



**Scott L. Batson**  
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10 CFR 50.90

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April 26, 2013

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555-0001

Subject: Duke Energy Carolinas, LLC  
Oconee Nuclear Station (ONS), Units 1, 2 and 3  
Docket Number 50-269, 50-270 and 50-287  
License Amendment Request to add Keowee Hydro Unit (KHU) Steady State  
Frequency Requirements  
License Amendment Request (LAR) No. 2013-01

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) proposes to amend the Technical Specifications (TSs) of Renewed Facility Operating License Nos. DPR-38, DPR-47 and DPR-55 to add steady state frequency requirements for the emergency power sources, KHUs, at ONS. Acceptable KHU steady-state limits, which have been determined to be -1% to +3% nominal frequency (59.4 Hz to 61.8 Hz), are currently controlled by a Selected Licensee Commitment (SLC). Duke Energy proposes to add a surveillance requirement to ONS TSs to verify these requirements are met.

The enclosure provides an evaluation of the proposed TS change. Regulatory evaluation (including the significant hazards consideration) and environmental considerations are provided in Sections 5 and 6 of the enclosure. Attachment 1 provides marked up TS and TS Bases pages. Attachment 2 provides retyped TS and TS Bases pages.

In accordance with Duke Energy administrative procedures that implement the Quality Assurance Program Topical Report, these proposed changes have been reviewed and approved by the Plant Operations Review Committee. A copy of this LAR is being sent to the State of South Carolina in accordance with 10 CFR 50.91 requirements.

Duke Energy requests approval of this amendment request by April 30, 2014. Once approved, the amendment will be implemented within 30 days. Duke Energy will also update applicable sections of the ONS Updated Final Safety Analysis Report (UFSAR), as necessary, and submit these per 10 CFR 50.71(e). There are no new commitments being made as a result of the proposed change.

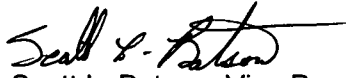
Inquiries on this proposed amendment request should be directed to Boyd Shingleton, ONS Regulatory Affairs Group, at (864) 873-4716.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on  
April 26, 2013.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott L. Batson", with a stylized flourish at the end.

Scott L. Batson, Vice President,  
Oconee Nuclear Station

Enclosure and Attachments:

Enclosure	Evaluation of the proposed changes
Attachment 1	Marked up TS and TS Bases pages
Attachment 2	Retyped TS and TS Bases pages

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cc w/enclosure and attachments:

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## **ENCLOSURE**

### **EVALUATION OF PROPOSED CHANGES**

Subject: Proposed License Amendment Request to add Keowee Steady State Frequency Requirements

1. SUMMARY DESCRIPTION
2. BACKGROUND
3. DETAILED DESCRIPTION OF PROPOSED CHANGES
4. TECHNICAL EVALUATION
5. REGULATORY EVALUATION
6. ENVIRONMENTAL CONSIDERATION

## **1 SUMMARY DESCRIPTION**

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) proposes to amend the Technical Specifications (TSs) to add steady state frequency requirements for the emergency power sources, Keowee Hydro Units (KHUs), at Oconee Nuclear Station (ONS). Acceptable Keowee Hydro Unit (KHU) steady state limits, which have been determined to be -1% to +3% nominal frequency (59.4 Hz to 61.8 Hz), are currently controlled by a Selected Licensee Commitment (SLC). Duke Energy proposes to add a surveillance requirement to ONS TSs to verify these requirements are met.

A detailed description of the proposed change is provided in Section 3. An evaluation of the proposed change is provided in Section 4. The marked up and revised TS and TS Bases pages are provided in Attachments 1 and 2, respectively.

Duke Energy requests approval of this amendment request by April 30, 2014. Once approved, the amendment will be implemented within 30 days. There are no new commitments being made as a result of this proposed change.

## **2 BACKGROUND**

The ONS AC Power System consists of the offsite power sources (preferred power) and the onsite emergency power sources, KHUs. This system is designed to supply the required Engineered Safeguards (ES) loads of one unit and safe shutdown loads of the other two units and is so arranged that no single failure can disable enough loads to jeopardize plant safety. The design of the AC Power System provides independence and redundancy to ensure an available source of power to the ES systems.

