



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

November 20, 2017

Mr. Thomas D. Ray
Site Vice President
Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672-0752

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 – ISSUANCE OF AMENDMENTS REGARDING THE TECHNICAL SPECIFICATIONS FOR ELECTRICAL POWER SYSTEMS (CAC NOS. MF7417, MF7418, AND MF7419; EPID NO. L-2016-LLA-0002)

Dear Mr. Ray:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment Nos. 406, 408, and 407 to Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments revise the Technical Specifications in response to the application from Duke Energy Carolinas, LLC dated February 26, 2016 (ON-2016-021), as supplemented by letters ONS-2017-007, ONS-2017-042, and ONS-2017-069 dated January 30, June 1, and October 13, 2017, respectively. The amendments revise Technical Specification 3.8.1, "AC [Alternating Current] Sources – Operating," to allow sufficient time for the replacement of the stator of each Keowee Hydro Unit. The staff's safety evaluation of the amendments is enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to be "AK", written over a horizontal line.

Audrey L. Klett, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:

1. Amendment No. 406 to DPR-38
2. Amendment No. 408 to DPR-47
3. Amendment No. 407 to DPR-55
4. Safety Evaluation

cc w/encls: Distribution via Listserv



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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 406
Renewed License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Oconee Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. DPR-38, filed by Duke Energy Carolinas, LLC (the licensee), dated February 26, 2016, and supplemented by letters dated January 30, June 1, and October 13, 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 as 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 set forth in 10 CFR Chapter I;
 - 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.

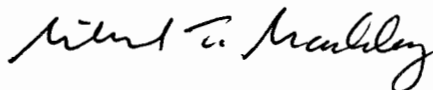
2. Accordingly, the license is hereby amended by changes to the Operating License and Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-38 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 406, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-38
and the Technical Specifications

Date of Issuance: November 20, 2017



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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 408
Renewed License No. DPR-47

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. DPR-47, filed by Duke Energy Carolinas, LLC (the licensee), dated February 26, 2016, and supplemented by letters dated January 30, June 1, and October 13, 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 as 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 set forth in 10 CFR Chapter I;
 - 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.

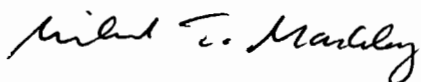
2. Accordingly, the license is hereby amended by changes to the Operating License and Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-47 is hereby amended to read as follows:

- B. Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 408, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-47
and the Technical Specifications

Date of Issuance: November 20, 2017



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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 407
Renewed License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Oconee Nuclear Station, Unit 3 (the facility), Renewed Facility Operating License No. DPR-55, filed by Duke Energy Carolinas, LLC (the licensee), dated February 26, 2016, and supplemented by letters dated January 30, June 1, and October 13, 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 as 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 set forth in 10 CFR Chapter I;
 - 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.

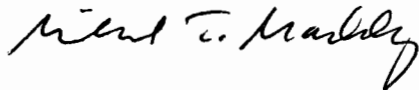
2. Accordingly, the license is hereby amended by changes to the Operating License and Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-55 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 407, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-55
and the Technical Specifications

Date of Issuance: November 20, 2017

ATTACHMENT TO

AMENDMENT NO. 406 RENEWED FACILITY OPERATING LICENSE NO. DPR-38

AMENDMENT NO. 408 RENEWED FACILITY OPERATING LICENSE NO. DPR-47

AMENDMENT NO. 407 RENEWED FACILITY OPERATING LICENSE NO. DPR-55

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

Replace the following pages of the Operating Licenses and the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

Insert Pages

Operating Licenses

Operating Licenses

License No. DPR-38, page 3
License No. DPR-47, page 3
License No. DPR-55, page 3

License No. DPR-38, page 3
License No. DPR-47, page 3
License No. DPR-55, page 3

Technical Specifications

Technical Specifications

3.8.1-4
3.8.1-5
3.8.1-6

3.8.1-4
3.8.1-5
3.8.1-6

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 406 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

Any particular bulk power supply transaction may afford greater benefits to one participant than to another. The benefits realized by a small system may be proportionately greater than those realized by a larger system. The relative benefits to be derived by the parties from a proposed transaction, however, should not be controlling upon a decision with respect to the desirability of participating in the transaction. Accordingly, applicant will enter into proposed bulk power transactions of the types hereinafter described which, on balance, provide net benefits to applicant. There are net benefits in a transaction if applicant recovers the cost of the transaction (as defined in ¶1 (d) hereof) and there is no demonstrable net detriment to applicant arising from that transaction.

1. As used herein:

- (a) "Bulk Power" means electric power and any attendant energy, supplied or made available at transmission or sub-transmission voltage by one electric system to another.
- (b) "Neighboring Entity" means a private or public corporation, a governmental agency or authority, a municipality, a cooperative, or a lawful association of any of the foregoing owning or operating, or proposing to own or operate, facilities for the generation and transmission of electricity which meets each of

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 408 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

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2. As used herein:

- (c) "Bulk Power" means electric power and any attendant energy, supplied or made available at transmission or sub-transmission voltage by one electric system to another.
- (d) "Neighboring Entity" means a private or public corporation, a governmental agency or authority, a municipality, a cooperative, or a lawful association of any of the foregoing owning or operating, or proposing to own or operate, facilities for the generation and transmission of electricity which meets each of

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 407 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

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3. As used herein:

- (e) "Bulk Power" means electric power and any attendant energy, supplied or made available at transmission or sub-transmission voltage by one electric system to another.
- (f) "Neighboring Entity" means a private or public corporation, a governmental agency or authority, a municipality, a cooperative, or a lawful association of any of the foregoing owning or operating, or proposing to own or operate, facilities for the generation and transmission of electricity which meets each of

