPCI, RCIC, and the power conversion system (condensate/feedwater) remain available for water makeup and RHR. Additionally, the plant EOPs direct the operators to take control of the depressurization function if low pressure injection/spray are needed for RCS makeup and cooling. Since DID is improved with respect to water makeup and RHR by remaining in Mode 3, the NRC staff concludes that the change is acceptable.

3.2.8 TS 3.6.2.4, "Residual Heat Removal (RHR) Suppression Pool Spray"

Following a DBA, the RHR suppression pool spray system removes heat from the suppression chamber airspace.

The licensee stated,

> No changes to BSEP TS 3.6.2.4 are proposed. The existing BSEP TSs do not include a specification RHR Suppression Pool Spray.

The NRC staff reviewed the licensee's proposed variation and finds it acceptable since the variation does not affect the staff's justification for the licensee's proposed adoption of TSTF-423.

3.2.9 TS 3.6.4.1, "Secondary Containment"

The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment following a DBA. In conjunction with operation of the standby gas treatment (SGT) system and closure of certain valves whose lines penetrate the secondary containment, the secondary containment is designed to reduce the activity level of the fission products prior to release to the environment and to isolate and contain fission products that are released during certain operations that take place inside primary containment, when primary containment is not required to be OPERABLE, or that take place outside primary containment.

Proposed Modifications for End State Required Actions:

Current TS 3.6.4.1 Condition B states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A or B not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.5.1 Condition B would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A or B not met.	----------NOTE--------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------- B.1 Be in MODE 3. ~~AND~~ ~~B.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

NRC Staff Assessment:

This LCO entry condition does not include gross leakage through an un-isolable release path. BWROG concluded in NEDC-32988-A that previous generic PRA work related to Appendix J to 10 CFR Part 50 requirements has shown that containment leakage is not risk significant. The primary containment and all other primary and secondary containment-related functions would still be operable, including the SGT system, thereby minimizing the likelihood of an unacceptable release. By remaining in Mode 3, HPCI, RCIC, and the power conversion system (condensate/feedwater) remain available for water makeup and RHR. Additionally, the plant EOPs direct the operators to take control of the depressurization function if low pressure injection/spray is needed for RCS makeup and cooling. Therefore, the NRC staff concludes that the change is acceptable because DID is improved with respect to water makeup and RHR by remaining in Mode 3.

The NRC staff notes that as stated in the SE for NEDC-32988-A, the NRC staff's approval relies upon the primary containment and all other primary and secondary containment-related functions still being operable, including the SGT system, for maintaining DID while in Mode 3.

3.2.10 TS 3.6.4.3, "Standby Gas Treatment (SGT) System"

The function of the SGT system is to ensure that radioactive materials that leak from the primary containment into the secondary containment following a DBA are filtered and adsorbed prior to exhausting to the environment. The Unit 1 and Unit 2 SGT systems consist of a suction duct, two parallel and independent filter trains with associated blowers, valves and controls, and a discharge vent.

The SGT System automatically starts and operates in response to actuation signals indicative of conditions or an accident that could require operation of the system. Following an initiation signal, both SGT charcoal filter train fans start.

<u>Proposed Modifications for End State Required Actions</u>:

Current TS 3.6.4.3 Condition B states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two SGT subsystems inoperable in MODE 1, 2, or 3.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.6.4.3 Condition B would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A or B not met. <u>OR</u> Two SGT subsystems inoperable in MODE 1, 2, or 3.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------ B.1 Be in MODE 3. ~~AND~~ ~~B.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> The changes associated with Standard TS 3.6.4.3, Required Action D.1 are reflected in the Required Actions for BSEP TS 3.6.4.3 Condition B.
>
> Standard TS 3.6.4.3 Condition A applies to inoperability of one SGT subsystem. Standard TS 3.6.4.3 Condition D applies to inoperability of two SGT subsystems. The changes to the Standard TS 3.6.4.3 in TSTF-423 allows the unit to remain in Mode 3 under these conditions. BSEP TS 3.6.4.3 addresses inoperability of one SGT subsystem in Condition A. BSEP TS 3.6.4.3 Condition B provides the shutdown requirements for failure to meet the Completion Time of Condition A and for inoperability of two SGT subsystems. As such, only BSEP TS 3.6.4.3 Condition B is revised to provide equivalent changes to those in TSTF-423 for Standard TS 3.6.4.3.

