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Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station (ONS), Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287
Additional Information Regarding License Amendment Request for Temporary Technical Specification Change to Add a Required Action Completion Time for One Keowee Hydro Unit Inoperable for Generator Field Pole Rewinds
License Amendment Request (LAR) No. 2012-01, Supplement 4

On June 27, 2012, Duke Energy Carolinas, LLC (Duke Energy) submitted a License Amendment Request (LAR) requesting the Nuclear Regulatory Commission (NRC) approve a Technical Specification (TS) change that adds a temporary Completion Time to TS 3.8.1 Required Action (RA) C.2.2.5 to allow time to perform major maintenance on each Keowee Hydro Unit (KHU). By letters dated December 14, 2012, May 28, 2013, and July 26, 2013, Duke Energy responded to NRC Requests for Additional Information (RAIs). During a meeting with the NRC on November 13, 2013, Duke Energy agreed to provide additional information and to revise the proposed TS change. Also, as a result of the meeting, Duke Energy is making additional regulatory commitments associated with the LAR. The revised proposed TS changes included in this supplement are bounded by the no significant hazards consideration submitted in the June 27, 2012, LAR.

Enclosure 1 responds to specific NRC questions from the November 13, 2013, meeting and provides a description of the revised proposed TS changes. Enclosure 2 provides a list of the regulatory commitments made during the meeting. For completeness, Enclosure 2 also includes regulatory commitments made in previous supplements to this LAR. Attachments 1 and 2 provide revised TS markup pages and revised TS retyped pages. Attachments 3 and 4 provide revised TS Bases markup pages and revised TS Bases retyped pages.

The first Keowee generator pole rewind outage is scheduled to start January 28, 2014; therefore, Duke Energy requests NRC approval of this LAR by January 7, 2014. If there are any additional questions, please contact Boyd Shingleton, ONS Regulatory Affairs, at (864) 873-4716.

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NRR

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

Sincerely,

Scott L. Batson
Vice President
Oconee Nuclear Station

Enclosures
1. Additional Information Addressing NRC Questions
2. List of Regulatory Commitments

Attachments
1. Revised TS Markup Pages
2. Revised TS Retyped Pages
3. Revised TS Bases Markup Pages
4. Revised TS Bases Retyped Pages

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ENCLOSURE 1

Additional Information Addressing NRC Questions

1.0 Introduction

By letter dated June 27, 2012, Duke Energy Carolinas, LLC (Duke Energy), submitted an application to the Nuclear Regulatory Commission (NRC) for a proposed amendment for the Oconee Nuclear Station (ONS), Units 1, 2, and 3, which would revise the Technical Specification (TS) for the emergency power system. The revision would permit each of the two emergency power system generating units (Keowee Hydro Units) to be out of service for up to 75 days on a one-time basis for major maintenance work. By letters dated December 14, 2012, May 28, 2013, and July 26, 2013, Duke Energy responded to NRC Requests for Additional Information (RAIs). During a meeting with the NRC on November 13, 2013, Duke Energy provided additional justification and risk reduction measures to support the proposed LAR. Duke Energy also agreed to revise the proposed TS change to reduce the proposed Completion Time to 62 days as described in Section 2.0.

1.1 Keowee Hydro Station Major Maintenance

Duke Energy recognized the need for extended outages to perform major maintenance activities not long after the Keowee Hydroelectric Station (KHS) was commissioned in 1971. The need for major maintenance outages was not identified during the initial review of ONS Technical Specifications. Duke Energy subsequently requested and NRC approved a 45 day Completion Time for one Keowee Hydro Unit (KHU) inoperable. The NRC issued Amendment Nos. 50, 50, and 47 for Oconee Nuclear Station, Unit Nos. 1, 2, and 3, respectively, on November 3, 1977, in response to Duke Energy's request dated October 13, 1976, as supplemented by letter dated September 29, 1977. The amendments revised the Technical Specifications to allow operation of the Oconee Nuclear Station with one KHU out of service from 72 hours up to a maximum of 45 days (only once in a 3 year period) when the remaining KHU and both the overhead and underground transmission circuits are operable and the standby buses are energized by a Lee Combustion Turbine (LCT).

At the time of issuance of these amendments, the primary long term maintenance items identified as needing up to 45 days were hydro turbine runner and discharge ring welding repairs, which were estimated to be necessary approximately every six to eight years. Also, generator thrust and guide bearings were expected to require replacement approximately every six to eight years with a similar maintenance period. Duke Energy also indicated that other items which manifest as failures could possibly be resolved during the proposed maintenance periods without the need for special licensing actions.

Since issuance of the amendments in 1977, approximately 36 years ago, the 45 day Completion Time has been used eleven times. In 1979, KHU-2 was taken out of service for approximately 33 days to allow welding repair of the turbine blades. In 1982, KHU-2 was taken out of service for approximately 39 days to weld repair of the turbine blades. In 1984, KHU-2 was taken out of service for 16 days for emergent maintenance. KHU-2 tripped due to a generator field ground relay in November 1985 with the subsequent repair taking approximately 8 days. Since the 45 day Completion Time had already been used once in the previous 3 years, Duke Energy requested and received approval to use the remaining portion of the 45 day Completion Time for the repair. In

1987, KHU-1 was taken out of service for 17 days for generator stator maintenance. Maintenance requiring more than 72 hours was not required again until major refurbishment upgrades were performed on KHU-1 and KHU-2 in 2004 and 2005, respectively. These upgrades included refurbishment of each units turbines and replacement of the governor, voltage regulator, and batteries. The KHU-1 refurbishment outage was 49 days while the KHU-2 outage was 34 days.

Due to the scope of work planned for 2004 and 2005 upgrades, Duke determined additional time beyond the 45 day Completion Time was required. As a result, Duke Energy requested and NRC approved a one-time 17 day extension to the 45 day Completion Time for one KHU inoperable and a cumulative 120 hour extension to the 60 hour Completion Time for both KHUs inoperable (dual KHU outage). The extension allowed sufficient time to seal the wicket gates which was necessary to allow turbine work to proceed.

Other than the current request and the LAR that supported the 2004 and 2005 refurbishment outages, Duke Energy has made one other request for an extension to the 45 day Completion Time. This request was made in September 2006 to allow repair of a pole jumper on KHU-2. This repair took approximately 27 days. Since the 45 day Completion Time had already been used once in the previous 3 years, Duke Energy requested and received approval to use the remaining portion of the 45 day Completion Time (11 days) plus an additional 30 days. KHU-1 was taken out of service in August 2010 for stator maintenance for approximately 23 days. In August 2013 and September 2013, KHU-2 and KHU-1 were taken out of service for approximately 24 days and 14 days respectively for maintenance activities associated with the Protected Service Water tie-in to the Keowee Hydroelectric Station.