The Keowee Hydro Station contains two units rated 87,500 kVA each, which generate at 13.8 kV. The KHU turbine generators are powered through a common intake by water taken from Lake Keowee. Upon loss of power from the Oconee generating unit and 230 kV switchyard, power is supplied from both KHUs through two separate and independent routes. The underground emergency power path is from one KHU through the underground feeder circuit, transformer CT-4, the CT-4 incoming breakers (SK breakers), standby bus and the standby breakers (S breakers). The overhead emergency power path is from the other KHU through the startup transformer and the startup incoming breakers (E breakers).

The standby buses can also receive power from either one of two combustion turbine generators at the Lee Steam Station through a dedicated 100 kV transmission line, transformer CT-5, and both CT-5 incoming breakers (SL breakers). The 100 kV transmission line can be supplied from a Lee combustion turbine (LCT) and electrically separated from the system grid and offsite loads.

### 3 DETAILED DESCRIPTION OF PROPOSED CHANGES

Duke Energy proposes to modify the Technical Specifications and Technical Specification Bases (for information only). The proposed changes are listed below:

#### TS Surveillance Requirement (SR) 3.8.1.9

Add SR 3.8.1.9.b to SR 3.8.1.9 to require steady state frequency be verified at the same 12-month frequency as SR 3.8.1.9.a and locate that frequency in the Surveillance Frequency Control Program (SFCP) consistent with SR 3.8.1.9.a. The existing SR 3.8.1.9.b is renumbered to SR 3.8.1.9.c. The modified SR requirement is re-stated below:

Verify on an actual or simulated emergency actuation signal each KHU auto starts and:

- a. Achieves frequency  $\geq 57$  Hz and  $\leq 63$  Hz and voltage  $\geq 13.5$  kV and  $\leq 14.49$  kV in  $\leq 23$  seconds;
- b. Achieves steady state frequency  $\geq 59.4$  Hz and  $\leq 61.8$  Hz; and
- c. Supplies the equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when synchronized to system grid and loaded at maximum practical rate.

NRC recently approved an amendment (Amendment Nos. 372, 374, & 373) that allowed ONS to relocate certain SR frequencies (as allowed by Technical Specification Task Force (TSTF) 425) to a SFCP. The change allows ONS to change SR frequencies without NRC approval based on an approved method. TSTF 425 allows SR frequencies that are of a fixed frequency to be relocated to a SFCP; except those that reference other approved programs, those that are purely event-driven, those that are event-driven but have a time component for performing the surveillance on a one time basis once the event occurs, or those that are related to specific conditions.

TSTF 425 is applicable to the 12-month frequency of proposed SR 3.8.1.9.b since it is a fixed frequency and none of the exclusion criteria apply. Therefore, Duke Energy proposes to locate this frequency in the SFCP.

### 4 TECHNICAL EVALUATION

This LAR adds a TS Surveillance Requirement to verify steady state frequency requirements are within limits when a KHU is operating as an emergency power source for Oconee Nuclear Station. Duke Energy has determined that acceptable steady state limits are -1% to +3% nominal frequency (59.4 Hz to 61.8 Hz). These requirements were established based on the effect of frequency variations on key mechanical safety systems. Small perturbations outside of the steady state criteria due to expected load additions or removals are permitted. However, the transient peak values shall be within  $\pm 5\%$  frequency limits and of short time duration being no more than 10 seconds. Duke Energy's Corrective Action Program

addressed the need to establish steady state frequency requirements for the KHUs. These steady state frequency requirements are currently imposed by Selected Licensee Commitment (SLC) 16.8.5, Keowee Hydro Unit Steady State Frequency.