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p>C.2.2.3 -----NOTE----- Not applicable to remaining KHU and its required underground emergency power path or LCO 3.3.21 when in Condition H to perform generator stator replacement work.</p> <p>-----</p> <p>Verify by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE and the requirements of LCO 3.8.3, "DC Sources-Operating," LCO 3.8.6, "Vital Inverters-Operating," LCO 3.8.8, "Distribution Systems-Operating," LCO 3.3.17, "EPSL Automatic Transfer Function," LCO 3.3.18, "EPSL Voltage Sensing Circuits," LCO 3.3.19, "EPSL 230 kV Switchyard DGVP," and LCO 3.3.21, "EPSL Keowee Emergency Start Function" are met.</p> <p><u>AND</u></p>	<p>72 hours</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p>C.2.2.4 Verify alternate power source capability by performing SR 3.8.1.16.</p> <p><u>AND</u></p> <p>C.2.2.5 Restore KHU and its required overhead emergency power path to OPERABLE status.</p>	<p>72 hours</p> <p><u>AND</u></p> <p>Every 31 days thereafter</p> <p>28 days when Condition due to an inoperable Keowee main step-up transformer</p> <p><u>AND</u></p> <p>-----NOTE-----</p> <ol style="list-style-type: none"> 1. Not to exceed 45 days cumulative per rolling 3-year time period for each KHU. 2. Not applicable during generator stator replacement work. 3. Not applicable until 1 year after the KHU is declared OPERABLE following generator stator replacement work for planned work. <p>-----</p> <p>45 days from discovery of initial inoperability when Condition due to an inoperable KHU</p>

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)		<p><u>AND</u></p> <p>-----NOTE-----</p> <ol style="list-style-type: none"> 1. No discretionary maintenance or testing allowed on SSF, PSW, EFW and essential AC Power Systems. 2. Only applicable one time for each KHU due to generator stator replacement work and expires on September 30, 2021. 3. Only applicable if the SSF, PSW, and EFW are administratively verified OPERABLE prior to entering the extended Completion Time. <p>-----</p> <p>55 days from initial inoperability when Condition due to an inoperable KHU to perform generator stator replacement work</p>
D. KHU or its required underground power path inoperable.	<p>D.1 Perform SR 3.8.1.4 for OPERABLE KHU.</p> <p><u>AND</u></p> <p>D.2 Energize either standby bus from LCT via isolated power path.</p>	<p>1 hour if not performed in previous 12 hours</p> <p>24 hours</p> <p><u>AND</u></p> <p>1 hour from subsequent discovery of deenergized required standby bus</p>

(continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION FOR
AMENDMENT NO. 406 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-38
AMENDMENT NO. 408 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-47
AMENDMENT NO. 407 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-55

DUKE ENERGY CAROLINAS, LLC

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 INTRODUCTION

By letter ON-2016-021 dated February 26, 2016,¹ as supplemented by letters ONS-2017-007, ONS-2017-042, and ONS-2017-069 dated January 30, June 1, and October 13, 2017,² respectively, Duke Energy Carolinas, LLC (the licensee), applied for license amendments to change the Technical Specifications (TSs) for the Oconee Nuclear Station, Units 1, 2, and 3 (Oconee), which are contained in Appendix A of Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55. The licensee proposed changes to TS 3.8.1, "AC [Alternating Current] Sources – Operating," to allow sufficient time for the replacement of the stator of each Keowee Hydro Unit (KHU).

By electronic mail (e-mail) dated December 21, 2016, and September 22, 2017,³ the U.S. Nuclear Regulatory Commission (NRC) staff (i.e., "the staff") requested additional information from the licensee. By letters dated January 30, and October 13, 2017, the licensee responded to the requests. The supplements dated January 30, June 1, and October 13, 2017, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on July 5, 2016 (81 FR 43650).

¹ Batson, Scott L., Duke Energy Carolinas, LLC, letter to U.S. Nuclear Regulatory Commission, February 26, 2016, Agencywide Documents Access and Management System (ADAMS) Accession No. ML16064A020.

² Ray, Thomas D., Duke Energy Carolinas, LLC, letters to U.S. Nuclear Regulatory Commission, January 30, June 1, and October 13, 2017, ADAMS Accession Nos. ML17032A347, ML17159A526, and ML17292A050, respectively.

³ Hall, Randy, U.S. Nuclear Regulatory Commission, e-mail to Christopher J. Wasik, Duke Energy Carolinas, LLC, December 21, 2016, ADAMS Accession No. ML17150A002. Klett, Audrey, U.S. Nuclear Regulatory Commission, e-mail to Christopher J. Wasik et al., Duke Energy Carolinas, LLC, September 22, 2017, ADAMS Accession No. ML17265A252.

2.0 REGULATORY EVALUATION

2.1 System Descriptions and Requirements

Electrical Power Systems

Section 8.1 of the Updated Final Safety Analysis Report (UFSAR), Revision 26, states that an offsite power system and an onsite power system are provided for each unit to supply the unit auxiliaries during normal operation and the reactor protection system and engineered safeguards protection systems during abnormal and accident conditions. Each Oconee unit has the following sources of electrical power available to the engineered safeguards protection systems: the 230-kilovolt (kV) transmission system and/or the 525-kV transmission system, two KHUs, and the 100-kV transmission system. The onsite power systems include the main generator unit to auxiliary transformers 1T, 2T, and 3T; the 230- kV switchyard to startup transformers CT1 (i.e., Common Transformer 1), CT2, and CT3; the Keowee overhead power path through Power Circuit Breaker 9; the Keowee underground power path through transformer CT4, and the Lee Steam Station through transformer CT5 to the standby buses.