NRC Staff Assessment:

The NRC staff has reviewed the licensee's variation regarding TS differences between the BSEP SGT system and the SGT system described in the TSTF-423 SE, and determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

The unavailability of one or both SGT subsystems has no impact on CDF or LERF, independent of the mode of operation at the time of the accident. Furthermore, the challenge frequency of the SGT system (i.e., the frequency with which the system is expected to be challenged to mitigate offsite radiation releases resulting from materials that leak from the primary to the secondary containment above TS limits) is less than 1.0E-6/year (yr). Consequently, the conditional probability that this system will be challenged during the repair time interval, while the plant is at either the current or the proposed end state (i.e., Mode 4 or Mode 3, respectively) is less than 1.0E-8/yr. This probability is considerably smaller than the probabilities considered negligible in RG 1.177 for much higher consequence risks such as large early release.

The results described in NEDC-32988-A, and as evaluated by the NRC staff in the associated SE, summarize the NRC staff's risk argument for approval of TS LCO 3.6.4.3, "Standby Gas Treatment (SGT) System." The argument for staying in Mode 3 instead of going to Mode 4 to repair the SGT system (one or both trains) is also supported by DID considerations. The NRC staff's evaluation makes a comparison between the current (Mode 4) and proposed (Mode 3) end state with respect to the means available to perform critical functions (i.e., functions contributing to the DID philosophy) whose success is needed to prevent core damage and containment failure and mitigate radiation releases. The risk and DID arguments used according to the integrated decisionmaking process of RG 1.174 and RG 1.177 support the conclusion that Mode 3 is as safe as Mode 4 for repairing an inoperable SGT system; therefore, the NRC staff concludes that the change is acceptable.

3.2.11 TS 3.7.1, "Residual Heat Removal Service Water (RHRSW) System"

The RHRSW system is designed to provide cooling water for the RHR system heat exchangers required for a safe reactor shutdown following a DBA or transient. The RHRSW system is operated whenever the RHR heat exchangers are required to operate in the shutdown cooling mode or in the suppression pool cooling or spray mode of the RHR system.

Proposed Modifications for End State Required Actions and Completion Times:

- New TS 3.7.1 Condition C is added as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition C not met.	C.1 ----------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 3. ---------------------------- Be in MODE 3	12 hours

- Current TS 3.7.1 Condition C states as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Both RHRSW subsystems inoperable	C.1------------N0TE--------- 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

Revised TS 3.6.4.3 Condition C renumbered as new Condition D, would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C~~D. Both RHRSW subsystems inoperable.	~~C~~D.1------------N0TE--------- 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

- Current TS 3.7.1 Condition D states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3 AND D.2 Be in MODE 4	12 hours 36 hours

Revised TS 3.7.1 Condition D <u>renumbered as Condition E,</u> would state:

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~D~~E. Required Action and associated Completion Time of Condition C not met.	~~D~~E.1 Be in MODE 3 AND ~~D~~E.2 Be in MODE 4	12 hours 36 hours

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> The addition of the new Condition D in Standard 3.7.1 proposed as a new Condition C in BSEP TS3.7.1. Conditions in BSEP TS 3.7.1 are numbered differently from the Standard TS 3.7.1 Conditions.
>
> Both the BSEP and the Standard TS 3.7.1 Condition A addresses inoperability of one RHRSW pump. Standard TS 3.7.1 Condition B addresses inoperability of one RHRSW pump in each subsystem. Standard TS 3.7.1 Condition C addresses inoperability of a RHRSW for reasons other than Condition A. BSEP TS 3.7.1 does not have a Condition equivalent to Standard TS 3.7.1 Condition B. Rather, BSEP TS 3.7.1 Condition B addresses inoperability of a RHRSW for reasons other than Condition A (i.e., which would include inoperability of one RHRSW pump in each subsystem). As such, adding the new BSEP TS 3.7.1 Condition C provides an equivalent change to that in TSTF 423 for Standard TS 3.7.1.

<u>NRC Staff Assessment:</u>

The NRC staff has reviewed the licensee's variation to the approved TSTF-423 and determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

BWROG performed a comparative PRA evaluation of the core damage risks when operating in the current end state versus the proposed Mode 3 end state. The results indicated that the core damage risks while operating in Mode 3 (assuming the individual failure conditions) are lower or comparable to the current end state. By remaining in Mode 3, HPCI, RCIC, and the power conversion system (condensate/feedwater) remain available for water makeup and decay heat removal. Additionally, the EOPs direct the operators to take control of the depressurization function if low pressure injection/spray are needed for RCS makeup and cooling. Therefore, DID is improved with respect to water makeup and decay heat removal by remaining in Mode 3, and the required safety function can still be performed with the RHRSW subsystem components that are still operable; therefore, the NRC staff concludes that the change is acceptable.

3.2.12 TS 3.7.2, "Service Water (SW) System and Ultimate Heat Sink (UHS)"

Per the application, the licensee does not propose any change to TS 3.7.2.

The NRC staff reviewed the licensee's proposed variation and finds it acceptable since the variation does not affect the staff's justification for the licensee's proposed adoption of TSTF-423.

