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January 23, 2018

10 CFR 50.90

Serial: BSEP 18-0012

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Application to Revise Technical Specifications to Adopt TSTF-208, Revision 0,
Extension of Time to Reach Mode 2 in LCO 3.0.3

Ladies and Gentlemen:

Pursuant to the provisions of the Code of Federal Regulations (CFR), Title 10, Part 50.90, Duke Energy Progress, LLC (Duke Energy), hereby requests a revision to the Technical Specifications (TS) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2.

The proposed amendment would revise the allowed time to reach Mode 2 in Limiting Condition for Operation (LCO) 3.0.3 based on the approved TSTF-208, Revision 0, *Extension of Time to Reach Mode 2 in LCO 3.0.3*. Specifically, the amendment proposes to extend the allowed time from 7 hours to 10 hours to reach Mode 2 in LCO 3.0.3.

Enclosure 1 provides an evaluation of the proposed TS change. Enclosures 2 and 3 provide the existing TS pages marked-up to show the proposed change for Units 1 and 2, respectively. Enclosures 4 and 5 provide revised (i.e., typed) TS pages for Units 1 and 2, respectively.

Approval of the proposed amendment is requested by January 31, 2019. Once approved, the amendment shall be implemented within 120 days.

This document contains no regulatory commitments.

In accordance with 10 CFR 50.91(b)(1), Duke Energy is notifying the State of North Carolina of this license amendment request by transmitting a copy of this letter and enclosure to the designated State Official.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager – Regulatory Affairs, at (910) 832-2487.

I declare under penalty of perjury that the foregoing is true and correct. Executed on
January 23, 2018.

Sincerely,



William R. Gideon

WRG/mkb

Enclosures:

1. Evaluation of the Proposed Change
2. Proposed Unit 1 BSEP TS (Markup)
3. Proposed Unit 2 BSEP TS (Markup)
4. Proposed Unit 1 BSEP TS (Retyped Pages)
5. Proposed Unit 2 BSEP TS (Retyped Pages)

cc (with enclosures):

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Evaluation of the Proposed Change

Subject: Application to Revise Technical Specifications to Adopt TSTF-208, Revision 0,
Extension of Time to Reach Mode 2 in LCO 3.0.3

1. Summary Description

Duke Energy Progress, LLC (Duke Energy), is requesting Nuclear Regulatory Commission (NRC) approval of the proposed revision to the Technical Specifications (TS) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The proposed amendment would revise the allowed time to reach Mode 2 in Limiting Condition for Operation (LCO) 3.0.3. Specifically, the TS change proposes to extend the allowed time to reach Mode 2 in LCO 3.0.3 from 7 hours to 10 hours.

2. Detailed Description

2.1. TSTF-208 and LCO 3.0.3 Bases

The TS Bases states LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met and either an associated Required Action and Completion Time is not met and no other Condition applies, or the condition of the unit is not specifically addressed by the associated Actions. This specification delineates the time limits for placing the unit in a safe mode or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its actions. LCO 3.0.3 allows one hour for the preparation of an orderly shutdown before initiating actions to place an affected unit in the appropriate Mode.

In accordance with TSTF-208, Revision 0, it has been determined that older Boiling Water Reactors (BWRs) can take longer than the available six hours to reach conditions where the plant can be placed in Mode 2. The intent of LCO 3.0.3 is to perform a controlled shutdown over that time period. This ensures that the unit shutdown would be completed in a prompt manner while not unduly increasing the likelihood of plant transients. However, experience at several older BWR plants has shown that six hours is not enough time to perform the intended controlled shutdown.

2.2. Current Technical Specifications Requirements

Current TS, per LCO 3.0.3 upon entry, requires the unit to be in Mode 2 within 7 hours; Mode 3 within 13 hours; and Mode 4 within 37 hours. Duke Energy, in accordance with TSTF-208, is requesting to amend the requirement to be in Mode 2 from 7 hours to 10 hours. This request does not change any of the other Mode time frame requirements contained in LCO 3.0.3.

2.3. Reason for the Proposed Change

At BSEP, it has been determined that approximately 9 hours are required to reach Mode 2 in a controlled manner (i.e., using only control rods). Assuming 1 hour is provided to initiate actions, this would result in 10 hours as being an appropriate time for reaching Mode 2 in LCO 3.0.3. This change will align the TS LCO requirements with the plant's operational capabilities by allowing more time to accommodate the controlled shutdown as intended and to avoid an

unnecessary plant shutdown when the conditions which resulted in an LCO 3.0.3 entry can be understood and corrected in a timely manner.