Per Section 8.2 of the UFSAR, the offsite power system includes the 525-kV, 230-kV, and 100-kV switching stations and networks, which are served by 125-volt (V) direct current power systems. The 100-kV system is connected to the Lee Steam Station, which has two combustion turbine generators. Section 3.1.39 of the UFSAR states that each nuclear unit can receive emergency power from the 230-kV switching station through its start-up transformer as a preferred source. Section 8.1 of the UFSAR states that the onsite power system for each unit consists of a main generator, a unit auxiliary transformer, a startup transformer, the Keowee Hydro Station, the Standby Shutdown Facility, batteries, the CT4 transformer, and the auxiliary power system. Section 8.3.1 of the UFSAR describes the onsite alternating current power systems, which includes the KHUs and the 6.9-kV, 4.16-kV, 600-V, and 208-V auxiliary systems.

The Keowee Hydro Station contains two units (i.e., the KHUs) that are rated at 87,500 kilovolt-amperes (kVA) each while the maximum combined load demand on one nuclear unit with a loss-of-coolant accident and a loss-of-offsite power at all three units is 15,971 kVA. The KHUs generate power at 13.8 kV and serve as the standby onsite emergency power source. Upon a loss of power from the Oconee generating units and the 230-kV switchyard, both KHUs start automatically and accelerate to full speed within 23 seconds from receipt of the emergency startup initiation signal. In its application dated February 26, 2016, the licensee stated that the KHUs provide power to the shutdown buses through two separate and independent routes: an underground path, or feeder line, from one KHU through transformer CT4, and an overhead path, or power line, from the other KHU through startup transformers CT1, CT2, or CT3 and the startup breakers (i.e., the E Breakers).

Section 8.2.1.4 of the UFSAR provides details on power sources using a 100-kV Switching Station. In the event that the 230-kV offsite power system and the onsite KHUs are unavailable, the standby buses can be powered either directly from a 100-kV Central Tie Substation or from Lee Steam Station via a 100-kV transmission line connected to Transformer CT5. This single 100-kV circuit is connected to the 100-kV transmission system through the substation at Central located eight miles from Oconee. Central Substation is connected to Lee Steam Station twenty-two miles away through a similar 100-kV line. If an emergency occurs that would require the use of the 100-kV transmission system, this line can either be isolated from the balance of the transmission system to supply emergency power to Oconee from Lee Steam Station, or

emergency power can be supplied directly from the 100-kV system from the Central Tie Substation.

In its application dated February 26, 2016, the licensee stated that a nearby hydro unit (i.e., Duke Energy's Jocassee Hydroelectric Station) can be used as an additional backup power source to provide additional defense-in-depth for the electrical power system at Oconee. In its application, the licensee stated that a Jocassee Hydro Unit can be black-started, aligned and dedicated to Oconee via a power path isolated from the grid in accordance with approved procedures in approximately one hour. The Jocassee Hydro Station contains four units rated at 195 megawatts each. All four units generate at 14.4 kV, which is then stepped up to 230 kV.

TS 3.8.1, "AC Sources – Operating," establishes requirements for alternating current electrical power sources when the Oconee units are in MODES 1 through 4. The limiting condition for operation (LCO) requires, in part, that two offsite sources and two KHUs be operable. If a KHU or its required overhead emergency power path are inoperable because of a reason other than an inoperable unit startup transformer, then TS 3.8.1 Required Action C.2.2.3 requires the licensee to verify the remaining KHU, its required underground emergency power path, and both required offsite sources are operable, among other actions, in 72 hours. However, this required action was not applicable to the remaining KHU and its required underground emergency power path when the licensee entered TS Condition H to perform generator field pole rewind work.

TS 3.8.1 Required Action C.2.2.5 requires the licensee to restore the KHU and its required overhead emergency power path to operable status within 45 days from discovery of initial inoperability when the condition is caused by an inoperable KHU. The completion time for this action is not to exceed 45 days cumulative per a rolling 3-year time period for each KHU; however, this action is not applicable during generator field pole rewind work or until one year after the KHU is declared operable following generator field pole rewind work. Required Action C.2.2.5 of TS 3.8.1 also requires the licensee to restore the KHU and its required overhead emergency power path to operable status within 62 days from initial inoperability when the condition is from an inoperable KHU to perform generator field pole rewind work. For this condition, no discretionary maintenance or testing was allowed on the standby shutdown facility (SSF), emergency feedwater system (EFW), and essential AC Power systems, and the SSF and EFW had to be verified operable prior to entering the extended completion time. The required action was only applicable one time for each KHU for generator field pole rewind work and expired on January 1, 2015.

The TS 3.8.1 Bases state that the alternating current power system includes offsite power sources and the onsite standby power sources (i.e., the KHUs). The TS 3.8.1 Bases states that this system is designed to supply the required engineered safeguards loads of one unit and safe shutdown loads of the other two units and is arranged so that no single failure can disable enough loads to jeopardize plant safety.

Standby Shutdown Facility (SSF)

Sections 9.6, and 8.3 of the UFSAR describe the SSF, which houses stand-alone standby systems that are designed to maintain the plant in a safe and stable condition following postulated emergency events that are distinct from the design basis accidents for which the plant systems were originally designed. The SSF systems provide additional defense-in-depth protection for the health and safety of the public by serving as a backup to existing safety systems. As such, the SSF provides an alternate means to achieve and maintain MODE 3 with an average reactor coolant temperature greater than or equal to 525 degrees Fahrenheit (°F)

following postulated events. The SSF electrical power system supplies power to maintain hot shutdown of the reactors of each unit in the event of loss-of-power from all other power systems. The SSF power system consists of a dedicated diesel generator switchgear, load center, motor control centers, panelboards, batteries, battery chargers, inverters and interconnecting cable supplying the appropriate loads. The SSF diesel generator is rated for continuous operation at 3500 kilowatts, 0.8 power factor, and 4160 V alternating current. The SSF diesel generator is provided with manual start capability from the SSF only. The SSF is capable of maintaining all three units in MODE 3 with an average reactor coolant temperature greater than or equal to 525 °F, for a period of 72 hours following certain events, such as a fire, turbine building flood, or a station blackout.