SRs currently exist in TSs to address the frequency requirements for each KHU. However, there is not a specific SR for maintaining steady state frequency at -1% to +3%, which would ensure that adequate steady state flow is delivered by key mechanical safety systems. This testing requirement has been added to existing Keowee procedures and has been previously tested successfully. NUREG 1430, Babcock and Wilcox Standard Technical Specifications (STS) include an SR to verify steady state frequency is within limits. 10 CFR 50.36(c)(3) requires TSs include surveillance requirements to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. Duke Energy has determined that a new SR to require steady state frequency limits be met as a condition for operability of each KHU is appropriate. The addition of the SR requirement makes ONS consistent with NUREG 1430 STS testing requirements.

## **5 REGULATORY EVALUATION**

### **5.1 Significant Hazards Consideration**

Duke Energy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment to Oconee Nuclear Station Facility Operating Licenses DPR-38, DPR-47, and DPR-55 by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below.

The requested change will require ONS to verify each Keowee Hydro Unit (KHU) can achieve a specified steady state frequency. This Technical Specification (TS) change is discussed in Section 3 above and detailed markups are included in Attachment 1 to this License Amendment Request (LAR).

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

Response: No.

The proposed amendment adds a new Technical Specification surveillance requirement to verify that the emergency power sources, KHUs, for the Oconee Nuclear Station achieve a steady state frequency of  $\geq 59.4\text{Hz}$  and  $\leq 61.8\text{Hz}$ . The proposed TS change implements a requirement already established by Selected Licensee Commitment (SLC) 16.8.5. The equipment used to collect steady state frequency data has been evaluated and will not affect the operation of the KHUs. Since the KHUs are not initiators of any accidents previously evaluated, the proposed change does not involve a significant increase in the probability of an accident previously evaluated. Since the performance of the surveillance has no effect on KHU operation, it does not involve a significant increase in the consequences of an accident previously evaluated.

Therefore, the proposed TS changes do not significantly increase the probability or consequences of an accident previously evaluated.

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

Response: No

The proposed change adds a new TS Surveillance Requirement. Performance of the surveillance has no effect on the operation of the KHUs. The changes do not alter the plant configuration (no new or different type of equipment will be installed) or make changes in methods governing normal plant operation. No installed equipment is being operated in a different manner. As such, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed change adds a new TS Surveillance Requirement. The change provides an additional restriction to enhance plant safety. The change maintains requirements within the safety analyses and licensing basis. As such, no question of safety is involved. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Duke Energy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

## **5.2 Applicable Regulatory Requirements/Criteria**

### **10 CFR 50.36(c)(3) - *Surveillance requirements***

Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

## **5.3 Precedent**

NUREG 1430, Standard Technical Specifications, Babcock and Wilcox Plants, Revision 4.0, Volume 1, Specifications, April 2012.

Comparable steady state frequency requirements are provided in TS 3.8.1, Surveillance Requirements 3.8.1.2 and 3.8.1.7.



#### **5.4 Conclusions**

Duke Energy 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 in Section 5.1 of this Enclosure. The regulatory requirements and guidance applicable to this LAR are identified in Section 5.2 above.

### **6 ENVIRONMENTAL CONSIDERATION**

Duke Energy has evaluated this License Amendment Request (LAR) against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. Duke Energy has determined that this LAR meets the criteria for a categorical exclusion as set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that the amendment meets the following specific criteria:

- (1) The amendment involves no significant hazard consideration as demonstrated in Section 5.1 above.
- (2) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite. The principal barriers to the release of radioactive materials are not modified or affected by this change and no significant increases in the amounts of any effluent that could be released offsite will occur as a result of this change.
- (3) There is no significant increase in individual or cumulative occupational radiation exposure. Because the principal barriers to the release of radioactive materials are not modified or affected by this change, there will be no significant increase in individual or cumulative occupational radiation exposure resulting from this change.

Therefore, no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment pursuant to 10 CFR 51.22(b).

