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SUBJECT: Application for amends to licenses DPR-38,DPR-47 & DPR-55, consisting of proposed changes to UFSAR provided in Attachment 1.Implementation of changes does not result in undue risk to health & safety of public.

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September 17, 1998

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
Request for Amendment
Keowee Emergency Power Engineered Safeguards
Functional Test

Pursuant to 10 CFR 50.90, Duke Power Company hereby requests an amendment to Facility Operating License Nos. DPR-38, DPR-47, and DPR-55 for Oconee Nuclear Station Units 1, 2, and 3, respectively. The amendment consists of the proposed changes to the Updated Final Safety Analysis Report (UFSAR) provided in Attachment 1. The Technical Justification for the amendment is included in Attachment 2. Attachments 3 and 4 contain the No Significant Hazards Consideration Evaluation and the Environmental Assessment, respectively.

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A modification is planned that will add voltage and frequency protection for Oconee loads when supplied from a Keowee Hydro Unit. The protection will separate Oconee loads from a Keowee Unit if that unit's voltage or frequency becomes greater than 110% or less than 90% of rated value at any time after loading. The planned design will delay the loading of Oconee loads on the underground power path until the Keowee Unit reaches greater than 90% voltage and frequency.

During the design phase of this modification, considering the frequency overshoot the Keowee units experience on emergency start, questions arose concerning whether the preferred loading design for the emergency power system is

60% loading or 90% loading. For this reason, the Keowee Emergency Power and Engineered Safeguards Functional Test (KEP&ESF) is planned. The test, scheduled during the upcoming Unit 3 outage (3EOC17), will be performed on the Keowee underground path and will consist of two parts. One test will load the Keowee unit at its present design of approximately 60% rated voltage and frequency and a second test using the same loads will load the Keowee unit at approximately 90% rated voltage and frequency. Test data will be collected throughout the Oconee Emergency Power System during each test. Duke will review the test data to determine whether it is prudent to implement the delayed loading modification. Regardless of the loading scheme design chosen, out-of-tolerance (OOT) voltage and frequency protection will be installed.

This test will be performed with Unit 3 at cold shutdown with its engineered safeguards (ES) loads on the Standby Buses. Operation of the other two units should not be affected by the test. However, in the extremely unlikely (2E-9) event that a real loss of coolant accident with loss of offsite power (LOCA/LOOP) were to occur on either of the operating units simultaneously with test initiation (simulated LOCA/LOOP) on Unit 3, the Oconee Emergency Power System would be placed in a condition outside the design bases. Additionally, the requirements of Selected Licensee Commitment 16.5.5 Shutdown Cooling Requirements (RCS Loops not full and Fuel Transfer Canal is not full) will not be met during each test when power is intentionally interrupted to the low pressure injection (LPI) pumps during the simulated loss of offsite power (LOOP) and again during the dead bus transfer back to the unit startup transformer. For these reasons Duke Power believes this test involves an unreviewed safety question (USQ) which requires prior NRC approval of the test in accordance with 10 CFR 50.90.

Depending on the results, it may be necessary to repeat portions of the test. Duke Power will have pre-test and post-test briefings for each of the two portions of the test. The post-test briefing will assess the test results with respect to the acceptance criteria. If it is necessary

to repeat a portion of the test, the status of the Oconee units will be evaluated to determine if a retest can be safely conducted. Duke Power does not intend to perform a portion of the test more than three times without reviewing the test plan with the NRC.

Upon NRC approval of this submittal, the Oconee UFSAR will be changed per Attachment 1.

The Keowee Emergency Power and Engineered Safeguards Functional Test is planned during the upcoming Unit 3 outage (3EOC17). The outage schedule shows the test should occur during the first or second week in November. However, if circumstances arise that require the unit to shut down early or if a unit trip were to occur, the test schedule could move forward. For this reason, Duke requests that this submittal be reviewed and approved on an expedited basis and no later than November 1, 1998 to allow the test to proceed as planned and not delay the restart of Unit 3.

This proposed change to the Facility Operating License and our determination of no significant hazards have been reviewed and approved by the Oconee Plant Operational Review Committee (PORC) and Nuclear Safety Review Board (NSRB). The implementation of these changes does not result in an undue risk to the health and safety of the public.

If there are any questions regarding this submittal, please contact Fred Owens at (864) 885-3042.

Very truly yours,

W. R. McCollum, Jr.
Site Vice President
Oconee Nuclear Station
FEO

cc: L. A. Reyes, Regional Administrator
Region II

M. A. Scott, Senior Resident Inspector
Oconee Nuclear Site

D. E. LaBarge, Project Manager
NRR

V. R. Autry,
DHEC

W. R. McCollum, Jr., being duly sworn, states that he is Vice President of Duke Power Company, that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this revision to the Oconee Nuclear Station License Nos. DPR-38, DPR-47, and DPR-55; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

W. R. McCollum, Jr., Vice President

Subscribed and sworn to before me this 17th day of September, 1998.