Protected Service Water (PSW) System

In its application dated February 26, 2016, the licensee stated that the PSW system provides a diverse means to achieve and maintain safe shutdown by providing secondary side decay heat removal, reactor coolant pump seal cooling, primary system inventory control, and reactor coolant system boration for reactivity management during certain plant scenarios that disable the 4160-V essential electrical power distribution system. The licensee stated that the PSW system is not an Engineered Safety Feature Actuation System and is not credited to mitigate design basis events as contained in UFSAR Chapters 6 and 15. The licensee stated that no credit is taken in the safety analyses for PSW system operation following design basis events. The licensee stated that the PSW system is designed as a standby system for use under emergency conditions and provides added defense-in-depth protection by serving as a backup to existing safety systems. The licensee stated that the PSW system is provided as an alternate means to achieve and maintain safe shutdown conditions for one, two or three units following postulated scenarios that damage essential systems and components normally used for safe shutdown.

Emergency Feedwater (EFW) System

In its application dated February 26, 2016, the licensee stated that the EFW system automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of the normal feedwater supply. The licensee stated that the EFW pumps take suction through suction lines from the upper surge tank and condenser hotwell and pump to the steam generator secondary side through the EFW nozzles. The steam generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam relief valves or atmospheric dump valves. If the main condenser is available, steam may be released via the Turbine Bypass System and recirculated to the condenser hotwell.

2.2 Licensee's Proposed Changes

The Keowee hydroelectric station has been in service since 1971. In 2009, the licensee identified the need for major refurbishment work within the generators, including generator field pole rewinds and stator replacement. The licensee completed the generator pole rewinds in February 2014 and August 2014 for each KHU. In its application dated February 26, 2016, the licensee stated that it currently plans to replace the generator stator in each KHU starting in January 2019. Therefore, the licensee proposed to revise TS 3.8.1 to allow sufficient time to replace the generator stator of each KHU.

In its application dated February 26, 2016, the licensee stated that the KHU turbine generators are powered through a common intake (penstock) by water taken from Lake Keowee. To isolate one KHU from the common intake for major maintenance activities, both KHUs must be removed from service. The common intake must be de-watered to allow the unit designated for maintenance to be sealed. After sealing the unit designated for maintenance, the common penstock is then re-watered allowing the designated operating unit to be returned to service. Each KHU is individually sealed at its wicket gates, which are internal to the machine, prior to the maintenance. If two KHUs are under maintenance, the dewatering, rewatering, and sealing processes have to be repeated, one at a time.

The licensee proposed a change to the TS 3.8.1 Required Action C.2.2.3 NOTE to allow use of the 60-hour dual KHU outage to disassemble and reassemble the KHU and return it to a functional condition. In its application dated February 26, 2016, the licensee stated that without this note, entry into Condition L would be required, and the TSs would allow only 16 hours to restore the KHU and its required underground path or only 4 hours to restore compliance with the LCO in TS 3.3.21, "Emergency Power Switching Logic (EPSL) Keowee Emergency Start Function." The licensee stated in its application that the note for Required Action L allows a 12-hour delay prior to starting the 4-hour completion time clock when entered for the purposes of restoring the KHU undergoing maintenance. The licensee proposed to revise the NOTE for TS 3.8.1 Required Action C.2.2.3 on TS page 3.8.1-4 to state (proposed addition is underlined, and proposed deletion is struck through):

Not applicable to remaining KHU and its required underground emergency power path or LCO 3.3.21 when in Condition H to perform generator ~~field pole rewind~~ stator replacement work.

TS 3.8.1 Required Action C.2.2.5 requires the KHU and its required overhead emergency power path to be restored to operable status within 45 days of discovery of an initial inoperability when Condition C is entered due to an inoperable KHU if not used for that KHU in the previous 3 years. The licensee stated that this 45-day time period is not sufficient to allow the KHU generator stator replacement work to be performed and, therefore, proposed to add a temporary completion time to Required Action C.2.2.5 that would allow 55 days to restore an inoperable KHU caused by the stator replacement to be used once for each KHU. The licensee proposed to replace the expired 62-day completion time for an inoperable KHU that was used for the Keowee field pole rewind work with a 55-day completion time for TS 3.8.1 Required Action C.2.2.5 that is applicable only to the generator stator replacement work. The licensee proposed to replace the expired January 1, 2015, date with a new expiration date of September 30, 2021. The licensee proposed to require verification that the PSW System is operable prior to entering the extended completion time and to preclude discretionary maintenance or testing on the PSW System.

The licensee proposed to revise the NOTE above the 45-day completion time for TS 3.8.1 Required Action C.2.2.5 on TS page 3.8.1-5 to state (proposed additions are underlined, and proposed deletions are struck through):

1. Not to exceed 45 days cumulative per rolling 3-year time period for each KHU.
2. Not applicable during generator ~~field pole rewind~~ stator replacement work.
3. Not applicable until 1 year after the KHU is declared OPERABLE following generator ~~field pole rewind~~ stator replacement work for planned work.