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**ATTACHMENT 1**

**TECHNICAL SPECIFICATION AND BASES MARKUPS**

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.7      Verify both KHU's underground tie breakers cannot be closed simultaneously.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.8      Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.9      Verify on an actual or simulated emergency actuation signal each KHU auto starts and:</p> <div style="margin-left: 40px;"> <p>a.    Achieves frequency <math>\geq 57</math> Hz and <math>\leq 63</math> Hz and voltage <math>\geq 13.5</math> kV and <math>\leq 14.49</math> kV in <math>\leq 23</math> seconds; <span style="border: 1px solid black; padding: 0 2px;">and</span></p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">b. Achieves steady state frequency <math>\geq 59.4</math> Hz and <math>\leq 61.8</math> Hz; and</div> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">b.</div> <div>Supplies the equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when synchronized to system grid and loaded at maximum practical rate.</div> </div> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">c.</div> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">b.</div> <div></div> </div> </div>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.10      Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.8.1.11      Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

[start new paragraph] This surveillance also verifies the KHU's steady-state frequency is  $\geq 59.4$  Hz and  $\leq 61.8$  Hz. These limits were established to ensure key mechanical systems and equipment have adequate frequency for accident mitigation. The limits are automatically maintained by Keowee control systems. A nominal time of 60 seconds following the Emergency Start signal is sufficient time to begin monitoring steady state operation. [start new paragraph]

AC Sources – Operating  
B 3.8.1

## **BASES**

### **SURVEILLANCE REQUIREMENTS (continued)**

#### **SR 3.8.1.9**

This surveillance verifies the KHUs' response time to an Emergency Start signal (normally performed using a pushbutton in the control room) to ensure ES equipment will have adequate power for accident mitigation. UFSAR Section 6.3.3.3 (Ref. 9) establishes the 23 second time requirement for each KHU to achieve rated frequency and voltage. Since the only available loads of adequate magnitude for simulating an accident is the grid, subsequent loading on the grid is required to verify the KHU's ability to assume rapid loading under accident conditions. Sequential block loads are not available to fully test this feature. This is the reason for the requirement to load the KHUs at the maximum practical rate. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

#### **SR 3.8.1.10**

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

#### **SR 3.8.1.11**

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

#### **SR 3.8.1.12**

Verification of cell to cell connection cleanliness, tightness, and proper coating with anti-corrosion grease provides an indication of any abnormal condition, and assures continued OPERABILITY of the battery. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

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**ATTACHMENT 2**

**RETYPE TECHNICAL SPECIFICATIONS AND BASES**

**SURVEILLANCE REQUIREMENTS (continued)**

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify both KHU's underground tie breakers cannot be closed simultaneously.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.9	<p>Verify on an actual or simulated emergency actuation signal each KHU auto starts and:</p> <ul style="list-style-type: none"> <li>a. Achieves frequency <math>\geq 57</math> Hz and <math>\leq 63</math> Hz and voltage <math>\geq 13.5</math> kV and <math>\leq 14.49</math> kV in <math>\leq 23</math> seconds;</li> <li>b. Achieves steady state frequency <math>\geq 59.4</math> Hz and <math>\leq 61.8</math> Hz; and</li> <li>c. Supplies the equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when synchronized to system grid and loaded at maximum practical rate.</li> </ul>	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.11	Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.9

This surveillance verifies the KHUs' response time to an Emergency Start signal (normally performed using a pushbutton in the control room) to ensure ES equipment will have adequate power for accident mitigation. UFSAR Section 6.3.3.3 (Ref. 9) establishes the 23 second time requirement for each KHU to achieve rated frequency and voltage.

This surveillance also verifies the KHU's steady-state frequency is  $\geq 59.4$  Hz and  $\leq 61.8$  Hz. These limits were established to ensure key mechanical systems and equipment have adequate frequency for accident mitigation. The limits are automatically maintained by Keowee control systems. A nominal time of 60 seconds following the Emergency Start signal is sufficient time to begin monitoring steady state operation.

Since the only available loads of adequate magnitude for simulating an accident is the grid, subsequent loading on the grid is required to verify the KHU's ability to assume rapid loading under accident conditions. Sequential block loads are not available to fully test this feature. This is the reason for the requirement to load the KHUs at the maximum practical rate. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.10

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.11

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.