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

November 26, 2017

Mr. William R. Gideon, 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 FOR TECHNICAL SPECIFICATION 3.8.1, "AC [ALTERNATING CURRENT] SOURCES – OPERATING" ONE-TIME EXTENSION OF EMERGENCY DIESEL GENERATOR COMPLETION TIMES AND SUSPENSION OF SURVEILLANCE REQUIREMENTS (**EMERGENCY SITUATION)** (EPID L-2017-LLA-0392)

Dear Mr. Gideon:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendments Nos. 282 and 310 to Renewed Facility Operating License Nos. DPR-71 and DPR-62 for Brunswick Steam Electric Plant (BSEP), Units 1 and 2, respectively. These amendments are in response to your license amendment request (LAR) dated November 22, 2017, as supplemented by a letter dated November 24, 2017.

The amendments revise the Technical Specifications (TSs) for a one-time extension of the emergency diesel generator (EDG) No. 4 completion time (CT) described in the TSs for BSEP Unit Nos. 1 and 2. Specifically, the emergency LAR would extend the TS 3.8.1, Required Action D.5, from 14 days to 30 days. A commensurate change would extend the maximum CT of Required Action D.5 associated with discovery of failure to meet Limiting Condition for Operation (LCO) 3.8.1.a or b (i.e., from 17 days to 33 days). In addition, the licensee has requested to suspend monthly testing of EDGs 1, 2, and 3 per Surveillance Requirement (SR) 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the proposed extended CTs, if applicable.

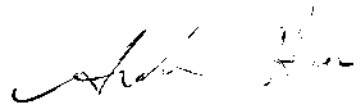
EDG 4 was removed from service, in support of planned maintenance, on November 13, 2017, at 0745 Eastern Standard Time (EST). The original scope of work included investigation into the cause of an increasing trend of aluminum in the diesel lubricating oil. The investigation determined that two main bearings were damaged, and a total of five main bearings were replaced to correct the condition. On November 19, 2017, the licensee identified an increase in the original work scope that will extend the EDG 4 maintenance outage beyond the current TS 3.8.1, Required Action D.5, CT of 0745 EST on November 27, 2017, at which time TS 3.8.1, Condition H would be entered requiring both units to be in Mode 3 within 12 hours. To avoid an unnecessary dual unit shutdown without a commensurate benefit in nuclear safety, the licensee requested that, on a one-time basis, the CT for TS 3.8.1, Required Action D.5, be extended from 14 days to 30 days. A commensurate change is also proposed to extend the maximum CT of Required Action D.5 associated with discovery of failure to meet LCO 3.8.1.a or b (i.e., from 17 days to 33 days). In addition, consistent with defense-in-depth philosophy, Duke Energy is

requesting to suspend monthly testing of EDGs 1, 2, and 3 per SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the proposed extended CTs, if applicable.

The license amendments are issued under the emergency provisions of paragraph 50.91(a)(5) of Title 10 of the *Code of Federal Regulations*, Part 50 due to the time critical nature of the amendments. In this instance, an emergency situation exists in that the proposed amendments are needed to allow the licensee to preclude a plant shutdown.

A copy of the related safety evaluation is also enclosed. The safety evaluation describes the emergency circumstances under which the amendments were issued and the final no significant hazards determination. A Notice of Issuance addressing the final no significant hazards determination and opportunity for a hearing associated with the emergency LAR will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,



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. 282 to DPR-71
2. Amendment No. 310 to DPR-62
3. Safety Evaluation

cc: Listserv

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

DUKE ENERGY PROGRESS, LLC

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 282
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 November 22, 2017, as supplemented by a letter dated November 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. 282, 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 November 27, 2017, at 0745 hour EST.

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: November 26, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 282

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following pages of Renewed Facility Operating License No. DPR-71 and Appendix B 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 |
|---|---|
| 6 | 6 |
| 10 | 10 |

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 |
|---|---|
| 3.8-5 | 3.8-5 |
| --- | 3.8-5a |
| 3.8-7 | 3.8-7 |
| 3.8-8 | 3.8-8 |
| 3.8-9 | 3.8-9 |

Replace the following pages of the Appendix B Additional Conditions 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 |
|---|---|
| B-2 | B-2 |
| -- | B-3 |
| -- | B-4 |

(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 180$^{th}$ 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. 282, 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

3. Additional Conditions

The Additional Conditions contained in Appendix B, as revised through Amendment No. 282, are hereby incorporated into this license. Duke Energy Progress, LLC shall operate the facility in accordance with the Additional Conditions.

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

J. E. Dyer, Director
Office of Nuclear Reactor Regulation

Attachments:
1. Unit 1 – Technical Specifications – Appendices A and B

Date of Issuance: June 26, 2006

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. (continued) | D.5 Restore DG to OPERABLE status. | ---------NOTE---------<br>Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, the 14 day and 17 day Completion Times are extended to 30 days and 33 days, respectively.<br>----------<br><br>7 days from discovery of unavailability of SUPP-DG<br><br>AND<br><br>24 hours from discovery of Condition D entry ≥ 6 days concurrent with unavailability of SUPP-DG<br><br>AND<br><br>14 days<br><br>AND<br><br>17 days from discovery of failure to meet LCO 3.8.1.a or b |

(continued)

ACTIONS (continued)

| | | | |
|---|---|---|---|
| E. Two or more offsite circuits inoperable for reasons other than Condition B. | E.1 | Declare required feature(s) inoperable when the redundant required feature(s) are inoperable. | 12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s) |
| | AND | | |
| | E.2 | Restore all but one offsite circuit to OPERABLE status. | 24 hours |

(continued)

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.1 | Verify correct breaker alignment and indicated power availability for each offsite circuit. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.2 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.<br>3. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>4. Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.2 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify each DG starts from standby conditions and achieves steady state voltage ≥ 3750 V and ≤ 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.3 | ----------NOTES----------<br>1. DG loadings may include gradual loading.<br>2. Momentary transients outside the load range do not invalidate this test.<br>3. This Surveillance shall be conducted on only one DG at a time.<br>4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.<br>5. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>6. Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.3 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2800 kW and ≤ 3500 kW. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.4 | Verify each engine mounted tank contains ≥ 150 gal of fuel oil. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.5 | Check for and remove accumulated water from each engine mounted tank. | In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.8.1.6 | ----------NOTE----------<br>Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.6 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify the fuel oil transfer system operates to transfer fuel oil from the day fuel oil storage tank to the engine mounted tank. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.7 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>----------<br>Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3750 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3750 V and ≤ 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | In accordance with the Surveillance Frequency Control Program |

(continued)

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 262 | The fuel channel bow standard deviation component of the channel bow model uncertainty used by ANP-10307PA, *AREVA MCPR Safety Limit Methodology for Boiling Water Reactors* (i.e., TS 5.6.5.b.11) to determine the Safety Limit Minimum Critical Power Ratio shall be increased by the ratio of channel fluence gradient to the nearest channel fluence gradient bound of the channel measurement database, when applied to channels with fluence gradients outside the bounds of the measurement database from which the model uncertainty is determined. | Upon implementation of Amendment No. 262. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, Diesel Generators 1, 2, and 3 shall be protected. | Upon implementation of Amendment No. 282. |
| 282 | The SUPP-DG, FLEX diesel generators, station batteries, battery chargers, switchyard, and transformer yard shall be protected, as defense-in-depth, during the extended EDG Completion Times authorized by Amendment No. 282. | Upon implementation of Amendment No. 282. |
| 282 | Component testing or maintenance of safety systems in the off-site power systems and important non-safety equipment in the off-site power systems which can increase the likelihood of a plant transient or LOOP, as determined by plant management, will be avoided during the extended EDG Completion Times authorized by Amendment No. 282. | Upon implementation of Amendment No. 282. |
| 282 | Discretionary switchyard maintenance shall not be allowed during the extended EDG Completion Times authorized by Amendment No. 282. | Upon implementation of Amendment No. 282. |

