



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

June 6, 2000

Mr. William R. McCollum, Jr.  
Vice President, Oconee Site  
Duke Energy Corporation  
7800 Rochester Highway  
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2 AND 3 - ISSUANCE OF  
AMENDMENTS RE: KEOWEE VOLTAGE AND FREQUENCY PROTECTION  
(TAC NOS. MA6157, MA6158, AND MA6159)

Dear Mr. McCollum:

The Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 312 ,  
312 , and 312 to Facility Operating Licenses DPR-38, DPR-47, and DPR-55,  
respectively, for the Oconee Nuclear Station, Units 1, 2, and 3. The amendments consist of  
changes to the Technical Specifications in response to your application dated July 27, 1999,  
as supplemented by letters dated October 7, 1999, and May 31, 2000.

The amendments add a surveillance requirement to verify the Keowee out-of-tolerance logic  
trips and blocks closure of the appropriate overhead or underground power path breakers. This  
logic is being added as part of a modification to provide voltage and frequency protection for the  
Keowee hydro units for protection from out-of-tolerance voltage and frequency transients. We  
request that you inform the staff by letter when these amendments have been implemented.

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

Sincerely,

David E. LaBarge, Senior Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

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

Enclosures:

1. Amendment No. 312 to DPR-38
2. Amendment No. 312 to DPR-47
3. Amendment No. 312 to DPR-55
4. Safety Evaluation

cc w/encls: See next page

June 6, 2000

Mr. William R. McCollum, Jr.  
Vice President, Oconee Site  
Duke Energy Corporation  
P. O. Box 1439  
Seneca, SC 29679

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/RA/

David E. LaBarge, Senior Project Manager, Section 1  
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Office of Nuclear Reactor Regulation

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

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cc w/encls: See next page

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To receive a copy of this document, indicate in the box C=Copy w/o attachment/enclosure E=Copy with attachment/enclosure N = No  
copy \*See previous concurrence

OFFICE	PDII-1/PM	PDII-1/LA	EEIB*	OGC*	PDII-1/SC
NAME	DLaBarge:cn	CHawes	JCalvo	RWeisman	REmch
DATE	6 / 1 / 2000	6 / 1 / 2000	3 / 30 / 2000	4 / 25 / 2000	6 / 2 / 2000

OFFICIAL RECORD COPY

Oconee Nuclear Station

cc:

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

DUKE ENERGY CORPORATION

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.312  
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) Facility Operating License No. DPR-38 filed by the Duke Energy Corporation (the licensee) dated July 27, 1999, as supplemented October 7, 1999, and May 31, 2000, 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 page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of 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. 312, 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 by November 30, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: June 6, 2000



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

DUKE ENERGY CORPORATION

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 312  
License No. DPR-47

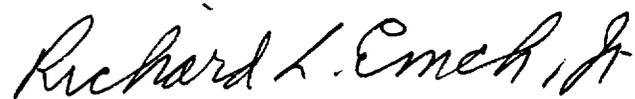
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility) Facility Operating License No. DPR-47 filed by the Duke Energy Corporation (the licensee) dated July 27, 1999, as supplemented October 7, 1999, and May 31, 2000, 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 page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of 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. 312 , 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 by November 30, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: June 6, 2000



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

DUKE ENERGY CORPORATION

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 312  
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) Facility Operating License No. DPR-55 filed by the Duke Energy Corporation (the licensee) dated July 27, 1999, as supplemented October 7, 1999, and May 31, 2000, 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 page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of 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. 312 , 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 by November 30, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: June 6, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 312

FACILITY OPERATING LICENSE NO. DPR-38

DOCKET NO. 50-269

AND

TO LICENSE AMENDMENT NO. 312

FACILITY OPERATING LICENSE NO. DPR-47

DOCKET NO. 50-270

AND

TO LICENSE AMENDMENT NO. 312

FACILITY OPERATING LICENSE NO. DPR-55

DOCKET NO. 50-287

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

TS LEOP1  
TS LEOP7  
BASES LEOP1  
BASES LEOP13  
BASES LEOP14  
3.8.1-17  
B 3.8.1-4  
B 3.8.1-5  
B 3.8.1-25  
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Insert

TS LEOP1  
TS LEOP7  
BASES LEOP1  
BASES LEOP13  
BASES LEOP14  
3.8.1-17  
B 3.8.1-4  
B 3.8.1-5  
B 3.8.1-25  
B 3.8.1-26