During preventive maintenance inspections in 2008 and 2009 Duke Energy identified normal wear mechanisms in rotor pole assemblies that prompted the current project to refurbish/overhaul both Keowee generators. The first phase, scheduled for January 2014 for KHU-2 and July 2014 for KHU-1 refurbishes and replaces all 56 generator field poles on each KHU. The second phase, which refurbishes the stator for each KHU, is planned for 2016 and 2017. Duke Energy also has long-range plans to replace the Keowee main step-up transformer.

1.2 Improved Keowee Generator Pole Outage Timeline

Since submittal of LAR 2012-01 on June 27, 2012, work scope and methods for the generator pole rewind outage have been better defined. As a result, the scheduled duration of the single KHU outage, including contingency, has been reduced from 75 days to 62 days. The 13 day reduction resulted from a re-evaluation of required tasks, eliminating the need to unwater the KHU to add balance shots, and eliminating some contingency time for the physical work, balance shots and the overall outage. The planned dual KHU outage time was reduced from 160 hours to 80 hours by a change in method that allows adding balance shots without unwatering the KHUs. The remaining 80 hours of dual KHU outage time is needed to remove the rotor and install a shaft locking device, and subsequently remove the shaft locking device and re-install the rotor (planned 40 hours for each evolution) on the KHU undergoing maintenance.

1.3 Diversity and Defense-In-Depth of ONS Electrical System

ONS can receive offsite power from multiple offsite sources that approach from the north, southwest, southeast, and east. Either of two LCTs can provide power to the safety related electrical buses at ONS. During the single KHU outage, the remaining KHU will be available to provide power via the underground emergency power path with capability to align to the overhead emergency power path. The LCTs are located to the southeast of ONS and can provide power via an isolated power path (electrically isolated from the grid) to the ONS standby buses via Transformer CT5. This transformer is located on the opposite side of the station from the 230 kV switchyard. Either of two Jocassee Hydro Units can be electrically separated from the grid and aligned directly to provide power to the 230 kV switchyard Yellow Bus to power safe shutdown loads. The Jocassee Hydro Units are located north of ONS while the LCTs are located in the opposite direction, southeast of ONS.

1.4 Backup Power for Emergency Power System

a) Currently credited in LAR

LAR 2012-01 credits a LCT as a backup power source to the inoperable KHU to support the originally proposed one-time 75 day Completion Time to maintain the defense-in-depth design philosophy of the electrical system to meet its intended design function. ONS TSs require a LCT to be energizing both standby buses via an isolated power path prior to exceeding the 72 hour Completion Time of TS 3.8.1 Required Action C.2.1 for the duration of the single KHU outages. ONS TS Condition H requires a LCT to be energizing both standby buses via an isolated power path prior to entry into a dual KHU outage. During the planned extended outages, the remaining KHU is required by TSs to be operable and aligned to the underground emergency power path with capability to be manually aligned to the overhead emergency power path. Both required offsite power sources are required to be verified operable by TSs prior to exceeding 72 hours in the extended outage. The proposed TS requires that the SSF and Emergency Feedwater (EFW) Systems be administratively verified operable prior to entering the extended Completion Time and does not permit discretionary maintenance or testing on the SSF, EFW and essential AC power systems. By letter dated December 14, 2012, Duke Energy committed to prohibit discretionary maintenance on the offsite power system (230 kV Switchyard) during the extended Completion Time and to maintain operability of required offsite circuits at all times (note that this is also a TS requirement). By letter dated May 28, 2013, Duke Energy committed to use a Critical Activity Plan (CAP) for the generator pole rewind outages and include similar risk mitigation strategies to those that are currently used in CAPs for scheduled dual KHU outages. The CAP will also include requirements to notify the Transmission Control Center and System Operating Center to take action to ensure grid reliability and minimize risks.

b) Additional backup power sources

Duke Energy will provide an additional backup power source and implement risk reduction measures to ensure safe shutdown should a loss of all station power occur during the generator pole rewind outages. Duke Energy will use a nearby hydro unit (Duke Energy's Jocassee Hydroelectric Station) as an additional backup power source to provide additional defense-in-depth

for the electrical power system at ONS. A Jocassee Hydro Unit can be black-started, aligned and dedicated to ONS via a power path isolated from the grid in accordance with approved procedures within approximately one hour.

The Jocassee Hydro Station contains four units rated 195 MW each. All four units generate at 14.4 kV, which is then stepped up to 230 kV. The Jocassee Hydro Station has a similar switchyard layout to ONS. It has a 230 kV and 525 kV switchyard, both in a breaker-and-a-half configuration connected via an auto-transformer. In the unlikely event that all other power sources (Offsite Grid, KHU Overhead, KHU Underground, CT5) are unavailable, and ONS is experiencing a Station Blackout, the Emergency Operating Procedure will be entered. When all power sources are confirmed to be unavailable, the following steps will be taken at ONS to dedicate a Jocassee Unit via the Jocassee Black Line:

1) Transmission Control Center (TCC) is informed of the following "Jocassee Hydro is needed to power ONS and 230 kV Yellow Bus has been separated from the Grid"
2) Jocassee Black Line isolated
3) When notified by the TCC that Jocassee Black Line is energized, PCB 15 (Jocassee Black Line Yellow Bus Tie) is closed. (This energizes the Yellow Bus and each ONS unit's startup transformer.)

To further address NRC concerns with the vulnerability of ONS during a dual KHU outage, Duke Energy will provide a temporary diesel generator at the Keowee Hydro Station to allow recovering the remaining operable but dewatered KHU within 4 hours. This recovery time is consistent with the required 4-hour station blackout coping duration for ONS. The temporary diesel generator allows recovering of the KHU by providing power to operate Keowee Hydro Station electrical auxiliaries, the intake gate hoist to provide water to the remaining operable KHU, and the powerhouse crane to set the locking beam in place should the rotor be in transit to the pedestal. Additionally, the Protected Service Water (PSW) system is installed and capable of aligning the Fant 100 kV line or a KHU to the SSF should the SSF diesel generator (DG) fail to start and run. This provides additional contingency for failures of transformer CT5 and Keowee power paths and allows realignment of these sources to PSW and the SSF. The SSF provides an alternate means of maintaining safe shutdown for all three ONS units until power can be restored to ONS.

c) Action that will be taken if backup power sources become unavailable

TS 3.8.1 Required Action C.2.2.1 requires a LCT to be energizing both standby buses via an isolated power path within 72 hours and within one hour from subsequent discovery of a deenergized standby bus. If the transmission line fails or the LCTs cannot be started and aligned to energize the standby buses within one hour then entry into TS 3.8.1 Condition M is required and all three ONS units are required to be placed in MODE 3 within 12 hours and MODE 5 within 84 hours. Should the Jocassee Hydro source become unavailable during the Keowee generator pole rewind outages, the Critical Activity Plan will require immediate action to restore the Jocassee Hydro source to available status.