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 282 | The High Pressure Coolant Injection (HPCI) pump, Reactor Core Isolation Cooling (RCIC) pump, and the Residual Heat Removal (RHR) pump associated with the operable EDGs will not be removed from service for elective maintenance activities during the extended EDG Completion Times authorized by Amendment No. 282. | Upon implementation of Amendment No. 282. |
| 282 | The system load dispatcher shall be contacted once per day to determine if any significant grid perturbations (i.e., high grid loading unable to withstand a single contingency of line or generation outage) are expected during the extended Completion Times authorized by Amendment No. 282. If significant grid perturbations are expected, station managers will assess the conditions and determine the best course for the plant. | Upon implementation of Amendment No. 282. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, weather conditions shall be monitored each shift to determine if forecasts are predicting severe weather conditions (e.g., thunderstorm or tornado warnings). If severe weather is expected, station managers will assess the conditions and determine the best course for the plant. | Upon implementation of Amendment No. 282. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, designated non-licensed operators (NLOs) shall be briefed, each shift, regarding cross tying the 4160 V emergency bus E2 to 4160 V emergency bus E4 per plant procedure 0AOP-36.1, *Loss of Any 4kV OR 480V Bus*. | Upon implementation of Amendment No. 282. |

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, designated NLOs will be briefed, each shift, regarding cross-tying 480 V E7 bus to the 480 V E8 bus per 0AOP-36.1, *Loss of Any 4kV OR 480V Bus*. | Upon implementation of Amendment No. 282. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, designated NLOs will be briefed, each shift, regarding starting and tying the SUPP-DG to 4160 V emergency bus E4 per plant procedure 0EOP-01-SBO-08, *Supplemental DG Alignment*. | Upon implementation of Amendment No. 282. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, designated NLOs will be briefed, each shift, regarding load shed procedures and alignment of the FLEX diesel generators. | Upon implementation of Amendment No. 282. |
| 282 | During the extended EDG Completion Times authorized by Amendment No. 282, a continuous fire watch shall be established for the Unit 1 Cable Spread Room and for the Balance of Plant busses in the Unit 1 Turbine Building 20 foot elevation. | Upon implementation of Amendment No. 282. |

**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. 310
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 November 22, 2017, as supplemented by a letter dated November 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. 310, 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 November 27, 2017, at 0745 hours EST.

FOR THE NUCLEAR REGULATORY COMMISSION

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: November 26, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 310

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

RENEWED FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace the following pages of Renewed Facility Operating License No. DPR-62 and Appendix B 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 |
|---|---|
| 6 | 6 |
| 10 | 10 |

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 |
|---|---|
| 3.8-5 | 3.8-5 |
| --- | 3.8-5a |
| 3.8-7 | 3.8-7 |
| 3.8-8 | 3.8-8 |
| 3.8-9 | 3.8-9 |

Replace the following pages of the Appendix B Additional Conditions 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 |
|---|---|
| B-2 | B-2 |
| -- | B-3 |
| -- | B-4 |

(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. 310, 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,

M. Mitigation Strategy License Condition

Develop and maintain strategies for addressing large fires and explosions and that include the following key areas:

(1) Fire fighting response strategy with the following elements:
1. Pre-defined coordinated fire response strategy and guidance
2. Assessment of mutual aid fire fighting assets
3. Designated staging areas for equipment and materials
4. Command and control
5. Training of response personnel

(2) Operations to mitigate fuel damage considering the following:
1. Protection and use of personnel assets
2. Communications
3. Minimizing fire spread
4. Procedures for implementing integrated fire response strategy
5. Identification of readily-available pre-staged equipment
6. Training on integrated fire response strategy
7. Spent fuel pool mitigation measures

(3) Actions to minimize release to include consideration of:
1. Water spray scrubbing
2. Dose to onsite responders

N. The licensee shall implement and maintain all Actions required by Attachment 2 to NRC Order EA-06-137, issued June 20, 2006, except the last action that requires incorporation of the strategies into the site security plan, contingency plan, emergency plan and/or guard training and qualification plan, as appropriate.

3. Additional Conditions

The Additional Conditions contained in Appendix B, as revised through Amendment No. 310, are hereby incorporated into this license. Duke Energy Progress, LLC shall operate the facility in accordance with the Additional Conditions.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

J. E. Dyer, Director
Office of Nuclear Reactor Regulation

Attachments:
1. Unit 2 – Technical Specifications – Appendices A and B

Date of Issuance: June 26, 2006

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. (continued) | D.5 Restore DG to OPERABLE status. | ---------NOTE---------<br>Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, the 14 day and 17 day Completion Times are extended to 30 days and 33 days, respectively.<br>----------<br><br>7 days from discovery of unavailability of SUPP-DG<br><br>AND<br><br>24 hours from discovery of Condition D entry ≥ 6 days concurrent with unavailability of SUPP-DG<br><br>AND<br><br>14 days<br><br>AND<br><br>17 days from discovery of failure to meet LCO 3.8.1.a or b |

(continued)

ACTIONS (continued)

| | | | |
|---|---|---|---|
| E. Two or more offsite circuits inoperable for reasons other than Condition B. | E.1 | Declare required feature(s) inoperable when the redundant required feature(s) are inoperable. | 12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s) |
| | AND | | |
| | E.2 | Restore all but one offsite circuit to OPERABLE status. | 24 hours |

(continued)

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.8.1.1 | Verify correct breaker alignment and indicated power availability for each offsite circuit. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.2 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.<br>3. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>4. Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.2 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 3750 V and $\leq$ 4300 V and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz. | In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.3 | ----------NOTES----------<br>1. DG loadings may include gradual loading.<br>2. Momentary transients outside the load range do not invalidate this test.<br>3. This Surveillance shall be conducted on only one DG at a time.<br>4. This SR shall be preceded by and immediately follow, without shutdown, a successful performance of SR 3.8.1.2 or SR 3.8.1.7.<br>5. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>6. Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.3 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2800 kW and ≤ 3500 kW. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.4 | Verify each engine mounted tank contains ≥ 150 gal of fuel oil. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.5 | Check for and remove accumulated water from each engine mounted tank. | In accordance with the Surveillance Frequency Control Program |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.8.1.6 | ----------NOTE----------<br>Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR 3.8.1.6 for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.<br>----------<br>Verify the fuel oil transfer system operates to transfer fuel oil from the day fuel oil storage tank to the engine mounted tank. | In accordance with the Surveillance Frequency Control Program |
| SR 3.8.1.7 | ----------NOTES----------<br>1. All DG starts may be preceded by an engine prelube period.<br>2. A single test at the specified Frequency will satisfy this Surveillance for both units.<br>----------<br>Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage ≥ 3750 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3750 V and ≤ 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. | In accordance with the Surveillance Frequency Control Program |

(continued)