3.2.13 TS 3.7.3, "Control Room Emergency Ventilation (CREV) System"

BSEP's CREV System provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The safety related function of the CREV System is the radiation protection portion of the radiation/smoke protection mode and includes two redundant high efficiency air filtration subsystems for emergency treatment of recirculated air or outside supply air and a control room envelope boundary that limits the inleakage of unfiltered air. Each CREV subsystem consists of a high efficiency particulate air filter, an activated charcoal adsorber bank, an emergency recirculation fan, and the associated ductwork, valves or dampers, doors, barriers, and instrumentation.

<u>Proposed Modifications for End State Required Actions:</u>

Current TS 3.7.3 Condition C states as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.in MODE 1,2,or 3. OR Two CREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.7.3 Condition C would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.in MODE 1,2,or 3. OR Two CREV subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------ C.1 Be in MODE 3. ~~AND~~ ~~C.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> BSEP TS 3.7.3 corresponds to Standard TS 3.7.4. The changes associated with Standard TS 3.7.4, Required Action E.1 and E.2 are reflected in the Required Actions for BSEP TS 3.7.3 Condition C.
>
> Standard TS 3.7.4 Condition A applies to inoperability of one Main Control Room Environmental Control (MCREC) subsystem. Standard TS 3.7.4 Condition E applies to inoperability of two MCREC subsystems. The changes to the Standard TS 3.7.4 in TSTF-423 allow the unit to remain in Mode 3 under these conditions. BSEP TS 3.7.3 addresses inoperability of one CREV subsystem (i.e., plant specific nomenclature corresponding to MCREC) in Condition A. BSEP TS 3.7.3 Condition C provides the shutdown requirements for failure to meet the Completion Time of Condition A, Condition B, and for inoperability of two CREV subsystems. As such, only BSEP TS 3.7.3 Condition C is revised to provide equivalent changes to those in TSTF-423 for Standard TS 3.7.4.

<u>NRC Staff Assessment</u>:

The NRC staff has reviewed the licensee's variation regarding TS differences between the BSEP CREV system and the MCREC system described in the TSTF-423 SE, and determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

The unavailability of one or both CREV subsystems has no significant impact on CDF or LERF, irrespective of the mode of operation at the time of the accident. Additionally, the challenge frequency of the CREV system (i.e., the frequency with which the system is expected to be challenged to maintain a dose of less than 5 rem in the main control room following a DBA with radiation leaking from the containment) is less than 1.0E-6/yr. The challenge frequency will ultimately adjust the plant risk to a higher value for a specified period of time during the repair time interval. The change in plant risk can be quantified for this specific 7-day interval and produce a conditional event probability. The conditional event probability that the CREV system will be challenged during the repair time interval while the plant is in Mode 4, or in the proposed

Mode 3, is less than 1.0E-8. This probability is considerably smaller than probabilities considered "negligible" in RG 1.177 for much higher consequence risks, such as large early release.

The NRC SE for TR NEDC-32988, Revision 2, summarizes the NRC staff's risk argument for approval of TS 4.5.1.16, and LCO 3.7.4, "Main Control Room Environmental Control (MCREC) System" (BWR-4 only) (MCREC is similar to BSEP's CREV System). The argument for staying in Mode 3 instead of going to Mode 4 to repair the MCREC system (one or both trains) is also supported by DID considerations. Section 5.2 of Reference 6 makes a comparison between the Mode 3 and Mode 4 end state with respect to the means available to perform critical functions (i.e., functions contributing to the DID philosophy) whose success is needed to prevent core damage and containment failure and mitigate radiation releases. The risk and DID arguments used according to the integrated decisionmaking process of RG 1.174 and RG 1.177 support the conclusion that Mode 3 is as safe as Mode 4 for repairing an inoperable CREV system. Based on the above, the NRC staff concludes that the change is acceptable.

3.2.14 TS 3.7.4, "Control Room Air Conditioning (AC) System"

BSEP's Control Room AC portion of the Control Building Heating, Ventilation, and Air Conditioning System (hereinafter referred to as the Control Room AC System) provides temperature and humidity control for the control room during normal and accident conditions. The Control Room AC System consists of three 50-percent capacity subsystems that provide cooling of recirculated control room air and outside air. Each manually controlled subsystem consists of a heating coil, a cooling coil, a supply fan, a compressor-condenser unit, ductwork, dampers, and instrumentation and controls to provide for control room temperature control.