OCONEE NUCLEAR STATION  
TECHNICAL SPECIFICATIONS  
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LOEP2	300/300/300	12/16/98
LOEP3	304/304/304	04/28/99
LOEP4	309/309/309	1/18/00
LOEP5	300/300/300	12/16/98
LOEP6	309/309/309	1/18/00
LOEP7	312/312/312	06/06/00
LOEP8	310/310/310	1/18/00
LOEP9	310/310/310	1/18/00
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1.2-1	300/300/300	12/16/98
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1.3-1	300/300/300	12/16/98
1.3-2	300/300/300	12/16/98
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1.3-7	300/300/300	12/16/98
1.3-8	300/300/300	12/16/98
1.3-9	300/300/300	12/16/98
1.3-10	300/300/300	12/16/98
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1.4-2	300/300/300	12/16/98
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1.4-4	300/300/300	12/16/98
2.0-1	306/306/306	9/24/99

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3.8.2-4	300/300/300	12/16/98
3.8.3-1	300/300/300	12/16/98
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3.8.3-4	300/300/300	12/16/98
3.8.4-1	300/300/300	12/16/98
3.8.4-2	300/300/300	12/16/98
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3.8.7-1	300/300/300	12/16/98
3.8.7-2	300/300/300	12/16/98
3.8.8-1	300/300/300	12/16/98
3.8.8-2	300/300/300	12/16/98
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3.9.1-1	300/300/300	12/16/98
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3.9.3-1	303/303/303	04/28/99

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LOEP5	BASES REVISION	06/02/99
LOEP6	309/309/309	1/18/00
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LOEP9	BASES REVISION	12/10/99
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LOEP15	BASES REVISION	01/31/00
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LOEP17	BASES REVISION	12/16/98
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iii	309/309/309	1/18/00
iv	309/309/309	1/18/00
B 2.1.1-1	300/300/300	12/16/98
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B 2.1.1-3	300/300/300	12/16/98
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B 3.8.1-15	300/300/300	12/16/98
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OCONEE NUCLEAR STATION  
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B 3.8.2-3	300/300/300	12/16/98
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B 3.8.4-4	300/300/300	12/16/98

6/6/00

BASES

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LCO  
(continued)

An OPERABLE KHU and its required overhead emergency power path must be capable of automatically supplying power from the KHU through the KHU main step-up transformer, the 230 kV yellow bus, the Unit startup transformer and both E breakers to both main feeder buses. At least one channel of switchyard isolation (by actuation from degraded grid voltage protection) is required to be OPERABLE to isolate the 230 kV switchyard yellow bus. If closed, each N breaker must be capable of opening using either of its associated breaker trip circuits. Either of the following combinations provides an acceptable KHU and required overhead emergency power path:

Keowee Hydro Unit

- 1A) Keowee Unit 1 generator,
- 2A) Keowee ACB 1 (enabled by one channel of Switchyard Isolate Complete),
- 3A) Keowee auxiliary transformer 1X, Keowee ACB 5, Keowee Load Center 1X,
- 4A) Keowee MCC 1XA,
- 5A) Keowee Battery #1, Charger #1 or Standby Charger, and Distribution Center 1DA,
- 6A) ACB-1 to ACB-3 interlock,
- 7A) Keowee Unit 1 Voltage and Frequency out of tolerance (OOT) logic
- 8) Keowee reservoir level  $\geq$  775 feet above sea level,

Keowee Hydro Unit

- 1B) Keowee Unit 2 generator,
- 2B) Keowee ACB 2 (enabled by one channel of Switchyard Isolate Complete),
- 3B) Keowee auxiliary transformer 2X, Keowee ACB 6, Keowee Load Center 2X,
- 4B) Keowee MCC 2XA,
- 5B) Keowee Battery #2, Charger #2 or Standby Charger, and Distribution Center 2DA,
- 6B) ACB-2 to ACB-4 interlock,
- 7B) Keowee Unit 2 Voltage and Frequency out of tolerance (OOT) logic