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 276 | Upon implementation of Amendment No. 276 adopting TSTF–448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by SR 3.7.3.3, in accordance with TS 5.5.13.c.(i), the assessment of CRE habitability as required by Specification 5.5.13.c.(ii), and the measurement of CRE pressure as required by Specification 5.5.13.d, shall be considered met. Following implementation:<br>(a) The first performance of SR 3.7.3.3, in accordance with Specification 5.5.13.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from June 11, 2004, the date of the most recent successful tracer gas test.<br>(b) The first performance of the periodic assessment of CRE habitability, Specification 5.5.13.c.(ii), shall be within the next 9 months.<br>(c) The first performance of the periodic measurement of CRE pressure, Specification 5.5.13.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test. | As described in paragraphs (a), (b), and (c) of this Additional Condition. |
| 290 | The fuel channel bow standard deviation component of the channel bow model uncertainty used by ANP-10307PA, *AREVA MCPR Safety Limit Methodology for Boiling Water Reactors* (i.e., TS 5.6.5.b.11) to determine the Safety Limit Minimum Critical Power Ratio shall be increased by the ratio of channel fluence gradient to the nearest channel fluence gradient bound of the channel measurement database, when applied to channels with fluence gradients outside the bounds of the measurement database from which the model uncertainty is determined. | Upon implementation of Amendment No. 290 |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, Diesel Generators 1, 2, and 3 shall be protected. | Upon implementation of Amendment No. 310. |

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 310 | The SUPP-DG, FLEX diesel generators, station batteries, battery chargers, switchyard, and transformer yard shall be protected, as defense-in-depth, during the extended EDG Completion Times authorized by Amendment No. 310. | Upon implementation of Amendment No. 310. |
| 310 | Component testing or maintenance of safety systems in the off-site power systems and important non-safety equipment in the off-site power systems which can increase the likelihood of a plant transient or LOOP will be avoided during the extended EDG Completion Times authorized by Amendment No. 310. | Upon implementation of Amendment No. 310. |
| 310 | Discretionary switchyard maintenance shall not be allowed during the extended EDG Completion Times authorized by Amendment No. 310. | Upon implementation of Amendment No. 310. |
| 310 | The High Pressure Coolant Injection (HPCI) pump, Reactor Core Isolation Cooling (RCIC) pump, and the Residual Heat Removal (RHR) pump associated with the operable EDGs will not be removed from service for elective maintenance activities during the extended EDG Completion Times authorized by Amendment No. 310. | Upon implementation of Amendment No. 310. |
| 310 | The system load dispatcher shall be contacted once per day to determine if any significant grid perturbations (i.e., high grid loading unable to withstand a single contingency of line or generation outage) are expected during the extended Completion Times authorized by Amendment No. 310. If significant grid perturbations are expected, station managers will assess the conditions and determine the best course for the plant. | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, weather conditions shall be monitored each shift to determine if forecasts are predicting severe weather conditions (e.g., thunderstorm or tornado warnings). If severe weather is expected, station managers will assess the conditions and determine the best course for the plant. | Upon implementation of Amendment No. 310. |

| Amendment Number | Additional Conditions | Implementation Date |
|---|---|---|
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, dedicated non-licensed operators (NLOs) shall be briefed, each shift, regarding cross tying the 4160 V emergency bus E2 to 4160 V emergency bus E4 per plant procedure 0AOP-36.1, *Loss of Any 4kV OR 480V Bus.* | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, dedicated NLOs will be briefed, each shift, regarding cross-tying 480 V E7 bus to the 480 V E8 bus per 0AOP-36.1, *Loss of Any 4kV OR 480V Bus.* | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, dedicated NLOs will be briefed, each shift, regarding starting and tying the SUPP-DG to 4160 V emergency bus E4 per plant procedure 0EOP-01-SBO-08, *Supplemental DG Alignment.* | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, designated NLOs will be briefed, each shift, regarding load shed procedures and alignment of the FLEX diesel generators. | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, a continuous fire watch shall be established for the Unit 2 Cable Spread Room and for the Balance of Plant busses in the Unit 2 Turbine Building 20 foot elevation. | Upon implementation of Amendment No. 310. |
| 310 | During the extended EDG Completion Times authorized by Amendment No. 310, the FLEX pump and FLEX Unit 2 hose trailer shall be staged at the south side of the Unit 2 Condensate Storage Tank to support rapid deployment in the event the FLEX pump is needed for Unit 2 inventory control. | Upon implementation of Amendment No. 310. |

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

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# RELATED TO AMENDMENTS NOS. 282 AND 310

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

# DUKE ENERGY PROGRESS, LLC

# BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

# DOCKET NOS. 50-325 AND 50-324

## 1.0 INTRODUCTION

By letter dated November 22, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17326B619), as supplemented by a letter dated November 24, 2017 (ADAMS Accession No. ML17328A682), Duke Energy Progress, LLC (Duke Energy, the licensee) submitted an emergency license amendment request (LAR) for a one-time extension of the emergency diesel generator (EDG) No. 4 (EDG 4) completion time (CT) described in the Technical Specifications (TSs) for Brunswick Steam Electric Plant (BSEP) Unit Nos. 1 and 2. Specifically, the emergency LAR would extend the TS 3.8.1, Required Action D.5, from 14 days to 30 days. The licensee also proposed a commensurate change to extend the maximum CT of Required Action D.5 associated with discovery of failure to meet Limiting Condition for Operation (LCO) 3.8.1.a or b (i.e., from 17 days to 33 days). In addition, the licensee has requested to suspend monthly testing of EDGs 1, 2, and 3 per Surveillance Requirement (SR) 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the proposed extended CTs, if applicable.

## 2.0 REGULATORY EVALUATION

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the LAR based on the following regulatory requirements:

- The BSEP design was reviewed for construction under the *General Design Criteria for Nuclear Power Plant Construction*, issued for comment by the Atomic Energy Commission in July 1967 and is committed to meet the intent of the General Design Criteria (GDC), published in the *Federal Register* on May 21, 1971, as Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50. GDC 17, "Electric power systems," requires that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components (SSCs) that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the

likelihood of their simultaneous failure under operating and postulated accident and environmental conditions.

- GDC 18, "Inspection and testing of electric power systems," of Appendix A, to 10 CFR Part 50 requires, in part, that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards to assess the continuity of the systems and the condition of their components.

- 10 CFR 50.36, "Technical specifications," requires, in part, that the applicants for a license authorizing operation of a production or utilization facility must include in their application proposed TSs in accordance with the requirements of 10 CFR 50.36. 10 CFR 50.36(c) requires that TS include items in five specific categories related to station operation. These categories are (1) Safety limits, limiting safety system settings, and limiting control settings, (2) Limiting conditions for operation (LCOs), (3) Surveillance requirements (SRs), (4) Design features, and (5) Administrative controls. The proposed change to the BSEP TSs relates to the LCO and SRs categories.

- 10 CFR 50.63, "Loss of all alternating current power," requires, in part, that a nuclear power plant shall be able to withstand for a specified duration, and recover from a complete loss of offsite and onsite alternate current (AC) sources (i.e., a station blackout (SBO)).

- 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," requires, in part, that performing maintenance activities shall not reduce the overall availability of the SSCs, which are important to safety of the plant.

The staff also reviewed the LAR based on the following regulatory guidance documents:

- Regulatory Guide (RG) 1.93, "Availability of Electric Power Sources," provides guidance with respect to operating restrictions or CT if the number of available AC sources is less than that required by the TS LCO. In particular, this guide recommends a maximum CT of 72 hours for an inoperable onsite or offsite AC source.

