

ATTACHMENT 1

TECHNICAL SPECIFICATION

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16 -----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 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 shall be as follows:</p> <ul style="list-style-type: none"> <li>a. Undervoltage <math>\geq</math> 12.42 kV</li> <li>b. Overvoltage <math>\leq</math> 15.18 kV</li> <li>c. Underfrequency <math>\geq</math> 54 hz</li> <li>d. Overfrequency <math>\leq</math> 66 hz</li> </ul>	<p>18 months</p>

BASES

LCO  
(continued)

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:

- | <u>Keowee Hydro Unit</u>   | <u>Keowee Hydro Unit</u>   |
|--|--|
| 1A) Keowee Unit 1 generator,   | 1B) Keowee Unit 2 generator,   |
| 2A) Keowee ACB 1 (enabled by one channel of Switchyard Isolate Complete),          | 2B) Keowee ACB 2 (enabled by one channel of Switchyard Isolate Complete),          |
| 3A) Keowee auxiliary transformer 1X, Keowee ACB 5, Keowee Load Center 1X,          | 3B) Keowee auxiliary transformer 2X, Keowee ACB 6, Keowee Load Center 2X,          |
| 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,  | 6B) ACB-2 to ACB-4 interlock,  |
| 7A) Keowee Unit 1 Voltage and Frequency out of tolerance (OOT) logic               | 7B) Keowee Unit 2 Voltage and Frequency out of tolerance (OOT) logic               |
| 8) Keowee reservoir level $\geq$ 775 feet above sea level,                         |  |

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.

(continued)

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,  | 6B) 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.

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.15 (continued)

and minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard.

SR 3.8.1.16

This SR verifies by administrative means that 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. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies by administrative means that the overhead emergency power path is 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.

(continued)

BASES

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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
  8. IEEE-450-1980
  9. UFSAR, Section 6.3.3.3
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(continued)

ATTACHMENT 2  
TECHNICAL SPECIFICATION MARKUP

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16 -----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>

INSERT 3.8.1-17A



INSERT 3.8.1-17A

<p>SR 3.8.1.17 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 shall be as follows:</p> <ul style="list-style-type: none"><li>a. Undervoltage <math>\geq</math> 12.42 kV</li><li>b. Overvoltage <math>\leq</math> 15.18 kV</li><li>c. Underfrequency <math>\geq</math> 54 hz</li><li>d. Overfrequency <math>\leq</math> 66 hz</li></ul>	<p>18 months</p>
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BASES

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:

- | <u>Keowee Hydro Unit</u>   | <u>Keowee Hydro Unit</u>   |
|--|--|
| 1A) Keowee Unit 1 generator,   | 1B) Keowee Unit 2 generator,   |
| 2A) Keowee ACB 1 (enabled by one channel of Switchyard Isolate Complete),          | 2B) Keowee ACB 2 (enabled by one channel of Switchyard Isolate Complete),          |
| 3A) Keowee auxiliary transformer 1X, Keowee ACB 5, Keowee Load Center 1X,          | 3B) Keowee auxiliary transformer 2X, Keowee ACB 6, Keowee Load Center 2X,          |
| 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,  | 6B) ACB-2 to ACB-4 interlock,  |
| 8-7) Keowee reservoir level $\geq$ 775 feet above sea level,                       |  |

Overhead Emergency Power Path

- 9-8) Keowee main step-up transformer,
- 10-9) PCB 9 (enabled by one channel of Switchyard Isolate Complete),
- 11-10) The 230kV switchyard yellow bus capable of being isolated by one channel of Switchyard Isolate,
- 12-11) A unit startup transformer and associated yellow bus PCB (CT-1 / PCB 18, CT-2 / PCB 27, CT-3 / PCB 30), and
- 13-12) Both E breakers.

7A) Keowee Unit 1 Voltage and Frequency out of tolerance (OOT) logic.  
7B) Keowee Unit 2 Voltage and Frequency out of tolerance (OOT) logic.

(continued)

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:

Keowee Hydro Unit

- 1A) Keowee Unit 1 generator,
- 2A) Keowee ACB 3,
- 3A.1) Keowee auxiliary transformer CX, Keowee ACB 7, Keowee Load Center 1X,
- 3A.2) One Oconee Unit 1 S breaker capable of feeding switchgear ITC,
- 3A.3) Switchgear ITC capable of feeding Keowee auxiliary transformer CX,
- 4A) Keowee MCC 1XA,
- 5A) Keowee Battery #1, Charger #1 or Standby Charger, and Distribution Center 1DA,
- 6A) ACB-1 to ACB-3 interlock,
- 8-7)

Keowee Hydro Unit

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

7A) Keowee Unit 1 Voltage and Frequency OOT logic  
7B) Keowee Unit 2 Voltage and Frequency OOT logic

Underground Emergency Power Path

- 9-8) The underground feeder,
- 10-9) Transformer CT-4,
- 11-10) Both SK breakers,
- 12-11) Both standby buses,
- 13-12) Both S breakers, and
- 14-13) ACB-3 to ACB-4 interlock.

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.15 (continued)

and minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard.