Overhead Emergency Power Path

- 9) Keowee main step-up transformer,
- 10) PCB 9 (enabled by one channel of Switchyard Isolate Complete),
- 11) The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate,
- 12) A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30), and
- 13) Both E breakers.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16</p> <p>-----NOTE----- Only applicable when complying with Required Action C.2.2.4. -----</p> <p>Verify one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path.</p>	<p>As specified by Required Action C.2.2.4</p>
<p>SR 3.8.1.17</p> <p>Verify each KHU's Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers. The allowable values with a time delay of 12 seconds <math>\pm</math> 1 second shall be as follows:</p> <ul style="list-style-type: none"> <li>a. Undervoltage <math>\geq</math> 12.42 kV and <math>\leq</math> 12.63 kV</li> <li>b. Overvoltage <math>\geq</math> 14.90 kV and <math>\leq</math> 15.18 kV</li> <li>c. Underfrequency <math>\geq</math> 53.992 hz and <math>\leq</math> 54.008 hz</li> <li>d. Overfrequency <math>\geq</math> 65.992 hz and <math>\leq</math> 66.008 hz</li> </ul>	<p>18 months</p>

BASES

LCO  
(continued)

An OPERABLE KHU and its required underground emergency power path must be capable of automatically supplying power from the KHU through the underground feeder, transformer CT-4, both standby buses, and both Unit S breakers to both main feeder buses. If closed, each N breaker and each SL breaker must be capable of opening using either of its associated breaker trip circuits. Either of the following combinations provides an acceptable KHU and required underground emergency power path:

<u>Keowee Hydro Unit</u>	<u>Keowee Hydro Unit</u>
1A) Keowee Unit 1 generator,	1B) Keowee Unit 2 generator,
2A) Keowee ACB 3,	2B) Keowee ACB 4,
3A.1) Keowee auxiliary transformer CX, Keowee ACB 7, Keowee Load Center 1X,	3B.1) Keowee auxiliary transformer CX, Keowee ACB 8, Keowee Load Center 2X,
3A.2) One Oconee Unit 1 S breaker capable of feeding switchgear 1TC,	3B.2) One Oconee Unit 1 S breaker capable of feeding switchgear 1TC,
3A.3) Switchgear 1TC capable of feeding Keowee auxiliary transformer CX,	3B.3) Switchgear 1TC capable of feeding Keowee auxiliary transformer CX,
4A) Keowee MCC 1XA,	4B) Keowee MCC 2XA,
5A) Keowee Battery #1, Charger #1 or Standby Charger, and Distribution Center 1DA,	5B) Keowee Battery #2, Charger #2 or Standby Charger, and Distribution Center 2DA,
6A) ACB-1 to ACB-3 interlock,	6A) ACB-2 to ACB-4 interlock,
7A) Keowee Unit 1 Voltage and Frequency OOT logic	7B) Keowee Unit 2 Voltage and Frequency OOT logic
8) Keowee reservoir level $\geq$ 775 feet above sea level,	

Underground Emergency Power Path

- 9) The underground feeder,
- 10) Transformer CT-4,
- 11) Both SK breakers,
- 12) Both standby buses,
- 13) Both S breakers, and
- 14) ACB-3 to ACB-4 interlock.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.16 (continued)

OPERABLE. When the overhead emergency power path is inoperable, the SR verifies by administrative means that the KHU associated with the overhead emergency power path is OPERABLE.

This SR is modified by a Note indicating that the SR is only applicable when complying with Required Action C.2.2.4.

SR 3.8.1.17

This SR verifies the Keowee Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers on an out of tolerance trip signal. The 18 month Frequency is based on engineering judgement and provides reasonable assurance that the Voltage and Frequency out of tolerance logic trips and blocks closure of these breakers when required.

There are three over voltage relays, three under voltage relays, and three over/under frequency relays per KHU with each relay actuating an auxiliary relay used to provide two out of three logic. These relays monitor generator output voltage and if two phases are above/below setpoint, prevent the power path breakers from closing or if closed, provide a trip signal which is applied after a time delay, to open the power path breakers. Testing demonstrates that relays actuate at preset values, that timers time out and that two under voltage relays, two over voltage relays, or two over/under frequency relays will actuate the logic channel. This ensures that the power path breakers will not close and if closed, will trip after a preset time delay.