- RG 1.155, "Station Blackout," provides guidance for complying with the requirement in 10 CFR 50.63 that nuclear power plants be capable of coping with a SBO event for a specified duration.

- NUREG-0800, Branch Technical Position (BTP) 8-8, "Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions," dated February 2012 (ADAMS Accession No. ML113640138) provides guidance to the NRC staff in reviewing LARs for licensees proposing a one-time or permanent TS change to extend an EDG Allowed Outage Time (AOT) beyond 72 hours. The BTP 8-8 emphasizes that more defense-in-depth is needed for SBO scenarios which are more likely to occur as compared to the less likely occurrence of the large and medium size loss-of-coolant accident (LOCA) scenarios.

- Generic Letter 80-30, "Clarification of the Term 'Operable' as it Applies to Single Failure Criterion for Safety Systems Required by Technical Specifications," that allows a plant to

temporarily depart from the single-failure design criterion when the plant is operating within a TS action requirement.

## 3.0 TECHNICAL EVALUATION

### 3.1 Description of the Brunswick Units 1 and 2, AC Power System

Normal plant power for each unit's auxiliaries is supplied by the 24 kilovolt (kV) to 4.16 kV unit auxiliary transformer which is connected to its associated generator output. The startup power for each unit's auxiliaries is supplied by the 230 kV to 4.16 kV startup transformer, which is fed from the 230 kV switchyard. The startup transformers also provide power required in the event of a design basis accident condition. Standby power is provided by four EDGs that are started automatically on loss of voltage on the 4.16 kV buses or on a LOCA signal. The EDGs are Nordberg Model No. FS-1316-HSC.

The auxiliary power to major loads is supplied at 4160 voltage. The nonsafety-related loads are fed from 4160 volt (V) Buses 1B, 1C, 1D, and Common A for Unit 1; and Buses 2B, 2C, 2D, and Common B for Unit 2. The safety-related 4160 V system buses for Units 1 and 2 are E1, E2, E3, and E4. The safety-related buses E1 and E2 are normally fed from upstream buses 1D and 1C respectively. Similarly, the safety-related buses E3 and E4 are normally fed from upstream buses 2D and 2C respectively. The upstream buses (B, C, D, and the Common) are in turn fed from the respective unit's 24 kV main generator through a unit auxiliary transformer (UAT) during normal plant operation, and from the 230 kV offsite power through the respective startup auxiliary transformer (SAT) during startup and shutdown operation. Buses 1C, 1D, 2C, and 2D are provided with an automatically initiated, automatically executed, quick dead bus transfer. The scheme is capable of quickly transferring each bus section and its loads from the normal source (i.e., UAT) to the preferred source (i.e., SAT) in the event of loss of the normal source or a unit trip. In the case of loss of offsite power, each safety-related bus (E1 through E4) is fed from its respective EDG. All AC loads necessary for the safe shutdown of the plant under accident or non-accident conditions are fed from the E-buses' distribution system.

The four 4.16 kV emergency buses, E1 through E4, can be connected to each other through two normally open tie-breakers. The electrical design, breaker control logic, and procedures prevent any two 4.16 kV redundant emergency buses from being tied together except during a SBO or Appendix R fire event.

Four EDGs provide standby power for the engineered safety features on the loss of the normal power sources. Once an EDG is automatically connected to the emergency bus, the logic recognizes which unit is in an accident condition and automatically starts the appropriate engineered safety features, according to a prescribed timed sequence.

Each EDG has a continuous rating of 3500 kilowatt (kW) and a 2000-hour rating of 3850 kW adequately sized for the following conditions:

- Design basis accident on one unit and orderly shutdown of the other unit under loss of offsite power LOOP conditions with three EDGs operating (i.e., LOCA/LOOP loading).
- Simultaneous safe shutdown of both units under LOOP conditions with three EDGs operating (i.e., LOOP loading).
- SBO loading with one EDG available (safe shutdown of the non-blackout unit while supplying the SBO coping loads of the blackout unit).

3.2 Station Blackout

BSEP uses the alternate AC (AAC) source operation approach for compliance with the requirement of 10 CFR 50.63. BSEP is subject to a minimum SBO coping capability of 4 hours with the EDG reliability target of 0.975. A SBO is assumed to occur in only one of the units. The non-blackout unit (after assuming a single EDG failure) is capable of sharing a single EDG with the blackout unit. With only one EDG available, it is necessary to load strip and cross-tie the 4.16 kV and 480V buses to provide power to both units. Within the first hour of SBO, the crosstie is established between the 4.16 kV buses of SBO unit and non-SBO unit. After the crosstie is established, the AAC power source can support the coping requirements (i.e., supply battery chargers) in the blackout unit.

In year 2014, the licensee permanently installed a supplemental diesel generator (SUPP-DG) to supply power to any of the four 4160 V emergency buses via a balance of the plant (BOP) circuit path. The SUPP-DG is commercial-grade and not designed to meet Class 1E requirements. This SUPP-DG was installed to support an extended CT (from 7 days to 14 days) in the event of an inoperable EDG (details provided in license amendment issued on February 24, 2014, ADAMS Accession No. 13329A362). The SUPP-DG is rated at 4000 kW, 4160 V, and can be connected to the 4160 V emergency buses (i.e., E1, E2, E3, or E4) in approximately 1 hour. The SUPP-DG is made available as a defense-in-depth alternate source of AC power to any one emergency bus to mitigate a SBO event. The SUPP-DG remains disconnected from the Class 1E distribution system except for testing or as required during a loss of power condition.

The SUPP-DG has a 10,000 gallon fuel oil storage tank with a minimum of 6,700 gallons, which is a 24-hour supply. The FLEX diesels each have an integral 526 gallon sub-base fuel oil tank, and they have a system to draw oil from the four EDGs' day-tanks. The licensee stated that they have approximately 5,000 gallons of additional fuel oil on site and availability of a site fuel truck to supply fuel oil to the SUPP-DG and the FLEX diesels as needed.

As part of FLEX strategies to meet the requirements of NRC Order EA-12-049, the licensee has also permanently installed two 500 kW FLEX diesel generators. Each is a fully contained system, capable of starting and operating with no reliance on other equipment or systems. The FLEX diesel generators feed 480 V emergency buses E6 and E8. Critical FLEX loads are then fed from E6, E8, and through bus ties, from 480 V emergency buses E5, and E7 using the existing electrical system. The FLEX critical loads are primarily battery chargers and uninterruptible power supplies.

The licensee also has contacted INNA Oil, their contracted fuel oil supplier. INNA Oil is a local supplier with a facility within 10 miles of the site. INNA Oil is able to deliver a tanker of fuel oil to the site given a 12-hour notice.

3.3 Proposed TS Changes

Current TS Requirements

Current TS 3.8.1, Condition D allows an EDG to be inoperable for a maximum of 14 days provided that SUPP-DG is available, or 7 days if SUPP-DG is unavailable.

SR 3.8.1.2 verifies that each EDG starts from standby conditions and achieves steady state voltage greater than or equal to (≥) 3750 V and less than or equal to (≤) 4300 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz. The Frequency of SR 3.8.1.2 is "In accordance with the Surveillance Frequency Control Program (SFCP)." The current Frequency for SR 3.8.1.2, in the BSEP SFCP, is 31 days.

SR 3.8.1.3 verifies that each EDG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2800 kW and ≤ 3500 kW. The Frequency of SR 3.8.1.3 is "In accordance with the SFCP." The current Frequency for SR 3.8.1.3, in the BSEP SFCP, is 31 days.