The licensee proposed to retain Note 2 to avoid using up the 45-day completion time concurrent with the proposed new 55-day completion time and to provide time to perform emergent maintenance work should the need arise. Note 3 would impose a 1-year waiting period for planned work.

The licensee proposed to revise the NOTE above the 62-day completion time for TS 3.8.1 Required Action C.2.2.5 on TS page 3.8.1-6 to state (proposed additions are underlined, and proposed deletions are struck through):

1. No discretionary maintenance or testing allowed on SSF, PSW, EFW and essential AC Power Systems.
2. Only applicable one time for each KHU due to generator ~~field pole rewind stator replacement~~ work and expires on ~~January 1, 2015~~ September 30, 2021.
3. Only applicable if the SSF, PSW, and EFW are administratively verified OPERABLE prior to entering the extended Completion Time.

The licensee proposed to revise the 62-day completion time for TS 3.8.1 Required Action C.2.2.5 on TS page 3.8.1-6 to state (proposed additions are underlined, and proposed deletions are struck through):

5562 days from initial inoperability when Condition due to an inoperable KHU to perform generator ~~field pole rewind~~ stator replacement work.

The licensee stated that the proposed changes are similar to those previously reviewed and approved by the NRC on January 8, 2014,⁴ to support the KHU generator pole rewinds. The differences include a 55-day completion time for stator outage versus a 62-day completion time for the pole rewind outages; the TS would require the PSW system to be verified operable prior to entering the extended completion time and that no discretionary maintenance or testing will be allowed on the PSW system; Note 3 to the 45-day completion time would only require a 1-year waiting period after stator replacement for planned work versus all work; and the SSF would be continuously staffed during dual KHU outages when the penstock is dewatered versus during any dual KHU outage.

2.3 Regulatory Review

The staff considered the following regulatory requirements and licensing and design basis information during its review of the proposed changes.

Regulatory Requirements

Paragraph 50.36(c) of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that the TSs include items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements; (4) design features; and (5) administrative controls. Paragraph 50.36(c)(2) states that when an LCO is not met, the

⁴ *Oconee Nuclear Station Units 1, 2 and 3 - Issuance of Amendments Temporary Technical Specification Change Request to Extend the Completion Time for an Inoperable Keowee Hydro Unit*, dated January 8, 2014, ADAMS Accession No. ML13357A674. The license amendment request, *Specification Change to Add a Required Action Completion Time for One Keowee Hydro Unit Inoperable for Generator Field Pole Rewinds*, dated February 27, 2012, ADAMS Accession No. ML12181A312.

licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

Section 50.63, "Loss of all alternating current power," of 10 CFR requires, in part, that all nuclear power plants be able to withstand for a specified duration and recover from a station blackout, which 10 CFR 50.2 defines as a complete loss of alternating current electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., a loss of offsite electric power system concurrent with a turbine trip and unavailability of the onsite emergency ac power system). The licensee describes its compliance with 10 CFR 50.63 in Section 8.3.2.2.4, "Station Blackout Analysis," of the UFSAR.

Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," of 10 CFR (i.e., the Maintenance Rule) requires the licensee to monitor the performance or condition of specified structures, systems, and components (SSCs) to provide reasonable assurance that the SSCs are capable of fulfilling their intended functions, and to balance preventive maintenance activities against the objective of minimizing the unavailability of the SSCs due to monitoring or preventive maintenance. Paragraph 50.65(a)(4) states that before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.

Design Basis

The Atomic Energy Commission (AEC) issued the construction permits for Oconee on November 6, 1967. The AEC issued the operating licenses for the three units on February 6, 1973, October 6, 1973, and July 19, 1974. The plants' general design criteria (GDC) are discussed in the UFSAR, Chapter 3.1, "Conformance with NRC General Design Criteria," and in the applicable UFSAR sections. The AEC published the final rule that added Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," in the FR (36 FR 3255) on February 20, 1971, with the rule effective on May 21, 1971. In accordance with an NRC staff requirements memorandum from S. J. Chilk to J. M. Taylor, "SECY-92-223 - Resolution of Deviations Identified During the Systematic Evaluation Program," dated September 18, 1992,⁵ the Commission decided not to apply the Appendix A GDC to plants with construction permits issued prior to May 21, 1971. Therefore, the GDC which constitute the licensing bases for Oconee are those in the UFSAR. As discussed in the UFSAR, the licensee made changes to the facilities and committed to some of the GDC from 10 CFR Part 50, Appendix A. Based on its review of UFSAR, Section 3.1 and Section 8.3, "Onsite Power Systems," and the licensee's submittals, the staff identified the following GDC as being applicable to the proposed amendment.

- UFSAR, Chapter 3, Section 3.1.24, "Criterion 24 – Emergency Power for Protection Systems," which states that in the event of a loss of all offsite power, sufficient alternate sources of power shall be provided to permit the required functioning of the Protective Systems. The UFSAR states that in the event of loss of all offsite power to all units at Oconee or to any unit alone, sufficient power for operation of the Protective Systems of any unit will be available from either of two onsite independent hydroelectric generators.

⁵ U.S. Nuclear Regulatory Commission, SECY-92-223 – *Resolution of Deviations Identified During the Systematic Evaluation Program*, September 18, 1992, ADAMS Accession No. ML003763736.

- UFSAR, Chapter 3, Section 3.1.39, "Criterion 39 – Emergency Power for Engineered Safety Features," which states that alternate power systems shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning required of the engineered safety features. The UFSAR states that as a minimum, the onsite power system and the offsite power system shall each, independently, provide this capacity assuming a failure of a single active component in each power system.