SR 3.8.1.16

This SR verifies by administrative means that 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. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies by administrative means that the overhead emergency power path is 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.

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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
8. IEEE-450-1980
9. UFSAR, Section 6.3.3.3

INSERT  
B 3.8.1-27A

INSERT B 3.8.1-27A

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.

### Attachment 3

## Technical Justification

### Background

A modification is being implemented to modify the voltage and frequency protection on each Keowee unit to include over and under voltage and frequency protection. Logic will be provided in the controls of the Keowee Overhead Power Path breakers ACB-1 & ACB-2 and Underground Power Path breakers SK-1 & SK-2 such that the effects of postulated out of tolerance voltage and frequency are precluded. The new sensing logic will consist of a 27N (under voltage relay), 59N (over voltage relay) and an 81 (under and over frequency relay) that monitors each phase of the generator output terminals and energizes a network of 2 out of 3 relay logic when an out of tolerance condition exists. The sensing relays will be set at +/-10% of nominal voltage and frequency. Sliding links, test switches and indicating lights will be provided to allow testing of the new 2 out of 3 circuit logic. Duke committed to provide protection for out of tolerance (OOT) voltage and frequency on the Keowee generators to further improve the design in response to NRC draft and final reports with concerns about redundant safety equipment of the three Oconee units being exposed to out of tolerance voltage or frequency from a Keowee voltage regulator or governor failure. Implementation of this modification necessitates a change to Technical Specification 3.8.1.

### Description of the Technical Specification Change

SR 3.8.1.17 is added to require verifying the Keowee out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers on an 18 month frequency. The LCO Bases for the KHUS is modified to include the

OOT logic as part of the overhead and underground emergency power path. As such, when the OOT logic is inoperable, the affected KHU and its required emergency power path are inoperable.

### Technical Justification

The Keowee Hydro units and their role in the Oconee emergency power system currently meet the design/licensing basis requirements for the system. The proposed change supports testing of the Keowee OOT voltage and frequency protection logic. Installation of the OOT logic fulfills a commitment to the NRC in response to concerns from the drafts and final Emergency Power Report. The proposed change does not affect the current function of the Keowee Hydro Units; however, it does affect the equipment that supports operability of the Keowee units. This support equipment (OOT logic) is added to the LCO Bases as a condition for OPERABILITY of the Keowee units. A Surveillance Requirement is added to demonstrate OPERABILITY on an 18 month frequency. An 18 month test Frequency is considered appropriate per Engineering judgement. Engineering judgement is based on industry standards, regulatory standards, and equipment that is similar in design, function and reliability to equipment tested by SR 3.3.17.1, SR 3.3.18.1, SR 3.8.1.14, SR 3.8.1.15 and ITS 5.5.18. The proposed change does not affect the current function of the Keowee Hydro Units. The proposed change does not cause any adverse effects to Keowee's ability to supply power within 23 seconds or the Keowee single failure design.

**Attachment 4**

**No Significant Hazards Determination**

Pursuant to 10 CFR 50.91, Duke Power Company (Duke) has made the determination that this amendment request involves a No Significant Hazards Consideration by applying the standards established by the NRC regulations in 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated:

This change does not create any conditions or events, which lead to accidents previously, evaluated in the SAR. The Keowee Hydro units are used for mitigation of loss of power scenarios. The proposed changes do not change the current function of the Keowee Hydro Units. Therefore, the proposed change does not involve a significant increase in the probability of an accident previously evaluated. The Keowee Hydro units and their role in the Oconee emergency power system currently meet the design/licensing basis requirements for the system. There is no adverse affect on containment integrity and no new release paths are created. The proposed changes do not cause any adverse effects to the Keowee single failure design or adversely affect the Keowee start time of 23 seconds. Therefore, the proposed changes do not involve a significant increase in the consequences of an accident previously evaluated.

- (2) Create the possibility of a new or different kind of accident from any kind of accident previously evaluated:

The Keowee Hydro units are used for mitigation of loss of power scenarios. No accidents new or different than already evaluated in the SAR are postulated as a result of the



proposed change. No setpoints for parameters, which initiate protective or mitigative action, are being changed. Therefore, this proposed amendment does not create the possibility of any new or different kind of accident.

(3) Involve a significant reduction in a margin of safety.

The proposed change does not adversely affect any plant safety limits, set points, or design parameters. The change also does not adversely affect the fuel, fuel cladding, Reactor Coolant System, or containment integrity. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Duke has concluded, based on the above, that there are no significant hazards considerations involved in this amendment request.

**Attachment 5**

**Environmental Assessment**

Pursuant to 10 CFR 51.22(b), an evaluation of the license amendment request (LAR) has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c)9 of the regulations. The LAR does not involve:

- 1) A significant hazards consideration.

This conclusion is supported by the determination of no significant hazards contained in Attachment 4.

- 2) A significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

This LAR will not change the types or amounts of any effluents that may be released offsite.

- 3) A significant increase in the individual or cumulative occupational radiation exposure.

This LAR will not increase the individual or cumulative occupational radiation exposure.

In summary, this LAR meets the criteria set forth in 10 CFR 51.22 (c)9 of the regulations for categorical exclusion from an environmental impact statement.