SR 3.8.1.6 verifies that the fuel oil transfer system operates to transfer fuel oil from the day fuel oil storage tank to the engine mounted tank. The Frequency of SR 3.8.1.6 is "In accordance with the SFCP." The current Frequency for SR 3.8.1.6, in the BSEP SFCP, is 31 days.

EDG Failure Cause Determination

In the LAR and the supplement, the licensee stated that the direct cause of this event is degradation and failure of the affected EDG 4 bearings over time, as evidenced by the increasing aluminum trend in the EDG 4 lubricating oil. Preliminary investigation has indicated that two events in 2009 (i.e., EDG 4 overspeed and overload) put a higher than normal stress on the rotating mass of EDG 4. This is believed to be the initiator leading to the condition causing bearing degradation over time, because lead was detected in two lube oil samples tested shortly after the overspeed and overload events occurred. Lubricating oil trends have been reviewed for all EDGs, and no other EDGs have any indications of elevated lead or aluminum (i.e., which would be indicative of EDG bearing degradation), or other adverse performance trends. The licensee has also reviewed vibration data for all four EDGs, and vibrations are in the normal range. Also, the most recent hot web deflection on EDGs 1, 2, and 3 have shown satisfactory results, which indicated no bow in their crankshafts. As such, there is no similar degraded condition of other EDG bearings or crankshafts and no common cause exists.

The licensee stated that EDGs 2 and 3 had overload conditions in the past. On June 14, 2014, the EDG 2 kW loading briefly exceeded the 3850 kW limit sporadically over a period of three minutes. The maximum load reached was 3923 kW. On November 5, 2017, EDG 3 was loaded, in error, to greater than the maximum load. EDG 3 operated above 3850 kW for a total period of 19 seconds, with the maximum load of approximately 4100 kW.

The NRC staff has reviewed the licensee's failure cause determination that states that the degradation and failure of the affected bearings were caused by overspeed and overload events in 2009 that put a higher than normal stress on the rotating mass of EDG 4. The NRC staff finds the licensee's assessment to be reasonable. The NRC assessment is based on the fact that lead was detected in two lube oil samples tested shortly after the overspeed and overload events occurred. The licensee stated that in both samples, the levels of lead detected were well below the trigger value for further action and continued to be so in subsequent samples to the present day. This indicated the start of the degradation of the bearings. The degraded bearings led to the crankshaft bow. The NRC staff also finds that EDGs 1, 2, and 3 are not susceptible to the same type of failure mechanism. Both EDGs 2 and 3 had an overload condition in the past, but they did not have an overspeed condition similar to EDG 4. No aluminum has been detected in the EDG 1, 2, and 3 lube oil samples, which indicates no bearing degradation. Also, the vibration data for all four EDGs are normal.

Description of Proposed Change

The licensee has proposed to add the following Note to the CT for TS 3.8.1, Required Action D.5.

> ----------NOTE----------
> Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, the 14 day and 17 day Completion Times are extended to 30 days and 33 days, respectively.
> ----------

The licensee has also proposed to suspend monthly testing of EDGs 1, 2, and 3 per SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the period when EDG 4 is inoperable. Because the surveillances are being suspended rather than extending their Frequencies, the proposed change adds notes to each of the affected SRs.

> ----------NOTE(S)----------
> Until DG 4 is returned to OPERABLE status, not to exceed 0745 EST on December 13, 2017, performance of SR [ ] for EDGs 1, 2, and 3 may be suspended. Past due surveillances will be completed within 7 days of restoration of EDG 4 operability or December 20, 2017, whichever occurs first.
> ----------

3.4 Deterministic Evaluation

3.4.1 Meeting the Accident Analysis Requirement

In the LAR, the licensee provided the following details of continued capability of meeting the accident analysis:

> EDG capacity is such that any three of the four diesels can supply all required loads for the safe shutdown of one unit and a design basis accident on the other unit without offsite power. Each of the four EDGs can supply one of the four separate Class 1E emergency buses. Each is started automatically on a loss of offsite power (LOOP) or LOCA. The EDG arrangement provides adequate capacity to supply the ESF loads for the Design Basis Accident, assuming the failure of a single active component in the system.
>
> Since the EDGs can accommodate a single failure, the one-time extension of the CT for an inoperable EDG has no impact on the system design basis. Safety analyses acceptance criteria as provided in the Updated Final Safety Analysis Report (UFSAR) are not impacted by this change. AC power sources credited in the accident analyses will remain the same.

After reviewing the LAR, supplement, and the relevant UFSAR section, the staff finds that three EDGs will remain available and continue to meet the accident analysis without offsite power, as stated in Section 3.1 of this evaluation. The licensee will secure the remaining EDGs during the proposed extended CT, as discussed under compensatory measures, Section 3.4.3 of this

evaluation. Consistent with the Generic Letter 80-30, it is not necessary to consider another single failure (in addition to failure of EDG 4) while in TS Action Statement for a limited time.

3.4.2 Meeting the SBO Requirement

In the LAR, the licensee provided the following details of continued capability of meeting the SBO requirements:

> BSEP's coping time during SBO is not affected by the proposed change. The coping time is calculated based on guidance provided in Nuclear Utility Management and Resource Council (NUMARC) 87-00, Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors, Revision 1, August 1991 (i.e., Reference 1). During a SBO, the most significant requirement is to quickly restore AC power to the 125 VDC battery chargers. To extend battery capacity to the four hour coping duration, battery chargers are required to be energized within one hour by one of the following methods:
>
> - Cross-tying of 4160 volt emergency buses with the non blacked out unit, powered from offsite power or EDGs, and if necessary cross-tie 480 V emergency buses
> - Aligning a FLEX diesel generator to the Division II 480 V emergency bus and if necessary cross-tie 480 V emergency buses
> - Aligning the Supplemental diesel generator
>   - Via the BOP 4160 V bus to the associated 4160 V emergency bus
>   - If necessary, cross-tie to the other unit's 4160 V emergency bus
>   - If necessary, cross-tie 480 V emergency buses
>
> To accomplish the above, SBO flow charts and associated text procedures provide instructions for coping with a SBO or an Extended Loss of All AC Power (ELAP) when no EDGs are available, when one EDG is available, when two EDGs are available, or when offsite power is available to one unit, supplying either one or two 4160 V emergency buses. These coping methodologies are not changed by the proposed one-time extension of the Required Action D.5 CTs. If an offsite power source or an additional EDG becomes inoperable or if the SUPP-DG becomes unavailable during the proposed CT extensions, the appropriate TS 3.8.1 Condition will be entered and Required Actions taken.

In response to the NRC staff request as to how the licensee would meet the intent of BTP 8-8 for a dual unit plant, the licensee's supplement describes the sequence of events, and the loadings of SUPP-DG and the remaining EDGs, under the following postulated scenarios, to achieve cold shutdown of both units:

Scenario 1

LOOP in both units, EDG 4 (Unit 2) on maintenance, EDG 3 (Unit 2) fails - single failure in Unit 2; EDG 1 (Unit 1) fails – single failure in Unit 1 [Only SUPP-DG and EDG 2 available]

In this case, Unit 2 would be considered the blacked-out unit and procedure 2EOP-01-SBO, *Station Blackout*, would be entered. Electrical configuration in this case would require cross-tie of 4 kV bus E2 to E4 (i.e., EOP-01-SBO-06) and crosstie of bus 480V bus E7 to E8 (i.e., EOP-01-SBO-07). SUPP-DG would be aligned to E3 (i.e., EOP-01-SBO-08). The 4 kV bus E3 would then be cross tied with E1 (i.e., EOP-01-SBO-06). FLEX DG2 would be available, if needed to power limited loads on E8 (i.e., battery chargers).