1.5 Alternate Methods of Maintaining Safe Shutdown

The following systems/equipment can be used to maintain all three ONS units in a safe shutdown condition should a loss of all station power occur until power can be restored:

- Turbine Driven Emergency Feedwater Pump capable of feeding steam generators,
- SSF operable and capable of providing alternate shutdown capability, and
- Onsite diesel-driven feedwater pump capable of feeding steam generators.

A station blackout would result from the loss of all offsite power, the loss of the LCT energizing the standby buses, and the loss of the remaining KHU. Should this occur, emergency power will be restored within one hour by starting the second LCT and aligning to the standby buses, or starting one of the Jocassee Hydro Units and aligning to the Yellow Bus in the 230 kV switchyard. Should the remaining KHU be inoperable due to being dewatered during one of the two dual KHU outages, a temporary DG located at the KHS will be used to restore the KHU within 4 hours.

1.6 Risk Reduction Measures

ONS assesses and manages the increase in risk that may result from proposed maintenance activities in accordance with 10 CFR 50.65, Requirements for Monitoring Effectiveness of Maintenance at Nuclear Power Plants. Duke Energy's Risk Management Process requires a Critical Activity Plan (CAP) be written for the generator pole rewind outages. The CAP will include multiple risk mitigation strategies.

Based on past correspondence and the November 13, 2013, Duke Energy/NRC meeting, Duke Energy commits to include the following risk reduction measures in the CAP:

- ONS will not start the extended single KHU outage or a dual KHU outage if severe weather conditions are forecast.
- ONS 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.
- ONS will control the steam-driven emergency feedwater pump on each ONS unit as "protected" equipment during the extended TS completion time.
- ONS will continuously staff the SSF during the dual KHU outages.
- LCT and Central Switchyard will be protected
- 2nd LCT 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 230kV Yellow Bus within approximately one hour
- Temporary DG located at Keowee Hydro Station with capability to restore available KHU unit to operable status within 4 hours from dual KHU outage
- Reduced RCS Inventory not permitted during dual KHU outage
- Temporary Diesel-Driven pump available to feed each unit's steam generators
- PSW equipment installed and capable of aligning the Fant 100 kV line or a KHU to the SSF

2.0 Description of Revised Proposed Technical Specification Change

In ONS LAR dated June 27, 2012, as supplemented by letter dated December 14, 2012, Duke Energy proposed a 3rd Completion Time for TS 3.8.1 Required Action (RA) C.2.2.5 of 75 days with specific restrictions. Duke Energy proposes to reduce that Completion Time to 62 days. The proposed change is restated below with this change and minor changes required due to the issuance of Amendment Nos. 382, 384, & 383:

AND

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

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62 days from initial inoperability when Condition due to an inoperable KHU if entered to perform generator field pole rewind work.

Required Action C.2.2.3 will be modified to add the following Note:

----------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 field pole rewind work.

This note is needed to allow entry into the 60-hour dual KHU outage to reassemble the refurbished KHU and return it to functional condition prior to declaring the refurbished KHU operable. Without this note, entry into Condition L would be required and only 16 hours (12 hours allowed by the note to RA L.1 and 4 hours allowed by the Completion Time for Required Acton L.1) is allowed to restore the KHU and its required underground path. Only 4 hours is allowed to restore compliance with LCO 3.3.21.

The note from the second Completion Time of TS 3.8.1 Required Action C.2.2.5 is numbered as Note 1. A second note is added indicating it is not applicable to field pole rewind work or until one year after the KHU declared operable after the work:

----------NOTE----------
1. Not to exceed 45 days cumulative per rolling 3-year time period for each KHU.
2. Not applicable during generator field pole rewind work or until 1 year after KHU declared OPERABLE following rewind work.

This note is added to avoid using up the 45-day Completion Time concurrent with the new 62 day Completion Time and will provide some time to allow Duke Energy to perform emergent maintenance work should the need arise after a one year waiting period.

The following administrative change is proposed:

Delete the following note from the TS 3.8.1, C.2.1, Required Action Completion Time since it is no longer applicable:

----------NOTE----------
An additional 96 hours can be added to the following completion times. This expires on August 27, 2005 @1058 hours

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3.0 Regulatory Commitments

During the November 13, 2013, Duke Energy/NRC meeting to discuss the Keowee LAR, NRC staff expressed concern that the 45 day cumulative Completion Time of RA C.2.2.5 could be used during the same time period that the one-time 62 day Completion Time will be used. Duke Energy indicated in the meeting that a portion of the 45 day Completion Time has been used for each KHU for Protected Service Water (PSW) tie-in work (30 days available for KHU-1 and 22 days for KHU-2). Duke Energy currently has no plans to use the remaining time prior to the Keowee generator pole rewind work scheduled for 2014. To address NRC concerns, Duke Energy will not use the 2nd Completion Time for Required Action C.2.2.5 for planned Keowee work prior to the Keowee generator pole rewind outage. This is a regulatory commitment.

This regulatory commitment and other new regulatory commitments made in this submittal and in previous submittals associated with this LAR are listed in Enclosure 2, List of Regulatory Commitments.

4.0 Comparison of KHU and Switchyard Reliability and Unavailability

4.1 Reliability of Emergency Diesel Generators compared to KHU:

The KHUs have an unreliability of approximately 2.6E-03, compared to the best emergency diesel generator reliability in the Duke Energy nuclear fleet of 2.6E-02. This includes both failure to start and failure to run. Thus, the KHUs are about 10 times more reliable than an emergency diesel generator (EDG).

4.2 Unavailability of KHU compared to Emergency Diesel Generators

The KHU historical unavailability compared to EDGs is as follows:

- The individual EDG unavailability across Duke Energy Nuclear Units ranges from 1.5E-02 (5.5 days per year per EDG) to 2.46E-02 (9 days per year per EDG).
- Single KHU unavailability (either KHU) is 6.27E-02 (23 days per year), with each KHU representing 3.1E-02 (11.5 days) on an average basis.
- Both KHU units' unavailability is 1.14E-02 (4 days per year).