3.0 TECHNICAL EVALUATION

In determining whether an amendment to a license will be issued, the Commission is guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. The staff evaluated the licensee's application to determine if the proposed changes are consistent with the regulations and licensing and design basis information discussed in Section 2 of this safety evaluation. The staff reviewed the acceptability of the proposed changes against the reliability and availability of power sources to safely shut down the plant, conformance to the design bases described in the UFSAR, and compliance with 10 CFR 50.63, 10 CFR 50.65 and 10 CFR 50.36. The staff considered how the licensee's proposed changes impact the defense-in-depth aspects of the plant's design and operation and the adequacy of safety margins following the proposed change. The staff also considered plant and industry operating experience, as related to the proposed change, and the licensee's proposed compensatory measures to maintain plant safety during the period when one or both onsite power sources may not be available.

3.1 Electrical Power System Defense-in-Depth

Defense-in-depth⁶ is an approach to designing and operating nuclear facilities that prevents and mitigates accidents that could release radiation or hazardous materials. A key aspect of the defense-in-depth approach is creating multiple independent and redundant layers of defense to compensate for potential human and mechanical failures so that no single layer, no matter how robust, is exclusively relied upon. Defense-in-depth includes the use of access controls, physical barriers, redundant and diverse key safety functions, and emergency response measures.

The staff reviewed the availability and reliability of backup power sources for the emergency power system while a KHU would be inoperable for the planned generator stator replacement work to determine whether the proposed changes establish adequate defense-in-depth. As described in Section 2 of this safety evaluation, Oconee can receive offsite alternating current power from several sources while a KHU is undergoing a stator replacement, including the remaining KHU and a Lee Combustion Turbine (LCT). In its application, the licensee stated that Oconee can also receive power from either of the two Jocassee Hydro Units via alignment to the 230-kilovolt switchyard Yellow Bus.

In its application, the licensee provided data supporting the reliability of the KHUs, which has been greater than 99 percent reliable. The licensee credits an LCT as a backup power source when a KHU will be inoperable during the generator stator replacement work. In its application, the licensee stated that in January 2007, two new combustion turbines were installed at the Lee Steam Station, and the new LCTs have a starting reliability factor greater than 98 percent. In its application, the licensee stated that when one of the LCTs serves as an alternate emergency

⁶ <https://www.nrc.gov/reading-rm/basic-ref/glossary/defense-in-depth.html>.

power source during a dual KHU outage, the second LCT would be available but not running for the duration of the dual KHU outage. The licensee stated that it provides communication from the Oconee Control Room to the Lee Steam Station Control Room and that the operating procedure at the LCT site contains specific steps to align the second LCT to the Lee/Central Power Path to provide power to transformer CT5 and associated breakers.

In its application, the licensee also stated that the LCTs and the Lee/Central Power path are maintained to nuclear standards and have a robust preventive maintenance program. The LCTs are included in the licensee's maintenance rule program, which tracks their availability and reliability. The licensee stated that preventive maintenance and performance monitoring are performed on the LCTs to ensure continued equipment reliability.

To ensure safe shutdown capability in the event of a loss of all station power during the generator stator replacement work, the licensee stated that it will provide an additional backup power source and implement risk reduction measures as follows.

- The licensee will use a hydro unit from the Jocassee Hydroelectric Station as an additional backup power source to provide additional defense-in-depth for the electrical power system at Oconee. A Jocassee hydro unit can be black-started, aligned, and dedicated to Oconee via a power path isolated from the grid in approximately one hour. The licensee stated that in the unlikely event that all other power sources (i.e., the offsite power grid, KHU overhead line, KHU underground line, and transformer CT5) are unavailable, and Oconee is experiencing a station blackout, the licensee will enter emergency operating procedures and take appropriate steps to dedicate a Jocassee unit.
- The licensee will provide a temporary diesel generator at the Keowee Hydro Station to enable the recovery of the remaining operable but de-watered KHU within 4 hours. This recovery time is consistent with the required 4-hour station blackout coping duration for Oconee. The temporary diesel generator serves as a backup power source to operate Keowee Hydro Station electrical auxiliaries, the intake gate hoist to provide water to the remaining available KHU, and the powerhouse crane.

The licensee also stated that it can use the following systems and equipment to maintain all three Oconee units in a safe shutdown condition until credited onsite or offsite power sources can be restored if a loss of all station power occurs.

- The Turbine-Driven Emergency Feedwater Pump can provide feedwater to the steam generators of each Oconee unit.
- An onsite diesel-driven feedwater pump can provide feedwater to the steam generators of each Oconee unit.
- The PSW and SSF systems provide alternate shutdown capability.

Based on the above evaluation, the staff concludes that the licensee has several means of supplying electrical power to the safety buses to safely shutdown the Oconee units and maintain them in a safe shutdown condition in the event of loss of offsite power concurrent with the loss of the KHUs during the stator replacement project (i.e., that the proposed changes maintain a defense-in-depth approach). Therefore, the proposed changes maintain the licensee's

compliance with 10 CFR 50.63 and conformance to Oconee GDC 24 and GDC 39 and are acceptable.

3.2 Maintenance Activities and Compensatory Measures

The staff reviewed the licensee's planned maintenance activities, schedule, and compensatory measures for the KHU stator replacements to determine if the proposed TS changes are consistent with the requirements of 10 CFR 50.65. In its application dated February 26, 2016, the licensee provided the schedule for each KHU maintenance outage, which includes penstock dewatering, rotor sweep, generator rotor removal and installation, old generator stator lift, new generator stator lift and installation, and electrical testing. The scheduled activities also include balance runs and balance shots for data acquisition, collection of data from the thermal curve to validate generator parameters, and post-modification testing.