Scenario 2

LOOP in both units, EDG 4 (Unit 2) on maintenance, EDG 3 (Unit 2) fails - single failure in Unit 2; EDG 2 (Unit 1) fails – single failure in Unit 1 [Only SUPP-DG and EDG 1 available]

In this case, Unit 2 would be considered the blacked-out unit (2EOP-01-SBO). Electrical configuration in this case would require cross-tie of 4 kV bus E1 to E3 (EOP-01-SBO-06) and powering 480V bus E8 from FLEX DG2 per EOP-01-FSG-04. SUPP-DG would be aligned to E4 (EOP-01-SBO-08). The 4 kV bus E2 would then be cross tied with E4 (EOP-01-SBO-06). Coordinate the transfer of E8 to SUPP-DG (E4) with Emergency Response Organization team as additional loads are required on bus E8.

The licensee also provided expected loadings for SUPP-DG and the remaining EDG for both the scenarios, which would remain well below the ratings of both the SUPP-DG and EDGs.

The staffs finds the above response meets the defense-in-depth intent of BTP 8-8, and therefore, is acceptable.

3.4.3. Compensatory Measures/Additional Defense-in Depth Measures

In the LAR, the licensee stated as follows:

> The following compensatory measures were implemented to support proposed extended Completion Times of Required Action D.5. They will remain in place during the proposed extended Completion Time.
>
> - Diesel Generators 1, 2, and 3 shall be protected during the extended EDG Completion Times authorized by the proposed license amendments.
>
> - The SUPP-DG, FLEX diesel generators, station batteries, battery chargers, switchyard, and transformer yard shall be protected, as defense-in-depth, during the extended EDG Completion Times authorized by the proposed license amendments.
>
> - Component testing or maintenance of safety systems in the off-site power systems and important non-safety equipment in the off-site power systems which can increase the likelihood of a plant transient or LOOP, as determined by plant management, will be avoided during the extended EDG Completion Times authorized by the proposed license amendments.
>
> - Discretionary switchyard maintenance shall not be allowed during the extended EDG Completion Times authorized by the proposed licensed amendments.

- The High Pressure Coolant Injection (HPCI) pump, Reactor Core Isolation Cooling (RCIC) pump, and the Residual Heat Removal (RHR) pump associated with the operable EDG will not be removed from service for elective maintenance activities during the extended EDG Completion Times authorized by the proposed license amendments.

- The system load dispatcher shall be contacted once per day to determine if any significant grid perturbations (i.e., high grid loading unable to withstand a single contingency of line or generation outage) are expected during the extended Completion Times authorized by the proposed license amendments. If significant grid perturbations are expected, station managers will assess the conditions and determine the best course for the plant.

- During the extended EDG Completion Times authorized by the proposed license amendments, weather conditions shall be monitored each shift to determine if forecasts are predicting severe weather conditions (e.g., thunderstorm or tornado warnings). If severe weather is expected, station managers will assess the conditions and determine the best course for the plant.

Additionally, the licensee proposed to implement the following compensatory actions associated with the Operations staff as license conditions during the proposed extended Completion Times of Required Action D.5:

- During the extended EDG Completion Times authorized, designated non-licensed operators (NLOs) shall be briefed, each shift, regarding cross tying the 4160 V emergency bus E2 to 4160 V emergency bus E4 per plant procedure 0AOP-36.1, Loss of Any 4kV OR 480V Bus

- During the extended EDG Completion Times authorized by the proposed license amendments, designated NLOs will be briefed, each shift, regarding cross-tying 480 V E7 bus to the 480 V E8 bus per 0AOP-36.1, *Loss of Any 4kV OR 480V Bus*.

- During the extended EDG Completion Times authorized by the proposed license amendments, designated NLOs will be briefed, each shift, regarding starting and tying the SUPP-DG to 4160 V emergency bus E4 per plant procedure 0EOP-01-SBO-08, *Supplemental DG Alignment*.

- During the extended EDG Completion Times authorized by the proposed license amendments, designated NLOs will be briefed, each shift, regarding load shed procedures and alignment of the FLEX diesel generators.

- During the extended EDG Completion Times authorized by the proposed license amendments, a continuous fire watch shall be established for the Unit 1 and Unit 2 Cable Spread Rooms and for the Balance of Plant busses in the Unit 1 and Unit 2 Turbine Building 20 foot elevations.

- During the extended EDG Completion Times authorized by the proposed license amendments, the FLEX pump and FLEX Unit 2 hose trailer shall be staged at the south side of the Unit 2 Condensate Storage Tank to support rapid deployment in the event the FLEX pump is needed for Unit 2 inventory control.

For the compensatory measures described above, the licensee has proposed operating license conditions to be included in Appendix B, Additional Conditions, of the Renewed Facility Operating Licenses for BSEP, Units 1 and 2.

The staff finds that the above compensatory measures will provide defense-in-depth, add to the safety Risk Management of the plant and are appropriate measures for managing the increase in risk per 10 CFR 50.65(a)(4); therefore, the measures are acceptable.

3.4.4 Proposed temporary suspension of performance of SRs

The licensee stated that the proposed suspension of SR 3.8.1.2 and SR 3.8.1.3 testing requirements during the proposed extended CTs minimizes risk by maintaining defense-in-depth. Performance of SR 3.8.1.2 or SR 3.8.1.3 requires the affected EDG to be declared inoperable. For EDGs 1 and 3, this is a short duration inoperability that occurs when the EDGs are being barred. The existing EDG 2 governor will not automatically return the EDG to ready-to-load operation when the EDG is in manual mode. During performance of SR 3.8.1.2 or SR 3.8.1.3, EDG 2 is in manual mode for approximately 4 hours. With EDG 4 inoperable, a second EDG made inoperable for testing requires both Unit 1 and Unit 2 to enter TS 3.8.1, Condition G. If the EDG being tested is not restored to operable status within 2 hours, Condition H would be entered and both units would be required to be in Mode 3 within 12 hours. SR 3.8.1.6 verifies the fuel oil transfer system transfers fuel oil from the day fuel oil storage tank to the engine mounted tank. This SR is performed in conjunction with the EDG operation when fuel is consumed from the engine mounted tank. The licensee requests that these SRs for EDG 1, 2, and 3 be suspended during the proposed extended CTs.

The Brunswick UFSAR states that each EDG has a prelube oil pump that continuously circulates warm lube oil through the engine or filter when the engine is not operating. Because each EDG has a prelube oil pump that continuously circulates warm lube oil, the staff finds this acceptable since it will ensure that the bearings in the EDGs will be well lubricated during the extended time between the SRs.

Suspension of the SRs for the small period of time proposed for the EDG 4 outage maintains the other EDGs in a stand-by state for the entire time period rather than making the other DGs unavailable for testing. Additionally as stated by the licensee:

> The overall risk of not performing SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the period EDG 4 inoperability is minimal. The time period is short and historical routine performance of these surveillances have demonstrated good performance of the EDGs. There is no indication of degraded performance of EDGs 1, 2, or 3. The proposed suspension of performing the SRs is consistent

> with the philosophy of SR 3.0.3 in that it is based on the consideration of unit conditions and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the requirements.