The KHU unavailability values above are based on a period of 10.5 years, which includes several previous extended outages for repair or refurbishment activities. The EDG unavailability provided is based upon a similar period of time.

One important difference between the KHU units and EDGs is that EDGs are not flexible in the load path and can only support a single essential bus with some limited cross connections in some cases. Each KHU is capable of supplying all emergency power loads and is flexible in that it can supply power via either the overhead lines or the underground lines to the Oconee Units. When an EDG is out a service, the typical arrangement has little in way of back-up power supplies that can support the affected essential bus. Thus, for ONS each KHU is fully redundant to the other without a loss of mitigation capability. Given the KHUs have significantly better reliability compared to a typical EDG, the risk impact of

KHU unavailability is lower compared to the typical extended EDG outage without back-up power available.

In comparing KHU unavailability to EDG unavailability, the direct numerical comparison is not an accurate view. The major maintenance activities for the EDGs are typically conducted during unit outages when the unavailability of EDGs is not tracked and not reported. These activities can involve EDG outages of up to a week or more, and result in a significant amount of unreported unavailability. On the other hand, major maintenance for the KHUs is typically performed during ONS power operations and is tracked for unavailability. Thus, for a KHU versus EDG comparison, the total EDG hours in maintenance are underreported although the outage risk impact may be similar depending on the outage schedule. If the typical one week duration per EDG per outage is used, the individual EDG unavailability would be higher than an individual KHU.

4.3 Switchyard Reliability and Availability for Oconee compared to other Duke Energy Nuclear site Switchyards.

The Duke Energy Probabilistic Risk Assessment (PRA) measures the Switchyard Reliability and Availability by the Loss of Off-site power initiating event frequency.

A review of the plant specific loss of off-site power initiating events for all of the Duke Energy nuclear switchyards compared to ONS shows that ONS LOOP probability is approximately the same as most of the other sites in the Duke Energy nuclear fleet as shown in the table below:

	LOOP with weather included	LOOP without weather included
Oconee (Units 1, 2, 3)	1.7E-02	1.5E-02
Duke Energy Nuclear Plant 1	1.7E-02	1.3E-02
Duke Energy Nuclear Plant 2	2E-02	1.2E-02
Duke Energy Nuclear Plant 3	2.5E-2	2.1E-2
Duke Energy Nuclear Plant 4	1E-02	8E-03
Duke Energy Nuclear Plant 5	8.1E-02	6.6E-02

An additional consideration is that ONS has considerably more defense-in-depth for large AC power sources than most Duke Energy sites. At ONS there are two different backup power sources (LCT and Jocassee Hydro Unit) capable of powering all ONS safe shutdown loads. The backup sources can be isolated from the grid and dedicated to ONS.

5.0 Significant PRA Model Changes and Assumptions

The difference between the core damage frequency (CDF) impact provided in 2003 and the current results is caused by differences in schedule and modeling assumptions. A summary list of the important differences is provided below followed by more detailed discussion.

A. Dual KHU outage duration is shorter than 2003 analysis
B. Tornado risk effectively eliminated by schedule restrictions
C. Reactor Coolant Pump Seal Upgrades
D. Oconee PRA Updates and HRA Methodology

The 2002 amendment request involved an extension of the TS completion time for the dual KHU outage activities. Thus, the longer duration of the dual KHU portion of the outage is a contributor to the higher 2003 results.

The 2003 CDF results are dominated by tornados and severe weather LOOP events. Although a reduced tornado frequency for scheduling the outage outside of peak tornado season was applied, tornado events were not eliminated in the 2003 dual KHU outage case because the duration was more than a few days. For the current analysis, tornado events were eliminated because of the short duration and administrative controls and risk management plans that require verification of a clear weather forecast to avoid potential impacts of severe weather on the availability of offsite power from the switchyard or the Lee Combustion Turbines. The short duration provides strong confidence in the weather forecast during the outage period.

An important plant change related to Keowee emergency power is the Reactor Coolant Pump (RCP) seal design. ONS Unit 1 has recently upgraded to the Flowserve N9000 seal design. ONS Units 2 and 3 have Bingham RCP seals. All of these seals have similar performance to the Combustion Engineering (CE) plant RCP seals assessed in WCAP-16175-P. In 2003, ONS Unit 1 had just completed an upgrade to a Sulzer seal similar in design to the N9000. Due to a lack of sufficient operating experience, Duke Energy chose to conservatively assume that a loss of seal cooling would result in seal failure consistent with the previous Westinghouse seal design. A sensitivity study was performed in the 2003 analysis using the Westinghouse Owners Group (WOG) 2000 RCP seal model which showed that this provided an additional significant CDF reduction. For the current plant design, the robust seal designs (N9000 & Bingham designs) provide about an order of magnitude further reduction in CDF from seal LOCAs compared to the WOG 2000 model results.

The current PRA results are based on Revision 4 of the Oconee PRA which incorporates a significant number of plant changes and modeling enhancements that have occurred since the completion of the Revision 2 model used in the 2003 analysis. Besides RCP seals, the human reliability analysis (HRA) approach has changed significantly with evolving industry PRA methods and standards. In particular, the Revision 2 model HRA did not directly address human error dependencies and their impact on recovery credit. In general, this change increases overall CDF estimates, but the required dedicated alignment of the Lee CTs to the Standby Buses prior to the outage minimizes this impact on Keowee outage risk impacts.

The issue of human error dependency analysis also affects the estimated risk benefit for an alternate onsite power supply. In the 2003 analysis, a sensitivity analysis was conducted for a DG system being installed at Oconee to provide replacement power for the KHU units. However, that analysis assumed that such recovery actions were independent of other operator actions related to the accident scenarios. This significantly overestimates the risk reduction that could be achieved. The current analysis also considers the option of adding a DG system during the extended KHU outage but uses more realistic assumptions about the maximum benefit that could be achieved. There are three reasons why the DG recovery action does not provide significant risk reduction.

- The ability and probability of success for operators to successfully start and properly load the DG system is low. This is a challenging task to execute even under normal (low stress) conditions because operators must start and parallel, possibly six diesel generators together, and load onto a bus that has been correctly load stripped and then reload the critical loads in the available time. Under high stress and time pressure, this action can be expected to have a high failure probability.
- The diesel generator recovery action is in direct competition with other high priority recovery actions, such as activating and running the SSF, restoring offsite power, restoring a KHU, aligning the standby Lee CT, or aligning a Jocassee Hydro Unit. In an HRA analysis the DG operator action occurs in the same time frame as the other actions, the same operators are involved, and the same cues to initiate the action are used. With these attributes, this new postulated operator action would be assessed as highly or completely dependent upon the existing credited actions. This level of dependency would result in very little if any credit reduction in CDF for the recovery action.
- A temporary onsite DG system is not considered capable of withstanding tornado events and is unlikely to be available following a tornado strike that damages the 230kV switchyard and/or 100kV Fant line. Thus, adding a DG system would provide minimal benefit in reducing the tornado-related CDF associated with the 62 day single KHU outage period.