Cenie M. Breazeale
Notary Public

My Commission Expires:

2-12-2003

Attachment 1

UFSAR
Addition to Section 14.2
"Tests Prior To Reactor Fuel Loading"
Page 14-7

A Keowee Emergency Power - Engineering Safeguards Functional Test which involves Oconee Unit 3 during shutdown conditions has been evaluated. This test verifies certain design features of the emergency power and engineering safeguards systems in an integrated fashion. The scope of the test supports Nuclear Station Modification (NSM) ON-53014. This integrated test will emergency start the Keowee Unit aligned to the underground power path from shutdown condition and accept loads from the shutdown Oconee Unit through the standby bus.

ATTACHMENT 2

Technical Justification

An integrated Keowee Emergency Power and Engineered Safeguard Functional (KEP&ESF) Test is desired to collect data in support of NSM ON-53014. The proposed NSM involves two basic changes to the Keowee emergency power system; (1) delayed loading (i.e. 90% of rated Voltage and frequency) of Oconee accident loads, and (2) OOT voltage and frequency protection for the Keowee units. ON-53014 will provide delayed loading of Oconee accident loads and add OOT voltage and frequency protection to each of the Keowee units in response to a commitment made to the NRC. This new coincidence logic, upon detection of OOT voltage or frequency (after a time delay), will trip the associated unit's output breaker disconnecting it from the Oconee loads. The new logic will also delay the loading of the Keowee units until "in tolerance" at approximately 90% rated voltage and frequency. The KEP&ESF test will determine the preferred loading design for the emergency power system, i.e. 60 or 90% loading.

This KEP&ESF test has been deemed to result in an USQ. This test is performed with Unit 3 at cold shutdown with its engineered safeguards (ES) loads on the Standby Buses. The other two Oconee units should not be affected by the test. However, in the extremely unlikely (2E-9) event that a real LOCA/LOOP were to occur on either of the operating units during the simulated LOCA/LOOP test on Unit 3, the Oconee Emergency Power System would be placed in a condition outside the design bases. The Emergency Power System may not be capable of handling the electrical loading of two instantaneous LOCA/LOOP events without some safety related equipment being adversely affected, i.e. tripping off, experiencing low voltage, etc. The emergency power system (EPS) would be able to handle the electrical loading if the two events were offset in time (≈ 10 seconds) to allow the first unit's load to reach steady state condition prior to the second unit's emergency loads starting. Therefore, an infinitesimally small, but non-zero, increase in the probability of a malfunction of equipment important to safety and the potential consequences of a LOCA/LOOP event

is created by the test. Additionally, the requirements of Selected Licensee Commitment 16.5.5 Shutdown Cooling Requirements (RCS Loops not full and Fuel Transfer Canal is not full) will not be met during each test when power is intentionally interrupted to the Unit 3 LPI pumps during the simulated LOOP and again during the dead bus transfer back to the Unit 3 startup transformer. Because this test and similar electrical tests are beneficial to Duke in verifying the reliability of the Oconee Emergency Power Systems, upon NRC approval of this submittal, Duke will add the following verbiage to UFSAR Section 14.2 "Tests Prior To Reactor Fuel Loading":

"A Keowee Emergency Power - Engineered Safeguards Functional Test which involves Oconee Unit 3 during shutdown conditions has been evaluated. This test verifies certain design features of the emergency power and engineered safeguards systems in an integrated fashion. The scope of the test supports proposed Nuclear Station Modification (NSM) ON-53014. This integrated test will emergency start the Keowee Unit aligned to the underground power path from shutdown condition and accept loads from the shutdown Oconee Unit through the standby bus."

The following provides a description, safety analysis, shutdown risk assessment, no significant hazards evaluation, and environmental evaluation of the test. This information indicates that the emergency power ES functional test will not result in any undue risk to the public health and safety.

Test Overview

Two tests simulating LOCA/LOOP emergency loading on the Keowee underground path are scheduled to be performed during the upcoming 3EOC17. One test, after installation of a temporary modification, will load the Keowee underground unit at approximately 90% rated voltage and frequency as it accelerates from a "black start". After removal of the temporary modification, a second test using the same loads will load the Keowee underground unit at its present design of approximately 60% rated voltage and frequency as it accelerates from a "black start". Two tests are being performed using the same loads and source so that valid comparisons of the two loading schemes can be made. These

two tests are very similar to Test 3 of the integrated Emergency Power and Engineered Safeguards Functional Test (TT/O/A/0610/025) successfully performed in January 1997. The January 1997 test was reviewed and approved by the staff in a Safety Evaluation Report dated January 2,1997.