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REFERENCES

1. UFSAR, Section 3.1.39
2. UFSAR, Chapter 16
3. 10 CFR 50.36
4. UFSAR, Chapter 6
5. UFSAR, Chapter 15
6. Regulatory Guide 1.32
7. Regulatory Guide 1.129

BASES

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- REFERENCES  
(continued)
- 8. IEEE-450-1980
  - 9. UFSAR, Section 6.3.3.3
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 312 TO FACILITY OPERATING LICENSE DPR-38

AMENDMENT NO. 312 TO FACILITY OPERATING LICENSE DPR-47

AND AMENDMENT NO. 312 TO FACILITY OPERATING LICENSE DPR-55

DUKE ENERGY CORPORATION

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

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

1.0 INTRODUCTION

By letter dated July 27, 1999, as supplemented October 7, 1999, and May 31, 2000, Duke Energy Corporation (the licensee) submitted a request for changes to the Oconee Nuclear Station, Units 1, 2, and 3, Technical Specifications (TS). The requested changes would add a surveillance requirement to verify operability of new logic that will generate Keowee out-of-tolerance (OOT) logic trips to block closure of the appropriate overhead or underground power path breakers. The surveillance also verifies that the OOT logic will trip the same breakers following a time delay if they are closed. This logic is being added as part of a modification to provide voltage and frequency protection for the Keowee hydro units to protect them from being exposed to OOT voltage and frequency transients. The supplements dated October 7, 1999, and May 31, 2000, provided clarifying information that did not change the scope of the July 27, 1999, application and the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The design of the Oconee ac electrical power system includes two pathways from the Keowee hydroelectric generators that are capable of supplying emergency power to each unit- one through an underground pathway and the other through the site switchyard. Each pathway has sufficient capacity to supply power from the two Keowee hydroelectric generators to the entire complement of each unit's emergency buses, as well as a large complement of non-safety equipment (including reactor coolant pumps). The equipment that would be energized depends on the scenario, the emergency power source, and the emergency power pathway (underground or overhead line) that is available. Consequently, should a malfunction of a Keowee voltage regulator or governor cause an OOT voltage or frequency condition to occur when Keowee is energizing the bus, the entire complement of redundant safety equipment that is connected to that source would be exposed to that voltage and frequency. If great enough, this OOT condition could lead to equipment damage, degraded equipment, or other undesirable consequences. This concern was expressed in the staff's Interim Report that was issued on March 17, 1998, and in its Final Report that was issued in January 1999, on the Oconee Emergency Electrical Power System.

### 3.0 EVALUATION

The modification proposed by the licensee will add over and under voltage and frequency protection on each of the two Keowee units by adding logic in the controls of the Keowee Overhead Power Path Breakers to the switchyard (ACB-1 and ACB-2) and the Underground Power Path Breakers to the Oconee emergency buses (SK-1 and SK-2). The new sensing circuit will consist of three overvoltage, three undervoltage, and three over/under frequency relays connected to monitor the output terminals of each Keowee generator. If an OOT condition (10 percent above or below the nominal voltage and frequency setpoint) is detected on two phases of the generator output terminals, the relays will generate a trip signal after a time delay that will open the associated power path breakers if they are closed and block their closure if they are open. Sliding links, test switches, and indicating lights will be used for testing the logic without actually tripping the breakers. The licensee has determined that the modification does not have any adverse affects on the current function of the Keowee generators to supply emergency power within 23 seconds of receiving an emergency start signal or on the Keowee single failure design.

The licensee has proposed TS Surveillance Requirement 3.8.1.17 to implement the testing requirements necessary to verify operability of the new Keowee logic on an 18-month frequency. In addition, when the logic is inoperable, the affected Keowee unit and its emergency power path will be considered to be inoperable. The testing is designed to demonstrate that the relays actuate at the preset values, timers time out as expected, and the voltage and frequency relays actuate the logic channel as expected. The licensee has also proposed adding the voltage and frequency OOT logic to the list of equipment in the Limiting Condition for Operation Bases that must be operable for the Keowee unit to be considered operable.

The proposed upper and lower limits for each voltage, frequency, and timer allowable value were chosen by the licensee as follows:

- a. Undervoltage:  $\geq 12.42$  kV and  $\leq 12.63$  kV
- b. Overvoltage:  $\geq 14.90$  kV and  $\leq 15.18$  kV
- c. Underfrequency:  $\geq 53.992$  hz and  $\leq 54.008$  hz
- d. Overfrequency:  $\geq 65.992$  hz and  $\leq 66.008$  hz
- e. Timer: 12 seconds  $\pm$  1 second

The following discussion describes how the licensee chose the analytical values that were used to derive the above allowable value limits.