Although seismic events are a potential cause of a loss of offsite power (LOOP) event, the relative frequency of a seismically-induced LOOP events is significantly lower than from all other causes (e.g., grid-related, switchyard-related, etc.). It is also noted that the basic component fragilities of the switchyard and transmission lines (providing offsite power) are shared in common with the component for the Keowee overhead transmission path. This dependency limits the seismic impact of the Keowee overhead unit maintenance. Thus, it is concluded that the exclusion of seismic events from the analysis does not significantly impact the results and conclusions of this evaluation.

6.0 Standby Shutdown Facility (SSF) Ability to Mitigate Station Blackout

The SSF houses stand-alone 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 system provides 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 $\geq$ 525°F (RCS cold leg temperature $\leq$ 555°F and RCS pressure ~ 2155 psig) following postulated fire, sabotage, or flooding events, and is designed in accordance with criteria associated with these events.

Loss of all other station power does not impact the SSF's capability to mitigate each event. The SSF is also credited as the alternate AC (AAC) power source and the source of decay heat removal required to demonstrate safe shutdown during the required four hour station blackout coping duration. The SSF is capable of maintaining all three ONS units in a safe shutdown condition for a period of 72 hours following a fire, turbine building flood, sabotage, or tornado missile events and station blackout.

7.0 Control of Keowee Rotor Lifts

The Keowee generator rotor lift will be controlled in accordance with the Duke Energy Nuclear Lifting Program. The rotor will be lifted straight up off the generator and moved to a stand that is bolted to the floor adjacent to the generator. The lift plan directs minimum moves as necessary while transporting the rotor. If the rotor were dropped while moving it from the operating location to the rotor stand no safety related equipment would be rendered inoperable. The load travel path minimizes interferences and the number of direction movements.

ENCLOSURE 2

REGULATORY COMMITMENTS

REGULATORY COMMITMENTS

The following commitment table identifies those actions committed to by Duke Energy Carolinas, LLC (Duke Energy) in this submittal. Other actions discussed in the submittal represent intended or planned actions by Duke Energy. They are described to the Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments.

From Duke Energy letter dated December 14, 2012:

	Commitment	Completion Date
1	No discretionary maintenance or testing on the offsite power system (230 kV Switchyard) will be performed	During 62 day CT for TS 3.8.1 RA C.2.2.5
2	Operability of required offsite circuits should be maintained at all times.	During 62 day CT for TS 3.8.1 RA C.2.2.5

From Duke Energy letter dated May 28, 2013:

	Commitment	Completion Date
1	Duke Energy will take the necessary steps to ensure the PSW tie-in work and the generator pole rewind work will not impact or conflict with each other. Note: This does not preclude performing the work concurrently. (As of November 15, 2013, PSW tie-in to Keowee is complete.)	During each KHU generator field pole rewind outage; expires on 1/1/2015
2	Duke Energy will use a Critical Activity Plan for the Keowee generator pole replacement outages for risk mitigation purposes. This plan will include similar risk mitigation strategies to those that are currently used in the Critical Activity Plans for scheduled Dual Unit Outages as described in the response to EEEB RAI 7 in the Enclosure to this letter. The Critical Activity Plan will include requirements to notify the Transmission Control Center (TCC) of plant risk changes that increase the plant's sensitivity to offsite power status and to notify the TCC and System Operating Center to take action to ensure grid reliability and minimize risks.	During each KHU generator field pole rewind outage; expires on 1/1/2015

From November 13, 2013, Duke Energy/NRC Meeting and this submittal:

	Commitment	Completion Date
1	ONS will not start the extended single KHU outage or a dual KHU outage if severe weather conditions are forecast.	During KHU generator pole rewind outages
2	ONS 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 pole rewind outages
3	ONS will control the steam-driven emergency feedwater pump on each ONS unit as "protected" equipment during the extended TS completion time.	During KHU generator pole rewind outages
4	ONS will continuously staff the SSF during the dual KHU outages.	During KHU generator pole rewind outages
5	Critical Activity Plan will include the following risk reduction measures: a) LCT and Central Switchyard protected b) 2nd LCT protected and available within one hour c) Verify Jocassee Hydro Unit available and can be aligned to the Oconee 230kV Yellow Bus within approximately one hour prior to start of outage d) Temporary DG located at Keowee Hydro Station with capability to restore available KHU unit to operable status within 4 hours from dual KHU outage e) Reduced RCS Inventory not permitted during dual KHU outage f) Temporary diesel-driven pump available to feed each unit's steam generators g) The Protected Service Water (PSW) system is installed and capable of aligning the Fant 100 kV line or a KHU to the SSF should the SSF diesel generator (DG) fail to start and run.	During KHU generator pole rewind outages
6	Duke Energy will not use the 2nd Completion Time for Required Action C.2.2.5 for planned Keowee work prior to the Keowee generator pole rewind outage for each KHU.	Ongoing until KHU generator pole rewind outages complete.

ATTACHMENT 1

TECHNICAL SPECIFICATION

MARKUP PAGES

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. KHU or its required overhead emergency power path inoperable due to reasons other than Condition A.	C.1	Perform SR 3.8.1.3 for OPERABLE KHU.	1 hour if not performed in previous 12 hours AND Once per 7 days thereafter
	AND		
	C.2.1	Restore the KHU and its required overhead emergency power path to OPERABLE status.	----------NOTE---------- An additional 96 hours can be added to the following completion times. This expires on August 27, 2005 @1058 hours ---------- 72 hours AND 72 hours from discovery of inoperable KHU
	OR		
	C.2.2.1	Energize both standby buses from LCT via isolated power path.	72 hours AND 1 hour from subsequent discovery of deenergized standby bus
		AND	
	C.2.2.2	Suspend KHU generation to grid except for testing.	72 hours
		AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.3 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. AND	72 hours

----------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 field pole rewind work.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.4 Verify alternate power source capability by performing SR 3.8.1.16. AND	72 hours AND Every 31 days thereafter
	C.2.2.5 Restore KHU and its required overhead emergency power path to OPERABLE status.	28 days when Condition due to an inoperable Keowee main step-up transformer AND 1 ----------NOTE---------- Not to exceed 45 days cumulative per rolling 3-year time period for each KHU ---------- 45 days from discovery of initial inoperability when Condition due to an inoperable KHU

2. Not applicable during generator field pole rewind work or until 1 year after KHU declared OPERABLE following rewind work.