Based on the above review, the staff finds the temporary suspension of SRs 3.8.1.2, 3.8.1.3 and 3.8.1.6 acceptable. Other than the temporary suspension, the SRs remain unchanged and therefore will continue to meet 10 CFR 50.36(c)(3).

3.4.5 Safety Margin

The licensee will continue to meet the accident analysis requirements (considering no additional failure in safety-related equipment in any other train except those impacted by the EDG 4 outage train). The staff finds that there will be no or minimal reduction in safety margin.

3.4.6 Risk Insights Evaluation

In the subject LAR, the licensee stated that the basis for the proposed TS CT change is a "onetime, deterministic emergency license amendment to extend the 14 day and 17 day CT associated with TS 3.8.1, Required Action D.5," and is based upon the defense-in-depth guidance of BTP 8-8. Therefore, it is not a risk-informed LAR and a risk evaluation was not submitted for the purpose of making a regulatory decision. The NRC staff determined that "special circumstances," as defined by NUREG-0800, Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," which would have necessitated additional risk information be provided, did not exist. As such, the staff did not request any additional risk information associated with the review of this LAR.

While this is not a risk-informed LAR, the licensee did provide risk insights related to the proposed TS CT change in Attachment 4 of the LAR. The licensee indicated that the NRC has previously reviewed the technical adequacy of the BSEP Probabilistic Risk Assessment (PRA) models for "Relocation of Specific Surveillance Frequency Requirements to a Licensee-Controlled Program" (ADAMS Accession No. ML17096A129) and "License Amendment to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" (ADAMS Accession No. ML14310A808). The PRA models were previously reviewed to the extent needed to support previous risk-informed LARs. Because this is not a risk-informed LAR, the PRA models used to derive risk insights in Attachment 4 were not reviewed by the staff to determine their technical acceptability to support this LAR. As a result, the staff did not rely on the numerical results provided by the licensee.

However, the staff considered the licensee-provided risk insights to aid in the deterministic review of the proposed change. The staff also performed an independent assessment using the NRC's Brunswick 1 and 2 Standardized Plant Analysis Risk (SPAR) Models to evaluate the risk contribution from internal events, high winds, and seismic hazards.

The licensee-provided risk insights and the NRC SPAR model insights and results both supported the engineering conclusions associated with the appropriateness of the licensee's proposed compensatory actions. The currently available risk insights and results did not challenge the engineering conclusions that the proposed change maintains defense-in-depth.

3.4.7 Technical Evaluation Summary

Based on the above technical evaluation, the NRC staff finds the proposed TS changes will have minimal impact on the continued safe operation and safe shutdown capability of the plant, and are therefore acceptable. The licensee will continue to meet the regulatory requirements listed in Regulatory Evaluation Section 2.0, except those GDCs temporarily impacted by non-availability of a redundant source of safety-related onsite power while the plant is in a TS Action Statement. Although BTP 8-8 provides a limit of a CT extension to 14 days, this limit was based on industry experience for a typical major EDG overhaul without complications. The staff took into consideration the circumstances the licensee described in the LAR while reviewing this one-time LAR for a EDG CT extension from 14 days to 30 days (additional 16 days), and a commensurate change in CT extension from 17 days to 33 days (additional 16 days) from discovery of failure to meet LCO 3.8.1.a or b.

## 4.0 EMERGENCY SITUATION

The licensee stated that EDG 4 was removed from service, in support of planned maintenance, on November 13, 2017, at 0745 hours EST. The original scope of work included investigation into the cause of an increasing trend of aluminum in the diesel lubricating oil. The trend in aluminum has been at very low levels, well below action level, dating back to November 2009. Aluminum first increased above the lower limit of detectability in the first quarter of 2013, and a trend of increasing aluminum was identified by Strategic Engineering in 2017. During the planned maintenance window, main bearings 7 and 8 were found degraded. A total of five main bearings were replaced to correct the condition of the bearings. The investigation also identified that the EDG 4 crankshaft has a bow, as indicated by a total runout of 0.010 inches on main bearing 7.

In June 2009, the licensee took Hot Web Deflection measurements for EDG 4, which confirmed crankshaft straightness. Subsequent to that inspection, two events occurred in September 2009 that put a higher than normal stress on the rotating mass of EDG 4. During a governor tuning evolution in September 2009, EDG 4 was operated up to the overspeed trip on four occasions. The overspeed trip setpoint is approximately 12-percent above nominal run speed. On September 24, 2009, EDG 4 was operated above the 2000-hour rating of 3850 kW for a total of 8 seconds over the course of 4 minutes. The peak loading was 4154.2 kW (approximately 19 percent of the continuous rated load). The licensee surmised that these two events, taken together, caused the initial bearing damage that created a heat input into the crankshaft, eventually resulting in a bow in the crankshaft. The licensee believes that the crankshaft bow has increased over several years of normal EDG operation post-2009, and, in a self-propagating cycle, increased bearing degradation and the shaft runout. Replacement of the main bearings, which tightened clearances, during the planned maintenance window revealed the need to correct the crankshaft bow.

The EDG 4 crankshaft has been evaluated, and the shaft is acceptable for continued operation, pending correction of the excessive runout and bow. The shaft hardness is within specifications, and there are no indications of cracking or excessive shaft heating as determined by magnetic particle testing. A specialty vendor service has been contracted to correct the crankshaft bow in situ (i.e., inside the crankcase). This has required additional disassembly within the crankcase to access and correct the condition.

Additionally, connecting rods 6R, 7L, 7R, and 8L were removed from the engine and were examined. Each connecting rod was inspected for signs of damage or foreign material. Connecting rod 7L contained small particulate from the degraded main bearing in the oil channel leading to the wrist pin, which was removed via an air flush. The licensee deemed that the connecting rods were acceptable for reinstallation, as no damage was present.

Straightening of the crankshaft will correct the condition leading to the main bearing degradation, and is in progress. The increase in the original work scope will extend the EDG 4 maintenance outage beyond the current TS 3.8.1, Condition D, CT of 0745 hours EST on November 27, 2017, at which time TS 3.8.1, Condition H would be entered requiring both units to be in Mode 3 within 12 hours.

While the sequence to repair the crankshaft and restore the EDG to an operable status is understood, this is a first-time performance of this maintenance activity at BSEP. Duke Energy is requesting that, on a one-time basis, the CT for TS 3.8.1, Required Action D.5, be extended from 14 days to 30 days. A commensurate change is also proposed to extend the maximum CT of Required Action D.5 associated with discovery of failure to meet LCO 3.8.1.a or b (i.e., from 17 days to 33 days). The requested CT extensions provide time for the potential discovery of additional issues.

The licensee stated that based on information available prior to the ongoing EDG 4 maintenance outage, prudent action was initiated to address the elevated aluminum trend in the EDG 4 lubricating oil. The aluminum levels were well below action levels prior to the planned maintenance outage. Planning for the EDG 4 outage included the parts and resources necessary to accomplish the expected scope of work, including main bearing replacements, well within the current TS 3.8.1, Required Action D.5 CT. Identification of the bowed EDG 4 crankshaft has resulted in an additional work scope that cannot be completed within the current CT. There was no available data that could have indicated that the EDG 4 crankshaft was bowed. Vibration data was in the normal range. Therefore, the need for this emergency LAR was unavoidable.