<u>Proposed Modifications for End State Required Actions</u>:

- Current TS 3.7.4 Condition C states as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.in MODE 1, 2, or 3.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.7.4 Condition C would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.in MODE 1, 2 ,or 3.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------- C.1 Be in MODE 3. ~~AND~~ ~~C.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

- Current TS 3.7.4 Condition E states as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Three control room AC subsystems inoperable in MODE 1, 2, or 3.	E.1 Enter LCO 3.0.3	12 hours 36 hours

Revised TS 3.7.4 Condition C would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Three control room AC subsystems inoperable in MODE 1, 2, or 3	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. -------------------------------- ~~E.1 Enter LCO 3.0.3~~ E.1 Be in MODE 3.	 12 hours ~~36 hours~~

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> BSEP TS 3.7.4 corresponds to Standard TS 3.7.5. BSEP TS 3.7.4 is revised to allow the units to remain in Mode 3 when three subsystems of the Control Room AC system are inoperable. Conditions in BSEP TS 3.7.4 are numbered differently from the Standard TS Conditions.
>
> Standard TS 3.7.5 applies to a typical Control Room AC system which consists of two independent, redundant subsystems. The BSEP Control Room AC system consists of three 50 percent capacity subsystems and BSEP TS 3.7.4 reflects this design. The justification provided in the topical report and model Safety Evaluation for changes to Standard TS 3.7.5 allows a unit to remain in Mode 3 when both subsystems of the Control Room AC system are inoperable. The proposed changes to BSEP TS 3.7.4 remain consistent with TSTF-423 by allowing the units to remain in Mode 3 under the loss of function condition.

<u>NRC Staff Assessment</u>:

The NRC staff's review of the licensee's variation regarding TS differences between the BSEP AC system versus that assessed in the NRC staff's SE for NEDC-32988-A for AC, determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

The unavailability of one or more AC subsystems has no significant impact on CDF or LERF, irrespective of the mode of operation at the time of the accident. Additionally, the challenge frequency of the AC system (i.e., the frequency with which the system is expected to be challenged to provide temperature control for the control room following control room isolation after a DBA that leads to core damage) is less than 1.0E-6/yr. The challenge frequency will ultimately adjust the plant risk to a higher value for a specified period of time during the repair time interval. The change in plant risk can be quantified for this specific 7-day interval and produce a conditional event probability. The conditional event probability that the AC subsystem will be challenged during the repair time interval while the plant is in Mode 4, or in the proposed Mode 3, is less than 1.0E-8. This probability is considerably smaller than probabilities considered "negligible" in RG 1.177 for much higher consequence risks, such as large early release.

The NRC staff's SE of TR NEDC-32988 summarizes its risk basis for approval of LCO 3.7.4, "Control Room Air Conditioning (CRAC) System." The NRC staff determined that the CRAC system is similar to the BSEP AC system. The basis for staying in Mode 3 instead of going to Mode 4 to repair the CRAC system (one or both trains) is supported by DID considerations. Section 6.2 of the NRC staff's SE for NEDC 32988-A, makes a comparison between the Mode 3 and Mode 4 end states with respect to the means available to perform critical functions (i.e., functions contributing to the DID philosophy) whose success is needed to prevent core damage and containment failure and to mitigate radiation releases. The risk and DID arguments used according to the integrated decisionmaking process of RG 1.174 and RG 1.177 support the conclusion that Mode 3 is as safe as Mode 4 for repairing an inoperable control room AC system. The time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. Therefore, the NRC staff concludes that the change is acceptable.

3.2.15 TS 3.7.5, "Main Condenser Offgas"

During unit operation, steam from the low pressure turbine is exhausted directly into the main condenser. Air and noncondensible gases are collected in the main condenser, then exhausted through the steam jet air ejectors (SJAEs) to the Main Condenser Offgas System. The offgas from the main condenser normally includes radioactive gases.

The Main Condenser Offgas System for the purposes of this specification consists of the components in the following flow path from the main condenser SJAEs to the plant stack. Offgas is discharged from the main condenser via the SJAEs and diluted with steam to keep hydrogen levels below explosive concentrations. The offgas is then passed through an Offgas Recombiner System where hydrogen and oxygen are catalytically recombined into water. After recombination, the offgas is routed to an offgas condenser to remove moisture. The offgas then passes through a 30-minute delay before entering the Augmented Offgas Charcoal Adsorber System.

<u>Proposed Modifications for End State Required Actions</u>:

- Current TS 3.7.5 Condition B states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met..	B.1 Isolate all main steam lines.	12 hours
	<u>OR</u>	
	B.2 Isolate SJAE	12 hours
	<u>OR</u>	
	B.3.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.3.2 Be in Mode 4	36 hours

Revised TS 3.7.4 Condition B would state as follows:

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time not met.	----------NOTE----- LCO 3.0.4.a is not applicable when entering MODE 3. -------------------		
	B.1 Isolate all main steam lines.		12 hours
	<u>OR</u>		
	B.2 Isolate SJAE		12 hours
	<u>OR</u>		
	B.3.1 Be in MODE 3.		12 hours
	~~AND~~		
	~~B.3.2 Be in Mode 4.~~		~~36 hours~~