AND

----------NOTE----------
1. No discretionary maintenance or testing allowed on SSF, EFW and essential AC Power Systems.
2. Only applicable one time for each KHU due to generator field pole rewind work and expires on January 1, 2015.
3. Only applicable if the SSF and EFW are administratively verified OPERABLE prior to entering the extended Completion Time.
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62 days from initial inoperability when Condition due to an inoperable KHU to perform generator field pole rewind work

(continued)

ATTACHMENT 2

TECHNICAL SPECIFICATION

RETYPED PAGES

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. KHU or its required overhead emergency power path inoperable due to reasons other than Condition A.	C.1	Perform SR 3.8.1.3 for OPERABLE KHU.	1 hour if not performed in previous 12 hours AND Once per 7 days thereafter
	AND		
	C.2.1	Restore the KHU and its required overhead emergency power path to OPERABLE status.	72 hours AND 72 hours from discovery of inoperable KHU
	OR		
	C.2.2.1	Energize both standby buses from LCT via isolated power path.	72 hours AND 1 hour from subsequent discovery of deenergized standby bus
	AND		
	C.2.2.2	Suspend KHU generation to grid except for testing.	72 hours
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	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 field pole rewind work. ---------- 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. AND	72 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2.4 Verify alternate power source capability by performing SR 3.8.1.16. AND	72 hours AND Every 31 days thereafter
	C.2.2.5 Restore KHU and its required overhead emergency power path to OPERABLE status.	28 days when Condition due to an inoperable Keowee main step-up transformer AND ----------NOTE---------- 1. Not to exceed 45 days cumulative per rolling 3 year period for each KHU. 2. Not applicable during generator field pole rewind work or until 1 year after KHU declared OPERABLE following rewind work. ---------- 45 days from discovery of initial inoperability when Condition due to an inoperable KHU

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)		AND ----------NOTE---------- 1. No discretionary maintenance or testing allowed on SSF, EFW and essential AC Power Systems. 2. Only applicable one time for each KHU due to generator field pole rewind work and expires on January 1, 2015. 3. Only applicable if the SSF and EFW are administratively verified OPERABLE prior to entering the extended Completion Time. ---------- 62 days from initial inoperability when Condition due to an inoperable KHU to perform generator field pole rewind work
D. KHU or its required underground power path inoperable.	D.1 Perform SR 3.8.1.4 for OPERABLE KHU. AND D.2 Energize either standby bus from LCT via isolated power path.	1 hour if not performed in previous 12 hours 24 hours AND 1 hour from subsequent discovery of deenergized required standby bus

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	AND		
	D.3	Restore KHU and its required underground emergency power path to OPERABLE status.	72 hours AND 72 hours from discovery of inoperable KHU
E. Required Action and associated Completion Time not met for Required Action D.2.	E.1	Be in MODE 3.	12 hours for one unit AND 24 hours for other unit(s)
	AND		
	E.2	Be in MODE 5.	84 hours
F. Zone overlap protection circuitry inoperable when overhead electrical disconnects for KHU associated with the underground power path are closed.	F.1	Restore zone overlap protection circuitry to OPERABLE status.	72 hours
	OR		
	F.2	Open overhead electrical disconnects for KHU associated with the underground power path.	72 hours
G. Both emergency power paths inoperable due to one inoperable E breaker and one inoperable S breaker on the same main feeder bus.	G.1	Restore one breaker to OPERABLE status.	24 hours

(continued)

ATTACHMENT 3

TECHNICAL SPECIFICATION BASES

MARKUP PAGES

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

If the inoperable KHU or its required overhead emergency power path are not restored to OPERABLE status within 72 hours as required by Required Action C.2.1, a controlled shutdown must be initiated as required by the Required Actions for Condition M unless the extended Completion Times of Required Action C.2.2.5 are applicable. The second Completion Time for Required Action C.2.1 establishes a limit on the maximum time allowed for a KHU to be inoperable during any single contiguous occurrence of having a KHU inoperable. If Condition C is entered as a result of switching an inoperable KHU from the underground to the overhead emergency power path, it may have been inoperable for up to 72 hours. This could lead to a total of 144 hours since the initial failure of the KHU. The second Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time the KHU become inoperable, instead of at the time Condition C was entered.

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The extended Completion Times of Required Action C.2.2.5 apply when the KHU or its required overhead emergency power path is inoperable due to an inoperable Keowee main step-up transformer ~~or~~ an inoperable KHU (if not used for that KHU in the previous 3 years). In order to use the extended Completion Times, within 72 hours of entering Condition C both standby buses must be energized from an LCT (Required Action C.2.2.1), KHU generation to the grid except for testing must be suspended (Required Action C.2.2.2), the remaining KHU and its required underground emergency power path and both required offsite sources must be verified OPERABLE, the LCOs indicated in Required Action C.2.2.3 must be verified to be met, and alternate power source capability must be verified by performing SR 3.8.1.16.

, or a KHU made inoperable to perform generator field pole rewind work

Required Action C.2.2.5 permits maintenance and repair of a Keowee main step-up transformer which requires longer than 72 hours. Transformer replacement is rare but is time extensive. A 28 day Completion Time is permitted by Required Action C.2.2.5 to restore the KHU and its overhead power path to OPERABLE status when inoperable due to an inoperable Keowee main step-up transformer. This allows a reasonable period of time for transformer replacement.

Required Action C.2.2.5 also permits maintenance and repair of a KHU which requires longer than 72 hours. The primary long term maintenance items are expected to be hydro turbine runner and discharge ring welding

BASES

ACTIONS C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

repairs which are estimated to be necessary every six to eight years. Also, generator thrust and guide bearing replacements are necessary. Other items which manifest as failures are expected to be rare and may be performed during the permitted maintenance periods. The 45 day restoration time of Required Action C.2.2.5 is allowed to be applied cumulatively over a rolling three year period for each KHU. This Completion Time is 45 days from discovery of initial inoperability of the KHU. This effectively limits the time the KHU can be inoperable to 45 days from discovery of initial inoperabilty rather than 45 days from entry into Condition C and precludes any additional time that may be gained as a result of switching an inoperable KHU from the underground to the overhead emergency power path. The Completion Time is modified by a ~~note~~ indicating it is not to exceed 45 days cumulative in a rolling 3-year time period for each KHU. For example, if KHU-1 is inoperable for 15 days, the 45-day Completion Time for KHU-1 is reduced to 30 days for the rolling 3-year time period containing the 15 day inoperability. This requires a review of entries for the previous 3 years to determine the remaining time allowed in the 45-day Completion Time. If the 72 hour Completion Time of C.2.1 is not exceeded, the 45-day Completion is not applicable and is not reduced.