2.4. Description of the Proposed Change

The proposed amendment would revise the allowed time to reach Mode 2 in LCO 3.0.3 based on the approved TSTF-208, Revision 0, Extension of Time to Reach Mode 2 in LCO 3.0.3. Specifically, the amendment proposes to extend the allowed time from 7 hours to 10 hours to reach Mode 2 in LCO 3.0.3. This request does not change any of the other Mode time frame requirements contained in LCO 3.0.3.

Duke Energy will not propose any variations from the TS changes described in TSTF-208, Revision 0.

3. **Technical Evaluation**

NUREG-1433, Revision 4, BWR/4 STS requires actions to be initiated within 1 hour to place the unit in Mode 2 within 7 hours when in LCO 3.0.3. Therefore, the NUREG effectively allows 6 hours from the start of the shutdown to reach Mode 2. The intent of this NUREG action time is to require a controlled shutdown in an expeditious, yet orderly manner. This ensures a reactor shutdown is performed in a prompt manner while minimizing the risk of inadvertent transients that could result from undue time pressure. This is especially important since the plant, by being in LCO 3.0.3, is already in a degraded condition.

In accordance with TSTF-208, Revision 0, it has been determined that older BWRs can take longer than the currently available 6 hours to reach conditions where the plant can be placed in Mode 2. BSEP is a BWR/4 with 137 control rods. At BSEP, it has been determined that approximately 9 hours are required to reach Mode 2 in a controlled manner (i.e., using only control rods). Assuming 1 hour is provided to initiate actions, this would result in 10 hours as being an appropriate time for reaching Mode 2 in LCO 3.0.3. A review of historical data from recent refueling outage shutdowns indicates that approximately 8 hours is required to take one of the units from 100% power to 20% power, at which point a manual scram is initiated. This data, along with the experience of senior Operations staff and management indicates that approximately 9 hours are needed to perform this activity using only the control rods following the decision to shut down. The time to reach Mode 3 is unchanged by this TS proposal and remains at 13 hours.

4. **Regulatory Evaluation**

4.1. Applicable Regulatory Requirements/Criteria

The following NRC requirements and guidance documents are applicable to the proposed change.

The regulations of Title 10 of the Code of Federal Regulations (10 CFR) Part 50.36, *Technical specifications*, establish the requirements related to the content of the TS. Section 50.36(c)(2) states:

Limiting conditions for operation. 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.

The regulatory requirements in 10 CFR 50.36 are not specific regarding the actions to be followed when TS requirements are not met other than a plant shut down. The proposed change would modify the required timeframe for reaching Mode 2 after entering LCO 3.0.3. The requirements of LCO 3.0.3 establish the actions that must be implemented when an LCO is not met and either an associated Required Action and Completion Time is not met and no other Condition applies, or the condition of the unit is not specifically addressed by the associated Actions. This specification delineates the time limits for placing the unit in a safe mode or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its actions. The allowance is reasonable based on plant operating experience, the brief time period after entering Mode 2 until entering Mode 3, and considering the total time to be in Mode 3 of 13 hours in LCO 3.0.3 remains unchanged.

4.2. Precedent

The proposed change is consistent with NRC-approved license amendments issued to Tennessee Valley Authority on November 21, 2000 (i.e., Amendment Numbers 239/266/226) for Browns Ferry Units 1, 2, and 3 (i.e., ADAMS Accession No. ML003773700), as well as amendments issued to Exelon Nuclear on May 10, 2006 (i.e., Amendment Numbers 259/262) for Peach Bottom Units 1 and 2 (i.e., ADAMS Accession No. ML061070292). The approved TS changes are identical to the change proposed in this request. Moreover, both Browns Ferry and Peach Bottom are similar type (i.e., BWR/4) and vintage of reactor design to BSEP.

4.3. No Significant Hazards Consideration Determination

In accordance with 10 CFR 50.90, *Application for amendment of license, construction permit, or early site permit*, Duke Energy Progress, LLC (Duke Energy), requests an amendment to the Facility Operating License for Brunswick Steam Electric Plant (BSEP) to adopt TSTF-208, Revision 0, *Extension of time to reach Mode 2 in LCO 3.0.3*. The proposed amendment would revise the allowed time to reach Mode 2 in Limiting Condition for Operation (LCO) 3.0.3. Specifically, the TS change proposes to extend the allowed time to reach Mode 2 in LCO 3.0.3 from 7 hours to 10 hours.