NRC Staff Assessment:

The failure to maintain the gross gamma activity rate of the noble gases in the main condenser offgas system within limits has no significant impact on CDF or LERF, irrespective of the mode of operation at the time of the accident. Additionally, the challenge frequency of the main condenser offgas system (i.e., the frequency with which the system is expected to be challenged to mitigate offsite radiation releases following a DBA) is less than 1.0E-6/yr. The challenge frequency will ultimately adjust the plant risk to a higher value for a specified period of time during the repair time interval. The change in plant risk can be quantified for this specific 7-day interval and produce a conditional event probability. The conditional event probability that the offgas system will be challenged during the repair time interval while the plant is in Mode 4, or in the proposed Mode 3, is less than 1.0E-8. This probability is considerably smaller than probabilities considered "negligible" in RG 1.177 for much higher consequence risks, such as large early release.

The NRC staff's SE of NEDC-32988-A summarizes the NRC staff's risk argument for approval of TS 4.5.1.18 and LCO 3.7.5, "Main Condenser Offgas." The argument for staying in Mode 3 instead of going to Mode 4 to repair the main condenser offgas system (one or both trains) is also supported by DID considerations. Section 5.2 of Reference 6 makes a comparison between the Mode 3 and Mode 4 end state with respect to the means available to perform critical functions (i.e., functions contributing to the DID philosophy) whose success is needed to prevent core damage and containment failure and mitigate radiation releases. The risk and DID arguments used according to the integrated decisionmaking process of RG 1.174 and RG 1.177 support the conclusion that Mode 3 is as safe as Mode 4 for repairing an inoperable main condenser offgas system. Therefore, the NRC staff concludes that the change is acceptable.

3.2.16 TS 3.8.1, "AC [Alternating Current] Sources - Operating"

BSEP Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred and alternate power sources), and the onsite standby power sources (diesel generators (DGs) 1, 2, 3, and 4. Per the Updated Final Safety Analysis Report (UFSAR), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature systems.

The Class 1E AC distribution system is divided into redundant load groups, so loss of any one group does not prevent the minimum safety functions from being performed. Each load group has access to two offsite power supplies (one preferred and one alternate) via a balance of plant (BOP) circuit path. This BOP circuit path consists of the BOP bus and the associated circuit path (master/slave breakers and interconnecting cables) to a 4.16 kilovolt (kV) emergency bus. Each load group can also be connected to a single DG.

Offsite power is supplied to the 230 kV switchyards from the transmission network by eight transmission lines. From the 230 kV switchyards, two qualified electrically and physically separated circuits provide AC power, through either a startup auxiliary transformer or backfeeding via a unit auxiliary transformer, to 4.16 kV BOP buses.

Proposed Modifications for End State Required Actions:

Current TS 3.8.1 Condition H states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F or G not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.8.1 Condition H would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. Required Action and associated Completion Time of Condition A, B, C, D, E, F or G not met.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------ H.1 Be in MODE 3. ~~AND~~ ~~H.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> Condition H of BSEP TS 3.8.1 is proposed to be revised per TSTF-423. As a result, the TSTF-423 changes will be applied to BSEP TS 3.8.1, Conditions A and B, which are plant specific and not included in Standard TS 3.8.1.
>
> Conditions in BSEP TS 3.8.1 are numbered differently from the Standard TS Conditions.

The application further states:

> Standard TS 3.8.1 applies to typical AC source design. BSEP TS 3.8.1 reflects the unique BSEP AC source design and, as a result, requires two Unit 1 and two Unit 2 qualified circuits and four separate and independent diesel generators to be operable when in Modes 1, 2, or 3. To accommodate maintenance activities, BSEP TS 3.8.1, Conditions A and B, are specific to AC sources primarily associated with the opposite unit (e.g., Conditions A and B of BSEP Unit 1 TS 3.8.1 are applicable to offsite circuits and diesel generators primarily associated with Unit 2). The proposed changes to BSEP TS 3.8.1 remain consistent with TSTF-423 in that an affected unit will be allowed to remain in Mode 3 given similar level degradation of AC sources. The justification provided in the topical report and model Safety Evaluation for changes to Standard TS 3.8.1 is applicable to BSEP.

NRC Staff Assessment:

The NRC staff's review of the licensee's variation regarding system functional differences between the BSEP AC sources versus that assessed in the staff's SE for NEDC-32988 for the same system, determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

Entry into any of the Conditions for the AC power sources implies that the AC power sources have been degraded, and the single failure protection for the safe shutdown equipment may be ineffective. Consequently, as specified in TS 3.8.1 at present, the plant operators must bring the plant to Mode 4 when the Required Action is not completed by the specified time for the associated action.