The licensee also included contingency plans if work is delayed, for example, because of bad weather or other issues occurring during the work. The licensee stated that a one-day contingency has been included prior to the start of each dual KHU maintenance outage to account for schedule delays caused by delayed entry into each dual KHU outage for severe weather. The licensee added three days of contingency to account for schedule delays caused by severe weather (e.g., icing, high humidity, or rain). The licensee stated it would not enter an extended single KHU maintenance outage or a dual KHU maintenance outage if severe weather is forecasted to occur within 2 days of the outage. In its letter dated January 30, 2017, the licensee responded to the staff's request for additional information dated December 21, 2016, related to additional contingencies, and stated that the contingency days account for subsequent severe weather delays for starting a dual KHU maintenance outage when in the outage.

In its email dated December 21, 2016, the staff also requested the licensee to confirm that prior to scheduling the maintenance outage, whether plant staff will review operating experience and historical weather patterns in order to minimize risk to plant power sources caused by severe weather. In its response dated January 30, 2017, the licensee stated that plant procedures require its staff to review operating experience and historical weather patterns during the development of critical activity plans for maintenance outages to manage risk during work activities, and that prior to the release of work for execution, operations personnel must consider the effects of severe weather and grid instabilities on plant operations. The licensee also stated that this qualitative evaluation is an inherent aspect of the duties of the work control center senior reactor operator, and responses to actual plant risk from severe weather or grid instabilities are programmatically incorporated into applicable plant emergency or response procedures.

The staff reviewed recent events at Oconee, one of which was a failure of Main Transformer MT1 that occurred on March 6, 2016, which led to the unavailability of the Keowee overhead emergency power path and an offsite power source. In its e-mail dated December 21, 2016, the staff requested the licensee to explain how power transformers, including overhead lines and connections, used for onsite and offsite power systems will be inspected and tested prior to the planned KHU outages and to summarize the most recent test results, including preventive maintenance, condition monitoring, and surveillances to demonstrate that the power sources are reliable and operable. In its response dated January 30, 2017, the licensee stated that it performs routine inspections on all of the large power transformers to ensure proper continuous operation, and that these tasks are performed in accordance with the Duke Energy nuclear fleet preventative maintenance guidelines. These tasks include manual oil sampling for dissolved

gas analysis every three months, thermographic scans every six months (with the exception of CT5 performed every two years), electrical (Doble) testing every two to four years, oil pump vibration testing every two years, and preventive maintenance inspections every two years to include overall visual inspection, bushing inspections, and ancillary device inspections.

In its supplement dated January 30, 2017, the licensee stated that as a result of the CT3 failure in the 230-kV offsite power system that occurred on December 7, 2015, it performed detailed inspections on the startup transformers, Keowee main step-up transformer, and Lee Steam Station power path transformer CT5 in the first quarter of 2016 to ensure no other issues were present. The licensee also increased the visual inspection frequency of the startup transformer bus lines from 6 years to 2 years. The licensee plans to complete these visual inspections prior to the first Keowee stator outage with the main transformer bus lines and startup transformer bus lines inspections being performed in the upcoming outages for each Oconee unit. Hence, the overhead lines for each of the startup and main transformers will have a detailed visual inspection during their respective outages prior to the first Keowee Stator outage.

The licensee stated that it will also inspect the connections at transformer CT-5 for the Lee Steam Station power path during a scheduled preventive maintenance (PM) of the transformer in 2018. The licensee stated that in addition to the detailed visual inspections, it routinely performs biannual thermography scans, daily operator rounds, and monthly switchyard and transformer maintenance rounds. Based on its review of the aforementioned information, the staff determined that there is reasonable assurance that the condition of the transformers is adequately monitored for maintaining reliability of power to safe shutdown busses.

During its evaluation of the defense-in-depth aspects of the electrical power system, the staff considered the licensee's response to operating experience related to the 230-kV overhead lines that are used to provide offsite power and that are aligned to the KHUs. On December 7, 2015, an auxiliary operator discovered the Oconee Unit 3 startup transformer CT3 with one of its phases disconnected at the phase bushing. The licensee subsequently performed extent-of-condition reviews and discovered broken power feed cable strands on all three phases of the Oconee Unit 1 startup transformer CT1.

In its letter dated January 30, 2017, the licensee stated that it plans to complete necessary open phase condition modifications by December 31, 2018, and that the first Keowee stator replacement maintenance is scheduled to begin in the middle of January 2019. The licensee subsequently indicated during routine discussions with the NRC's licensing project manager for Oconee that the open phase condition detection scheme may not be implemented prior to the stator replacement project.

In its letter dated October 13, 2017, the licensee discussed actions taken from operating experience at the site and the compensatory measures that will be in place during the stator outages. The licensee stated that the broken Y-phase conductor on CT3 was repaired, the conductors to the other two phases were trimmed, and conductors on CT1 were found degraded and repaired. The licensee performed a detailed inspection on each drop line and found no issues, replaced the drop lines to CT1 and CT3, and stated it would replace the drop lines to CT2 during the Oconee 2 Fall 2017 outage. The licensee stated that it conducts a monthly inspection of the startup transformers and a daily visual inspection of the drop line connections to each startup transformer during operator rounds. The licensee also stated that it will perform visual inspections of the startup transformers' drop lines that do not have an open phase protection system prior to entering each dual KHU outage and on each shift (i.e., day and night) during the dual KHU outages.

Based on the above evaluation, the staff concludes that the licensee's compensatory measures as described in the proposed TS changes and the licensee's application as supplemented, in addition to the maintenance of the power transformers prior to the KHU maintenance outage, the monthly inspections of the transformers, and the visual inspections of the drop line connections to each startup transformer, provide reasonable assurance that the safe shutdown capability of the Oconee units will be maintained during the planned KHU maintenance outages for the generator stator work and, therefore, are consistent with 10 CFR 50.65 requirements.