The extended CTs are necessary due to the complex and extensive nature of the work necessary to restore EDG 4 to operable status. This work includes additional bearing replacements as well as the crankshaft repair. Repair of the crankshaft is a first time maintenance activity for BSEP. A specialty vendor service has been contracted to correct the crankshaft bow. This has required additional disassembly within the crankcase to access and correct the condition, as well as the ~~and~~ coordination of vendor resources and equipment necessary to perform the repairs.

The NRC staff reviewed the licensee's explanation above as well as independently confirmed it on site and found it acceptable, because the licensee took appropriate action to address an adverse condition detected in EDG 4 by removing it from service for repair. However, the time required to implement the complex and comprehensive corrective action unexpectedly exceeded the current allowable CT. Therefore, the emergency situation could not have been avoided.

## 5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The Commission may issue a license amendment before the expiration of the 60-day period provided that its final determination is that the amendment involves no significant hazards

consideration. These amendments are being issued prior to the expiration of the 60-day period. Therefore, a final finding of no significant hazards consideration follows.

The Commission has made a final determination that the amendment request involves no significant hazards consideration. Under the Commission's regulations in 10 CFR 50.92, this means that operation of the facility in accordance with the proposed amendment does not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

As required by 10 CFR 50.91(a), in its letter dated November 22, 2017, the licensee has provided its analysis of the issue of no significant hazards consideration, which is presented below:

Duke Energy has evaluated whether a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, *Issuance of amendment*, as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed license amendment provides a deterministic one-time 30 day Completion Time allowance in TS 3.8.1, Required Action D.5 for one EDG and a commensurate change to extend the maximum Completion Time of Required Action D.5 (i.e., from 17 days to 33 days) and suspension of SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6. These changes will have no effect on accident probabilities since the EDGs are not considered accident initiators. The proposed Completion Times and surveillance suspension do not require any physical plant modifications. Since no individual precursors of an accident are affected, the proposed amendment does not increase the probability of a previously analyzed event.

   The consequences of an evaluated accident are determined by the operability of plant systems designed to mitigate those consequences. The EDGs are backup power to components that mitigate the consequences of accidents. The current TSs permit a single EDG to be inoperable for up to 14 days. This is acceptable provided the Supplemental Diesel Generator is available. The proposed license amendment extends the current Completion Times for EDG 4, on a one-time basis, to no more than a total of 30 days with a corresponding maximum completion time of 33 days. The proposed change does not affect any of the assumptions used in deterministic safety analysis. Likewise, the temporary suspension of SR 3.8.1.2, SR 3.8.1.3 and SR 3.8.1.6 has no impact on any of the assumptions used in deterministic safety analysis. Granting the proposed change will not adversely affect the consequences of an accident previously evaluated.

Therefore, the proposed amendments do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

Creation of the possibility of a new or different kind of accident requires creating one or more new accident precursors. New accident precursors may be created by modifications of plant configuration, including changes in allowable modes of operation.

The proposed amendment provides a deterministic one-time allowance of a 30 day Completion Time for TS 3.8.1, Required Action D.5 and a commensurate change to extend the maximum Completion Time of Required Action D.5 (i.e., from 17 days to 33 days). In conjunction, the proposed amendment provides a temporary suspension of SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6. These changes do not involve a modification or the physical configuration of the plant (i.e., no new equipment will be installed), create any new failure modes for existing equipment, or create any new limiting single failures. The plant equipment considered available when evaluating the existing Completion Times remains unchanged. The extended Completion Times and the temporary suspension of SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 will permit completion of repair activities without incurring transient risks associated with performing a dual unit shutdown with the EDG unavailable.

Therefore, the proposed amendments do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed license amendment provides a deterministic one-time allowance of a 30 day Completion Time for TS 3.8.1, Required Action D.5. A commensurate change is also proposed to extend the maximum Completion Time of Required Action D.5 (i.e., from 17 days to 33 days). A deterministic evaluation of the proposed Completion Times demonstrates there is sufficient margin to safety during the extended EDG Completion Time period. During the extended completion times, sufficient compensatory measures including availability of the Supplemental Diesel Generator will be established to maintain the defense-in-depth design philosophy to ensure the electrical power system meets its design safety function. The Supplemental Diesel Generator has the capacity to bring an affected unit to cold shutdown, if needed.

The overall risk of not performing SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 during the extended Completion Times is minimal and is consistent with defense-in-depth philosophy. The time period of the temporary suspension is short and historical routine performances of SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 have demonstrated good performance of the EDGs. The proposed suspension of performing SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.6 is consistent with the philosophy of SR 3.0.3 in that it is based on the consideration of unit conditions and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the requirements.

Therefore, the proposed amendments do not result in a significant reduction in the margin of safety.

Based on its review of the licensee's no significant hazards consideration analysis quoted above, the NRC staff has determined that the proposed amendments involve no significant hazards consideration.

Accordingly, the Commission has determined that these amendment involve no significant hazards information.

## 6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the North Carolina State official was notified by phone on November 24, 2017, of the proposed issuance of the amendments. The State official had no comments.

## 7.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

## 8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) the amendments do not (a) involve a significant increase in the probability or consequences of an accident previously evaluated; or (b) create the possibility of a new or different kind of accident from any accident previously evaluated; or (c) involve a significant reduction in a margin of safety; (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (3) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (4) the

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

Principal Contributors: V. Goel
R. Wolfgang
S. Lyons
P. Snyder
A. Hon

Date: November 26, 2017

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS FOR TECHNICAL SPECIFICATION 3.8.1, "AC [ALTERNATING CURRENT] SOURCES – OPERATING" ONE-TIME EXTENSION OF EMERGENCY DIESEL GENERATOR COMPLETION TIMES AND SUSPENSION OF SURVEILLANCE REQUIREMENTS (**EMERGENCY SITUATION)** (EPID L-2017-LLA-0392) DATED NOVEMBER 26, 2017

DISTRIBUTION:
PUBLIC
PM Reading File
RidsNrrDorlLpl2-2 Resource
RidsNrrLABClayton Resource
RidsACRS_MailCTR Resource
RidsRgn2MailCenter Resource
RidsNrrDssStsb Resource
RidsNrrDeEeob Resource
RidsNrrDeEmib Resource
RidsNrrDraApib Resource
RidsNrrPMBrunswick Resource
VGoel, NRR
SLyons, NRR
RWolfgang, NRR
PSnyder, NRR

**ADAMS Accession No. ML17328B072** *By email, +Comments incorporated

| OFFICE | NRR/DORL/LPL2-2/PM | NRR/DORL/LPL2-2/LA | NRR/DE/EEOB/BC*+ |
|---|---|---|---|
| NAME | AHon | BClayton | JQuichocho |
| DATE | 11/25/17 | 11/25/17 | 11/25/17 |
| OFFICE | NRR/DE/EMIB/BC*+ | NRR/DRA/APLB/RILI(A)*+ | NRR/DSS/STSB/BC* |
| NAME | SBailey (RWolfgang for) | MReisi-Fard | VCusumano (CTilton for) |
| DATE | 11/25/17 | 11/25/17 | 11/25/17 |
| OFFICE | OGC – NLO*+ | NRR/DORL/LPL2-2/BC | NRR/DORL/LPL2-2/PM |
| NAME | CKanatas | UShoop (GCasto for) | AHon |
| DATE | 11/26/17 | 11/26/17 | 11/26/17 |

**OFFICIAL RECORD COPY**