NEDC-32988-A provides a comparative PRA evaluation of the core damage risks of operation in the current end state and in the Mode 3 end state. Events initiated by the loss of offsite power are dominant contributors to CDF in most BWR PRAs, and the steam-driven core cooling systems (RCIC and HPCI) play a major role in mitigating these events. The evaluation indicates that the core damage risks are lower in Mode 3 than in Mode 4 for one inoperable AC power source. Going to Mode 4 for one inoperable AC power source would cause loss of the high pressure steam-driven injection system (RCIC/HPCI) and loss of the power conversion system (condenser/feedwater) and require activating the RHR system. In addition, EOPs direct the operator to take control of the depressurization function if low pressure injection/spray systems are needed for RPV water makeup and cooling.

Based on the low probability of loss of the AC power and the number of steam-driven systems available in Mode 3, the NRC staff determined that the risks of staying in Mode 3 are lower than going to Mode 4 end state. Therefore, the NRC staff concludes that the change is acceptable.

3.2.17 TS 3.8.4, "DC [Direct Current] Sources - Operating"

BSEP's DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment. Also, these DC subsystems provide a source of uninterruptible power to AC vital buses. As required by design bases in UFSAR Section 8.3.2.1.1, the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Safety Guide 6.

The DC power sources provide both motive and control power to selected safety related equipment, as well as power for circuit breaker control, relay operation, plant annunciation, and emergency lighting. There are two independent divisions per unit, designated Division I and Division II. Each division consists of a 250 Volt DC (VDC) battery center tapped to form two 125 VDC batteries. Each 125 VDC battery has an associated full capacity battery charger. The chargers are supplied from the same AC load groups for which the associated DC subsystem supplies the control power.

Proposed Modifications for End State Required Actions and Completion Times:

- Current TS 3.8.4 Condition B states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR Two or more DC electrical power subsystems inoperable	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.8.1 Condition B would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR Two or more DC electrical power subsystems inoperable	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ------------------------------ B.1 Be in MODE 3. ~~AND~~ ~~B.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

- As explained in the variation below, the licensee relocates the following existing Condition B into a new Condition C since the TSTF does not apply to this part of Condition B:

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Two or more DC electrical power subsystems inoperable.	C.1 Be in MODE 3 AND C.2 Be in MODE 4	12 hours 36 hours

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

"The changes associated with Standard TS 3.8.4, Required Action D.1 and D.2 are reflected in the Required Actions for BSEP TS 3.8.4 Condition B. The

> existing BSEP TS 3.8.4 Condition B addresses the failure to complete Condition A within the allowed Completion Time and inoperability of more than one DC electrical power subsystem. This Condition has been revised to address only the failure to complete Condition A within the allowed Completion Time. A new Condition C addresses inoperability of more than one DC electrical power subsystem. The changes associated with Standard TS 3.8.4 are not applicable to the new BSEP TS 3.8.4 Condition C."

The licensee further stated:

> Standard TS 3.8.4 includes Conditions associated with battery chargers, discrete batteries, and DC electrical power subsystems. BSEP TS 3.8.4 is applicable only to the DC electrical power subsystem level.
>
> Standard TS 3.8.4 does not address inoperability of multiple DC electrical power subsystems but BSEP TS 3.8.4 does. Also, the Standard TS 3.8.4 reflects a typical configuration consisting of two DC electrical power subsystems. The BSEP configuration requires both the Unit 1 and Unit 2 DC electrical power subsystems to be operable with a unit in Modes 1, 2, or 3. Consistent with the TSTF-423 changes to Standard TS 3.8.4, the allowance to remain in Mode 3 with one inoperable DC electrical power subsystem is applied to the revised BSEP TS 3.8.4 Condition B. Under both the Standard TS 3.8.4 configuration and the BSEP configuration, loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed. Therefore, the justification provided in the topical report and model Safety Evaluation for changes to Standard TS 3.8.4 is applicable to BSEP.

<u>NRC Staff Assessment:</u>

The NRC staff's review of the licensee's variation regarding system functional differences between the BSEP DC sources system versus that assessed in the NRC staff's SE for the same system in NEDC-32988, Revision 2, determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

If one of the DC electrical power subsystems is inoperable, the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. BWROG did a comparative PRA evaluation in NEDC-32988 of the core damage risks of operation in the current end state and in the proposed Mode 3 end state. Events initiated by the loss of offsite power are dominant contributors to CDF in most BWR PRAs, and the steam driven core cooling systems, RCIC, and HPCI play a major role in mitigating these events. The evaluation indicates that the core damage risks are lower in Mode 3 than in Mode 4. Going to Mode 4 for one inoperable DC power source would cause loss of the high pressure steam-driven injection system (RCIC and HPCI) and loss of the power conversion system condenser/feedwater) and require activating the RHR system. In addition, the EOPs direct the operator to take control of the depressurization function if low pressure injection/spray systems are needed for RPV water makeup and cooling. Based on the low probability of loss of the DC power and the number of systems available in Mode 3, the NRC staff determined that the risks of staying in Mode 3 are approximately the same as, and in some cases lower than, the risks of going to Mode 4 end state. Therefore, the NRC staff concludes that the change is acceptable.