3.3 10 CFR 50.36 Evaluation

The NRC staff reviewed the licensee's proposed changes to TS 3.8.1. Based on its evaluation as documented in Sections 3.1 and 3.2 of this safety evaluation, the staff concludes that the proposed changes to TS Required Actions C.2.2.3 and C.2.2.5, completion times, and notes to allow a temporary one-time completion time extension of 55 days to restore an inoperable KHU for performing generator stator replacement work for each KHU is acceptable. The proposed TS changes, compensatory actions to provide additional backup power sources, and risk reduction measures provide reasonable assurance that safe shutdown capability of the Oconee units will be maintained in the event of a loss of all station power during the generator stator replacement work and that adequate protection to public health and safety will be provided. The staff concludes that the licensee has adequately addressed the vulnerability of Oconee during a dual KHU outage for the major refurbishment work of the generator stator, and that the proposed changes are acceptable. Therefore, the staff finds that proposed changes to the remedial actions and completions times meet the requirements of 10 CFR 50.36(c)(2) and are acceptable.

4.0 REGULATORY COMMITMENTS

In Enclosure 2 of the licensee's application dated February 26, 2016, the licensee provided the following regulatory commitments, which reflect the results of its probabilistic risk assessment review that determined that the risk during the stator replacement improves if no maintenance is performed on the SSF, EFW System, and the AC Power System.

	Commitment	Completion Date
1	No discretionary maintenance or testing is allowed on SSF, PSW, EFW, and essential AC Power Systems.	During 55-day completion time for TS 3.8.1 Required Action C.2.2.5
2	No discretionary maintenance or testing on the offsite power system (230-kV Switchyard) will be performed, and the operability of required offsite circuits should be maintained at all times.	During 55-day completion time for TS 3.8.1 Required Action C.2.2.5
3	The licensee commits to include the following risk reduction measures in the Critical Activity Plan: <ul style="list-style-type: none"> • Oconee will not start the extended single KHU outage or a dual KHU outage if severe weather conditions are forecast within 2 days. • Oconee will contact the system load dispatcher once per day to ensure no significant grid perturbations (high grid loading not able to withstand a single contingency of line or generation outage) are expected during extended TS completion time. 	During KHU generator stator outages

	<ul style="list-style-type: none"> • Oconee will control the steam-driven emergency feedwater pump on each Oconee unit as “protected” equipment during the extended TS completion time. • Oconee will continuously staff the SSF during the dual KHU outages when the penstock is dewatered. • LCT and Central Switchyard will be protected. • The other LCT will be protected and available within one hour. • Prior to the start of the outage, verify a Jocassee Hydro Unit is available to be aligned to the Oconee 230-kV Yellow Bus in approximately one hour. • Temporary diesel generator will be located at Keowee Hydro Station with the capability to restore the available KHU unit to operable status within 4 hours from dual KHU outage. • Reduced Reactor Coolant System Inventory will not be permitted during dual KHU outage. • FLEX equipment will be available. • PSW System will be available available and with power system capable of aligning the Fant 100-kV line or a KHU to the SSF. 	
4	The licensee will not use the second Completion Time for Required Action C.2.2.5 for planned Keowee work prior to the Keowee generator stator outage for each KHU.	Ongoing until KHU generator outages complete.

In its letter dated October 13, 2017, the licensee provided the following regulatory commitments:

	Commitment	Completion Date
1	The drop lines to CT2 will be replaced in the upcoming Unit 2 Fall 2017 outage.	Fall 2017 outage
2	The operator rounds inspection will be performed on the drop lines for startup transformers without an Open Phase Protection (OPP) system just prior to entering dual KHU outages associated with each stator replacement. This visual inspection will be performed on each shift (day and night) for the duration of the dual KHU outages. The frequency of inspections will be increased to twice per shift should severe weather occur during the dual KHU outage.	Prior to and during dual KHU stator outage work.

The staff reviewed these actions and concluded that they effectively manage the resulting increase in risk by the performance of the KHU stator replacements per 10 CFR 50.65(a)(4). The staff concludes that the above risk reduction measures represent reasonable controls for the implementation of the proposed changes and, therefore, are acceptable risk mitigation strategies to be implemented per 10 CFR 50.65(a)(4) by the licensee during the KHU stator replacement. The staff also concludes that reasonable controls for the implementation and for subsequent evaluation of potential changes to these regulatory commitments are best provided by the licensee’s administrative processes, including its commitment management program. These regulatory commitments do not warrant the creation of regulatory requirements requiring prior NRC approval of subsequent changes.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the staff notified the State of South Carolina officials (i.e., Ms. Susan Jenkins, Manager, Infectious and Radioactive Waste Management; and Mr. Mark Yeager, Manager, Environmental Health, of the South Carolina Department of Health and Environmental Control) on May 10, 2017,⁷ of the proposed issuance of the amendments. The State officials had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding, which was published in the *Federal Register* on July 5, 2016 (81 FR 43650). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

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

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Date: November 20, 2017.

⁷ Koenick, Steven, U.S. Nuclear Regulatory Commission, e-mail to Susan E. Jenkins and Mark A. Yeager, Bureau of Land & Waste Management, May 10, 2017, ADAMS Accession No. ML17199A117.

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 – ISSUANCE OF AMENDMENTS REGARDING THE TECHNICAL SPECIFICATIONS FOR ELECTRICAL POWER SYSTEMS (CAC NOS. MF7417, MF7418, AND MF7419; EPID NO. L-2016-LLA-0002) DATED NOVEMBER 20, 2017

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DATE	11/15/17	11/17/17	11/20/17	

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