Note 1

The temporary 62-day Completion Time of Required Action C.2.2.5 is allowed for each KHU to perform generator field pole rewind work. The 62-day Completion Time is modified by three notes that provide conditions for using the extended outage. Note 1 indicates that no discretionary maintenance or testing is allowed on the Standby Shutdown Facility (SSF), Emergency Feedwater (EFW), and essential alternating current (AC) Power Systems. Note 2 indicates that the 62-day Completion Time is only applicable one time for each KHU due to generator field pole rewind work and expires on January 1, 2015. Note 3 indicates that it is only applicable if the SSF and EFW are administratively verified OPERABLE prior to entering the extended Completion Time. This increases the probability, even in the unlikely event of an additional failure, that the risk significant systems will function as required to support their safety function.

Required Actions C.2.2.1, C.2.2.2, C.2.2.3, and C.2.2.4 must be met in order to allow the longer restoration times of Required Action C.2.2.5. Required Action C.2.2.1 requires that both standby buses be energized using an LCT through the 100 kV transmission circuit. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the 100 kV transmission circuit is vulnerable to severe weather a time limit is imposed. The second Completion Time of Required Action C.2.2.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action C.2.2.2 requires suspension of KHU generation to the grid except for testing. The restriction reduces the number of possible failures which could cause loss of the underground emergency power path. Required Action C.2.2.3 requires verifying by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE. This provides additional assurance that offsite power will be available. In addition, this assures that the KHU and its required underground emergency power path are available.

Required Action C.2.2.3 also requires verifying by administrative means that the requirements of the following LCOs are met:

The 45-day Completion Time is also modified by Note 2 indicating that it is not applicable during generator field pole rewind work or until one year after KHU declared OPERABLE following rewind work. This note is added to avoid using up the 45-day Completion Time concurrent with the 62-day Completion Time and preserves some time to perform emergent maintenance work should the need arise after a one year waiting period.

BASES

ACTIONS C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

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."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

Verifying by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is subsequently determined inoperable, or an LCO stated in Required Action C.2.2.3 is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

Required Action C.2.2.4 requires verifying alternate power source capability by performing SR 3.8.1.16. This confirms that entry into Condition C is due only to an inoperable main step-up transformer or an inoperable KHU, as applicable. If SR 3.8.1.16 is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

Required Action C.2.2.3 is modified by a note indicating that it is 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 work. This note is needed to allow entry into the 60 hour dual unit outage to reassemble the refurbished KHU and return it to functional condition, as well as perform balance runs and shots, post modification testing, and a commissioning run prior to declaring the refurbished KHU operable. Without this note, entry into Condition L would be required allowing only 16 hours to restore the KHU and its required underground path and only 4 hours to restore compliance with LCO 3.3.21.

ATTACHMENT 4

TECHNICAL SPECIFICATION BASES

RETYPED PAGES

BASES

ACTIONS C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

If the inoperable KHU or its required overhead emergency power path are not restored to OPERABLE status within 72 hours as required by Required Action C.2.1, a controlled shutdown must be initiated as required by the Required Actions for Condition M unless the extended Completion Times of Required Action C.2.2.5 are applicable. The second Completion Time for Required Action C.2.1 establishes a limit on the maximum time allowed for a KHU to be inoperable during any single contiguous occurrence of having a KHU inoperable. If Condition C is entered as a result of switching an inoperable KHU from the underground to the overhead emergency power path, it may have been inoperable for up to 72 hours. This could lead to a total of 144 hours since the initial failure of the KHU. The second Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time the KHU become inoperable, instead of at the time Condition C was entered.

The extended Completion Times of Required Action C.2.2.5 apply when the KHU or its required overhead emergency power path is inoperable due to an inoperable Keowee main step-up transformer, an inoperable KHU (if not used for that KHU in the previous 3 years), or a KHU made inoperable to perform generator field pole rewind work. In order to use the extended Completion Times, within 72 hours of entering Condition C both standby buses must be energized from an LCT (Required Action C.2.2.1), KHU generation to the grid except for testing must be suspended (Required Action C.2.2.2), the remaining KHU and its required underground emergency power path and both required offsite sources must be verified OPERABLE, the LCOs indicated in Required Action C.2.2.3 must be verified to be met, and alternate power source capability must be verified by performing SR 3.8.1.16.

Required Action C.2.2.5 permits maintenance and repair of a Keowee main step-up transformer which requires longer than 72 hours. Transformer replacement is rare but is time extensive. A 28 day Completion Time is permitted by Required Action C.2.2.5 to restore the KHU and its overhead power path to OPERABLE status when inoperable due to an inoperable Keowee main step-up transformer. This allows a reasonable period of time for transformer replacement.

Required Action C.2.2.5 also permits maintenance and repair of a KHU which requires longer than 72 hours. The primary long term maintenance items are expected to be hydro turbine runner and discharge ring welding

BASES

ACTIONS C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

repairs which are estimated to be necessary every six to eight years. Also, generator thrust and guide bearing replacements are necessary. Other items which manifest as failures are expected to be rare and may be performed during the permitted maintenance periods. The 45-day Completion Time of Required Action C.2.2.5 is allowed to be applied cumulatively over a rolling three year period for each KHU. This Completion Time is 45 days from discovery of initial inoperability of the KHU. This effectively limits the time the KHU can be inoperable to 45 days from discovery of initial inoperability rather than 45 days from entry into Condition C and precludes any additional time that may be gained as a result of switching an inoperable KHU from the underground to the overhead emergency power path. The Completion Time is modified by Note 1 indicating it is not to exceed 45 days cumulative in a rolling 3-year time period for each KHU. For example, if KHU-1 is inoperable for 15 days, the 45-day Completion Time for KHU-1 is reduced to 30 days for the rolling 3-year time period containing the 15 day inoperability. This requires a review of entries for the previous 3 years to determine the remaining time allowed in the 45-day Completion Time. If the 72 hour Completion Time of C.2.1 is not exceeded, the 45-day Completion is not applicable and is not reduced. The 45-day Completion Time is also modified by Note 2 indicating that it is not applicable during generator field pole rewind work or until one year after KHU declared OPERABLE following rewind work. This note is added to avoid using up the 45-day Completion Time concurrent with the 62 day Completion Time and preserves some time to perform emergent maintenance work should the need arise after a one year waiting period.