3.2.17 TS 3.8.7, "Distribution Systems - Operating"

The onsite Class 1E AC and DC electrical power distribution system is divided into redundant and independent AC and DC electrical power distribution subsystems.

Each primary emergency bus (4.16 kV emergency bus) has access to two offsite sources of power via a common circuit path from its associated upstream BOP bus (master/slave breakers and interconnecting cables). In addition, each 4.16 kV emergency bus can be provided power from an onsite DG source. The upstream BOP bus associated with each 4.16 kV emergency bus is normally connected to the main generator output via the unit auxiliary transformer.

Proposed Modifications for End State Required Actions:

Current TS 3.8.7 Condition E states:

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	12 hours 36 hours

Revised TS 3.8.1 Condition E would state as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met.	----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------------------------- E.1 Be in MODE 3. ~~AND~~ ~~E.2 Be in MODE 4.~~	 12 hours ~~36 hours~~

Regarding a variation from TSTF-423-A, Revision 1, or the STSs, the licensee stated:

> BSEP TS 3.8.7 corresponds System to Standard TS 3.8.9 Condition D of BSEP TS 3.8.7 is proposed to be revised per TSTF-423. As a result, the TSTF-423 changes will be applied to BSEP TS 3.8.7, Condition A which is plant specific and not included in Standard TS 3.8.9. Conditions in BSEP TS 3.8.7 are numbered differently from the Standard TS 3.8.9 Conditions.
>
> Standard TS 3.8.9 applies to typical Distribution system design. BSEP TS 3.8.7 reflects the unique BSEP Distribution system design and, as a result, requires emergency bus 1 (i.e., E1), E2, E3, and E4 load groups to be operable when the unit is in Modes 1, 2, or 3. Load groups E1 and E2 primarily serve Unit 1 loads and load groups E3 and E4 load groups primarily serve Unit 2 loads.

To accommodate maintenance activities, BSEP TS 3.8.7, Condition A, is specific to load groups primarily associated with the opposite unit (e.g., Condition A of BSEP Unit 1 TS 3.8.7 is applicable to Load Groups 3 and 4, primarily associated with Unit 2). The proposed changes to BSEP TS 3.8.7 remain consistent with TSTF-423 in that an affected unit will be allowed to remain in Mode 3 given similar level degradation. The justification provided in the topical report and model Safety Evaluation for changes to Standard TS 3.8.9 is applicable to BSEP.

NRC Staff Assessment:

The NRC staff's review of the licensee's variation regarding system functional differences between the BSEP distribution systems versus that assessed in the NRC staff's SE for Improved Technical Specifications distribution systems in NEDC 32988, Revision 2, determined that the differentiation does not invalidate the applicability of the TSTF-423 changes.

If one of the AC/DC/AC vital subsystems is inoperable, the remaining AC/DC/AC vital subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. NEDC-32988, Revision 2, did a comparative PRA evaluation of the core damage risks of operation in the current end state and in the Mode 3 end state with one of the AC/DC/AC vital subsystems inoperable. Events initiated by the loss of offsite power are dominant contributors to CDF in most BWR PRAs, and the steam-driven core cooling systems (RCIC and HPCI) play a major role in mitigating these events. The evaluation indicates that the core damage risks are lower in Mode 3 than in Mode 4. Going to Mode 4 for one inoperable AC/DC/AC vital subsystem would cause loss of the high pressure steam-driven injection system (RCIC/HPCI) and loss of the power conversion system (condenser/feedwater) and require activating the RHR system. In addition, EOPs direct the operator to take control of the depressurization function if low pressure injection/spray systems are needed for RPV water makeup and cooling.

Based on the low probability of loss of the AC/DC/AC vital electrical subsystems during the infrequent and limited time in Mode 3 and the number of systems available in Mode 3, the NRC staff determined that the risks of staying in Mode 3 are approximately the same as, and in some cases lower than, the risks of going to Mode 4 end state. Therefore, the NRC staff concludes that the change is acceptable.