The existing circuitry at Keowee that is associated with load rejection scenarios uses overfrequency relays set at 10 percent above nominal. The high setpoint is based on acceptable overfrequency that Oconee and Keowee loads can tolerate when connected to an overspeeding, but decelerating, Keowee generator. This frequency has been established at 110 percent. This circuitry was evaluated as acceptable in Oconee Nuclear Station, Units 1, 2, and 3, Amendment Nos. 210, 210, and 207, respectively, that were issued on August 15, 1995.

One factor in the design of the Keowee OOT logic was to minimize the number of new components added to the Keowee units logic. The licensee accomplished this by using the existing circuitry described above and adding voltage relays.

Electrical equipment is manufactured to operate normally within  $\pm 10$  percent of nominal voltage. Therefore, voltage setpoints were established by the licensee at 90 percent to 110 percent on the new and existing relays.

If a Keowee unit overspeeds as a result of load rejection, it can be demonstrated that if Keowee and Oconee auxiliaries are energized when speed decreases to 110 percent, the resultant current/time parameters are such that the actuation of safety-related protective devices will not occur. In addition, the required motors will start and perform their design functions during all design basis events that require their automatic operation. This provides the licensee's basis for the short term overfrequency protection aspect of the OOT logic.

The basis for settings is also relative to various industry standards that establish threshold values of voltage and frequency at which various motors will operate continuously. Industry documentation provides discussion on the effects of  $\pm 5$  percent frequency and  $\pm 10$  percent voltage variations, which has shown that equipment can operate outside these values without damage for short periods of time.

In anticipation of OOT frequency problems, a computer alarm is added with this modification that will alarm when the frequency is out of tolerance by  $\pm 5$  percent. This will allow the operator to respond prior to the OOT condition to return the unit to nominal values. This feature of the design addresses longer term overfrequency and underfrequency conditions.

After loading, should an OOT condition exist on a unit, its overhead or underground breaker will trip after a time delay. The basis for the time delay is to allow time to override transients and normal expected speed overshoots on emergency start. The time delay is also minimized to limit the exposure of Oconee loads to OOT conditions.

The Keowee generators are emergency power sources that must have a high degree of availability when called upon. Given this, the staff finds that the above analytical limits chosen by the licensee provide a reasonable balance between protecting redundant safety equipment and avoiding unnecessary trips of the Keowee emergency generators. The staff concludes, therefore, that the proposed changes to the Keowee logic scheme results in enhanced protection of safety equipment and a low risk of undesired trips.

In response to the staff's request for additional information dated August 30, 1999, the licensee described the uncertainties used to develop the setpoints and allowable values for the OOT protection in a letter dated October 7, 1999. These calculations took into consideration loop uncertainties, repeatability over the allowable voltage and temperature ranges, transmitter accuracy, test equipment tolerance, setpoint tolerance, relay drift, environment, hysteresis (dead band) between reset and setpoints, and the cutoff feature that blocks operation of the relay when AC input is below the factory setpoint. The staff has reviewed this information and finds that the uncertainties consideration by the licensee is acceptable.

(dead band) between reset and setpoints, and the cutoff feature that blocks operation of the relay when AC input is below the factory setpoint. The staff has reviewed this information and finds that the uncertainties consideration by the licensee is acceptable.

#### 4.0 SUMMARY

The surveillance requirement to test the OOT relay logic associated with the Keowee output breakers has been proposed by the licensee to support the OOT modification and ensure that the logic is operable. The tests will verify that the breakers will close when the voltage and frequency are within their allowable values, do not close when out of the allowable value range, and will open automatically following a set time delay if an OOT condition occurs.

Based on the information provided by the licensee, the staff has determined that the additional surveillance tests are necessary and adequate to ensure that the OOT relay logic is operable and if proven to be inoperable, the specified action to declare the associated Keowee unit inoperable is appropriate. The staff has reviewed the proposed setpoints and ranges and found them, and the related Bases changes, to be satisfactory. Therefore, the staff finds that the proposed TS change is acceptable.

#### 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the South Carolina State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 6.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. 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 (64 FR 46429). 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) 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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