The temporary 62-day Completion Time of Required Action C.2.2.5 is allowed for each KHU to perform generator field pole rewind work. The 62-day Completion Time is modified by three notes that provide conditions for using the extended outage. Note 1 indicates that no discretionary maintenance or testing is allowed on the Standby Shutdown Facility (SSF), Emergency Feedwater (EFW), and essential alternating current (AC) Power Systems. Note 2 indicates that the 62-day Completion Time is only applicable one time for each KHU due to generator field pole rewind work and expires on January 1, 2015. Note 3 indicates that it is only applicable if the SSF and EFW are administratively verified OPERABLE prior to entering the extended Completion Time. This increases the probability, even in the unlikely event of an additional failure, that the risk significant systems will function as required to support their safety function.

Required Actions C.2.2.1, C.2.2.2, C.2.2.3, and C.2.2.4 must be met in order to allow the longer restoration times of Required Action C.2.2.5.

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

Required Action C.2.2.1 requires that both standby buses be energized using an LCT through the 100 kV transmission circuit. With this arrangement (100 kV transmission circuit electrically separated from the system grid and all offsite loads), a high degree of reliability for the emergency power system is provided. In this configuration, the LCT is serving as a second emergency power source, however, since the 100 kV transmission circuit is vulnerable to severe weather a time limit is imposed. The second Completion Time of Required Action C.2.2.1 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost. Required Action C.2.2.2 requires suspension of KHU generation to the grid except for testing. The restriction reduces the number of possible failures which could cause loss of the underground emergency power path. Required Action C.2.2.3 requires verifying by administrative means that the remaining KHU and its required underground emergency power path and both required offsite sources are OPERABLE. This provides additional assurance that offsite power will be available. In addition, this assures that the KHU and its required underground emergency power path are available.

Required Action C.2.2.3 also requires verifying by administrative means that the requirements of the following LCOs are met:

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."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.

BASES

ACTIONS

C.1, C.2.1, C.2.2.1, C.2.2.2, C.2.2.3, C.2.2.4, and C.2.2.5 (continued)

Verifying by administrative means allows a check of logs or other information to determine the OPERABILITY status of required equipment in place of requiring unique performance of Surveillance Requirements. If the AC Source is subsequently determined inoperable, or an LCO stated in Required Action C.2.2.3 is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L. Required Action C.2.2.3 is modified by a note indicating that it is 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 work. This note is needed to allow entry into the 60 hour dual unit outage to reassemble the refurbished KHU and return it to functional condition, as well as perform balance runs and shots, post modification testing, and a commissioning run prior to declaring the ref urbished KHU operable. Without this note, entry into Condition L would be required allowing only 16 hours to restore the KHU and its required underground path and only 4 hours to restore compliance with LCO 3.3.21.

Required Action C.2.2.4 requires verifying alternate power source capability by performing SR 3.8.1.16. This confirms that entry into Condition C is due only to an inoperable main step-up transformer or an inoperable KHU, as applicable. If SR 3.8.1.16 is subsequently determined not met, continued operation up to a maximum of four hours is allowed by ACTION L.

D.1, D.2 and D.3

With the KHU or its required underground emergency power path inoperable, sufficient AC power sources remain available to ensure safe shutdown of the unit in the event of a transient or accident. Operation may continue for 72 hours if the remaining KHU and its required overhead emergency power path are tested using SR 3.8.1.4 within one hour if not performed in the previous 12 hours. SR 3.8.1.4 is only required to be performed when the KHU associated with the overhead emergency power path is OPERABLE. This Required Action provides assurance that no undetected failures have occurred in the overhead emergency power path. Since Required Action D.1 only specifies "perform," a failure of SR 3.8.1.4 acceptance criteria does not result in a Required Action not met. However, if the KHU and its required overhead emergency path fails SR 3.8.1.4, both KHUs and their required emergency power paths are inoperable, and Condition I for both KHUs and their emergency power paths inoperable for reasons other than Condition G or H is entered concurrent with Condition D. This

BASES

ACTIONS

D.1, D.2 and D.3 (continued)

demonstration is to assure that the remaining emergency power path is not inoperable due to a common cause or due to an undetected failure. For outages of the KHU and its required underground emergency power path in excess of 24 hours, an LCT (using the 100 kV transmission circuit electrically separated from the grid and offsite loads) must energize a standby bus prior to the outage exceeding 24 hours. This ensures the availability of a power source on the standby buses when the KHU and its required underground emergency power path are out of service in excess of 24 hours. The second Completion Time of Required Action D.2 permits the standby buses to be re-energized by an LCT within 1 hour in the event this source is subsequently lost.

The second Completion Time for Required Action D.3 establishes a limit on the maximum time allowed for a KHU to be inoperable during any single contiguous occurrence of having a KHU inoperable. If Condition D is entered as a result of switching an inoperable KHU from the overhead to the underground emergency power path, it may have been inoperable for up to 72 hours. This could lead to a total of 144 hours since the initial failure of the KHU. The second Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time the KHU become inoperable, instead of at the time Condition D was entered.

E.1 and E.2

If the Required Action and associated Completion Time for Required Action D.2 are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours for one Oconee unit and 24 hours for other Oconee unit(s) and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

F.1 and F.2

With the zone overlap protection circuitry inoperable when the overhead electrical disconnects for the KHU associated with the underground power path are closed, the zone overlap protection circuitry must be restored to OPERABLE status or the overhead electrical disconnects must be opened within 72 hours. In this Condition, both KHUs and their required emergency power paths are OPERABLE, however a single failure could result in the loss of both KHUs.

BASES

ACTIONS (continued)

G.1

With both emergency power paths inoperable due to an E breaker and S breaker inoperable on the same main feeder bus, one breaker must be restored to OPERABLE status. In this Condition, both emergency power paths can still provide power to the remaining main feeder bus.

H.1 and H.2

With both KHUs or their required emergency power paths inoperable for planned maintenance or test with both standby buses energized from an LCT via an isolated power path, the KHU must be restored to OPERABLE status within 60 hours. Operation with both KHUs and their required power paths inoperable is permitted for 60 hours provided that both standby buses are energized using an LCT through the 100 kV transmission circuit and the requirements of the Note to the Condition are met. The Note to the Condition indicates that it may only be entered when both offsite sources are verified by administrative means to be OPERABLE and the requirements of the following LCOs are verified by administrative means to be met:

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;" and

LCO 3.3.19, "EPSL 230 kV Switchyard DGVP."

This increases the probability, even in the unlikely event of an additional failure, that the DC power system and the 120 VAC Vital Instrumentation power panelboards will function as required to support EPSL, power will not be lost to ES equipment, and EPSL will function as required.