3.3 Regulatory Commitments

Duke Energy's supplement letter, dated March 25, 2017 (Reference 2), lists the following regulatory commitments:

REGULATORY COMMITMENTS	DUE DATE/EVENT
Duke Energy will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision 4A, April 2011.	Ongoing.
Duke Energy will follow the guidance established in TSTF-IG-05-02, Revision 2, "Implementation Guidance for TSTF-423, Revision 1, 'Technical Specifications End States, NEDC-32988-A,'" with the exception the Duke Energy will follow Regulatory Guide (RG) 1.160 in lieu of RG 1.182, and Duke Energy will follow Revision 4A of NUMARC 93-01 in lieu of Revision 3 of NUMARC 93-01.	To be implemented with amendments.

The NRC staff concludes that reasonable controls for the implementation and subsequent evaluation of proposed changes pertaining to the above regulatory commitments are best provided by the licensee's administrative processes, including its commitment management program.

3.4 Summary

Because the time spent in Mode 3 to perform repairs on any of the systems described above would be infrequent and limited, and in light of the DID considerations (discussed above and in NEDC-32988-A, and as evaluated in the NRC staff's SE for NEDC-32988), the NRC staff concludes that the proposed changes to the BSEP Unit Nos. 1 and 2 TSs are acceptable and the requirements of the 10 CFR 50.36 continue to be met.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendments on July 18, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments would change requirements with respect to installation or use of a facility located within the restriction 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 that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (81 FR 87968, December 6, 2016). 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 is needed to be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by 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.

7.0 REFERENCES

1. Duke Energy Progress, LLC (Duke Energy) letter to NRC, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2 - License Amendment Request for Adoption of TSTF-423, Revision 1, 'Technical Specification End States, NEDC-2988-A,'" dated September 28, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16287A415).

2. Duke Energy letter to NRC, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2 - Response to Request for Additional Information, License Amendment Request for Adoption of TSTF-423, Revision 1, 'Technical Specification End States, NEDC-32988-A,'" dated March 25, 2017 (ADAMS Accession No. ML17086A006).

3. Duke Energy letter to NRC, "Brunswick Steam Electric Plant, Unit Nos. 1 and 2 – Clarification of Responses to Requests for Additional Information, License Amendment Request for Adoption of TSTF-423, Revision 1, 'Technical Specification End States, NEDC-32988-A,'" dated May 25, 2017 (ADAMS Accession No. ML17145A103).

4. Technical Specification Task Force (TSTF) traveler TSTF-423-A, Revision 1, "Technical Specifications End States, NEDC-32988-A," dated December 22, 2009 (ADAMS Accession No. ML093570241).

5. Federal Register, Vol. 58, No. 139, p. 39136, "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Plants," dated July 22, 1993.

6. BWR Owners Group, NEDC-32988-A, Revision 2, "Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants," December 2002 (ADAMS Accession No. ML030170084).

7. NRC, Safety Evaluation of Topical Report NEDC-32988, Revision 2, "Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants," dated September 27, 2002 (ADAMS Accession No. ML022700603).

8. NRC, NUREG-1433, Revision 4.0, "Standard Technical Specifications – General Electric BWR/4 Plants," April 2012 (ADAMS Accession No. ML12104A192).

9. NRC, NUREG-1434, Revision 4.0, "Standard Technical Specifications - General Electric BWR/6 Plants," April 2012 (ADAMS Accession No. ML12104A195)

10. Federal Register, Vol. 76, No. 34, p. 9614, "Notice of Availability of the Proposed Models for Plant-Specific Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-423, Revision 1, 'Technical Specification End States, NEDC-32988-A,'" for Boiling Water Reactor Plants Using the Consolidated Line Item Improvement Process," dated February 18, 2011.

11. NRC, "Model Application and Model Safety Evaluation for Technical Specification End States, NEDC-32988-A," dated February 2, 2011 (ADAMS Accession No. ML102730688).

12. NRC, RG 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," May 2000 (ADAMS Accession No. ML003699426).

13. NRC, RG 1.160, Revision 3, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," May 2012 (ADAMS Accession No. ML113610098).

14. NRC, NUMARC 93-01, Revision 4A, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," April 2011 (ADAMS Accession No. ML11116A198).

15. NRC, RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," July 1998 (ADAMS Accession No. ML003740133).

16. NRC, Regulatory Guide 1.177, "An Approach for Plant Specific, Risk-Informed Decisionmaking: Technical Specifications," August 1998 (ADAMS Accession No. ML003740176).

17. Nuclear Management and Resource Council, NUMARC 93-01, Revision 3, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," July 2000 (ADAMS Accession No. ML031500684).

18. BWR Owners Group, "TSTF-IG-05-02, Implementation Guidance for TSTF-423, Revision 0, 'Technical Specifications End States, NEDC-32988-A,'" September 2005 (ADAMS Accession No. ML052700156).

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Date: August 29, 2017

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS TO ADOPT TSTF-423 "TECHNICAL SPECIFICATIONS END STATES, NEDC-32988-A" (CAC NOS. MF8466 AND MF8467) DATED AUGUST 29, 2017

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