The proposed change has been reviewed considering applicable requirements of 10 CFR 50.36; 10 CFR 50, Appendix A; and other applicable NRC documents. Duke Energy has evaluated the proposed change to extend the allowed time to reach Mode 2 in LCO 3.0.3 and determined that the change does not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three standards, set forth in 10 CFR 50.92, is provided below.

- 1) Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The time frame to take response action in accordance with LCO 3.0.3 is not an initiating condition for any accident previously evaluated. The proposed change does

not authorize the addition of any new plant equipment or systems, nor does it alter the assumptions of any accident analyses. The small increase in the time allowed to reach Mode 2 would not place the plant in any significantly increased probability of an accident occurring. The unit would already be preparing for a plant shutdown condition because of the 1 hour requirement to initiate shutdown actions. There is no change in the time period to reach Mode 3. The Mode 3 Condition is the point at which the plant reactor core is no longer critical (i.e., Hot Shutdown).

Therefore, since there is no change to the time period to reach the Hot Shutdown condition, the small change in the time to reach Mode 2 status does not involve a significant increase in the probability or consequences of an accident previously evaluated.

- 2) Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change to the allowed time to reach Mode 2 in LCO 3.0.3 does not require any modification to the plant or change equipment operation. The proposed change will not introduce failure modes that could result in a new accident, and the change does not alter assumptions made in the safety analysis. The proposed change will not alter the design configuration, or method of operation of plant equipment beyond its normal functional capabilities. The proposed change does not create any new credible failure mechanisms, malfunctions, or accident initiators.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from those that have been previously evaluated.

- 3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The proposed change to the allowed time to reach Mode 2 in LCO 3.0.3 does not alter or exceed a design basis or safety limit. There is no change being made to safety analysis assumptions or the safety limits that would adversely affect plant safety as a result of the proposed change. Margins of safety are unaffected by the proposed change and the applicable requirements of 10 CFR 50.36(c)(2)(ii) and 10 CFR 50, Appendix A will continue to be met.

Therefore, the proposed change does not involve any reduction in a margin of safety.

4.4. Conclusions

In conclusion, and based on the considerations discussed above, the proposed change does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified. Also, there is a reasonable assurance that the health and safety of the public will not be impacted by the proposed change to the allowed time to reach Mode 2 in LCO 3.0.3. The change will be in compliance with the NRC regulations, and the

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

5. Environmental Consideration

The proposed amendment would change a requirement with respect to installed facility components located within the restricted area of the plant as defined in 10 CFR Part 20. However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

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Proposed Unit 1 BSEP TS (Markups)

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2, LCO 3.0.7, LCO 3.0.8, and 3.0.9.

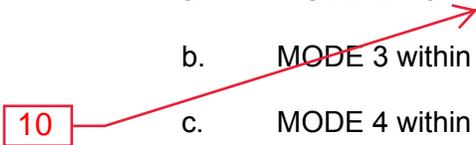
LCO 3.0.2 Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and LCO 3.0.6.

If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 2 within 7 hours;
- b. MODE 3 within 13 hours; and
- c. MODE 4 within 37 hours.

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Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1, 2, and 3.

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;

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Extension of Time to Reach Mode 2 in LCO 3.0.3

Proposed Unit 2 BSEP TS (Markups)

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2, LCO 3.0.7, LCO 3.0.8, and LCO 3.0.9.

LCO 3.0.2 Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and LCO 3.0.6.

If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 2 within 7 hours;
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Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1, 2, and 3.

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:

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Proposed Unit 1 BSEP TS (Retyped Pages)

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2, LCO 3.0.7, LCO 3.0.8, and 3.0.9.

LCO 3.0.2 Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and LCO 3.0.6.

If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 2 within 10 hours;
- b. MODE 3 within 13 hours; and
- c. MODE 4 within 37 hours.

Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1, 2, and 3.

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;

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Extension of Time to Reach Mode 2 in LCO 3.0.3

Proposed Unit 2 BSEP TS (Retyped Pages)

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2, LCO 3.0.7, LCO 3.0.8, and LCO 3.0.9.

LCO 3.0.2 Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5 and LCO 3.0.6.

If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 2 within 10 hours;
- b. MODE 3 within 13 hours; and
- c. MODE 4 within 37 hours.

Exceptions to this Specification are stated in the individual Specifications.

Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the actions required by LCO 3.0.3 is not required.

LCO 3.0.3 is only applicable in MODES 1, 2, and 3.

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;

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