These tests will be performed shortly after fuel is reloaded in the reactor vessel. The reactor vessel head will be installed and torqued with the reactor coolant system (RCS) partially filled. Steam generator hand holes and one pressurizer safety valve will be removed to prevent pressurizing the reactor coolant system when water is injected into the RCS. Since open vent paths will be present, low temperature over pressurization (LTOP) will not be a concern. The affected mechanical safety systems and components will operate as described in the UFSAR, i.e. low pressure service water (LPSW) pumps will start, high and low pressure injection (HPI & LPI) pumps will start, all three reactor building cooling units (RBCUs) will start in low speed, both reactor building spray (RBS) pumps will start and the reactor building spray system will be recirculated rather than released into the reactor building, the penetration room ventilation system (PRVS) will start, and containment isolation will occur. In addition, the motor driven emergency feedwater (MDEFW) pumps will start as a result of the loss of power.

Emergency core cooling system injection flow via HPI will be provided from the borated water storage tank (BWST) to the RCS. Boron concentration will be maintained at greater than or equal to refueling concentration throughout the tests. RCS temperature will be maintained between 75 and 100 degrees Fahrenheit. With these conditions, reactivity management will not be compromised during these tests.

For this test, Oconee Unit 3 status prior to the test initiation will be in normal cold shutdown alignment with power being supplied from the 230kV switchyard via the start-up transformer (CT3). The LOOP simulation for Unit 3 will be accomplished by manually opening the switchyard power circuit breakers (PCBs 28 and 30) supplying CT3. The LOCA simulation for Unit 3 will be accomplished by manually depressing the engineered safeguards (ES) test buttons. All ES channels 1-8 will be actuated starting all ES pumps, motors, fans, valves, etc. to simulate as close as practical

full design accident loading. However, there are practical and physical limitations to simulation of an actual accident or operating event loads. As a result, some pump alignments, such as RBS, will be operated in recirculation or bypass flow loops. Also, certain motor operated valves will not be tested. For example RBS valves to containment and LPI pump suction valves from the BWST will remain closed. To help offset the loss in steady state load as a result of certain pumps operating in the bypass mode, additional loads will be added. For example, two spent fuel pool (SFP) cooling pumps will be configured to automatically start and load with the LOCA loads. The following lists the major loads to be started:

- 3 - HPI pump motors
- 2 - LPI pump motors
- 2 - RBS pump motors
- 2 - LPSW pump motors
- 2 - MDEFW pump motors
- 3 - RBCU fan motors
- 2 - SFP pump motors
- Most ES actuated MOVs

Oconee Units 1 and 2 operation will not be affected during this test. This test will be considered an infrequently performed test or evolution, thus requiring management oversight as recommended by the Institute Of Nuclear Power Operations (INPO) SOER 91-01. Training will be given to the Operators and contingency plans will be developed as part of this test.

Data Collection

Electrical power data will be collected during each test. Test equipment will be monitoring various points throughout the emergency power system including:

- The Keowee unit
- Standby and Main feeder buses
- 4kV switchgear and selected loads
- Vital 600 and 208V MCC and selected loads including MOVs

Test Acceptance Criteria

The purpose of this test(s) is to collect data to support the proposed NSM ON-53014. These data collection tests have a specific test acceptance criterion to collect the applicable data so that the two designs can be assessed. However, this test is also considered a functional test of the emergency power system as modified by NSM-ON-53014, thus functional acceptance criteria will be included in the test acceptance. The acceptance criteria are:

- Both Keowee Units emergency start on engineered safeguards actuation.
- Oconee Unit 3 automatically load sheds and transfers to receive power from the standby bus.
- The connected Unit 3 4kV motors (HPI, LPI, RBS, LPSW, MDEFW) and 600V RBCU LOCA loads start and operate until secured.
- The connected non-load shed loads are energized following the transfer to the standby bus.
- Tested valves move to their ES position.
- Data acquisition is acceptable to evaluate NSM ON-53014.

Temporary Modification ONTM-2042 will temporarily install delayed loading equipment and circuitry at the Keowee Hydro Unit (KHU) supplying the underground power path. A temporary enclosure will be located at Keowee's control panels and temporary connections will be made in the panels. This TM will prohibit the underground Keowee unit from loading until both voltage and frequency are greater than 90% rated V&F. The TM uses identical components (sensing relays) and will mimic the operation of Keowee after installation of NSM ON-53014. If the permanent design of Oconee Nuclear Station (ONS) loading is modified to the delayed (90%) loading with ON-53014, credit for this testing will be taken and only circuit and logic checks will be verified.

Safety Analysis

The purpose of Keowee Hydro Station is to supply a reliable source of emergency power to Oconee during a design basis event (DBE). The initiation of Keowee emergency startup is accomplished by control signals from either Oconee control room. Normal startup of either unit is by operator action, while emergency startup is automatic. Both units are started automatically and simultaneously and run at standby on either of three conditions: 1) external grid trouble protection system actuation, 2) engineered safeguards actuation, or 3) main feeder bus monitor undervoltage actuation. If the units are already operating when any of the above conditions occur, they are separated from the network (and momentarily from the underground path) and continue to run in standby mode until needed. Each unit's voltage regulator is equipped with a volts-per-cycle limiting feature which permits it to accept full emergency power load as it accelerates from zero to full speed within 23 seconds from receipt of the emergency startup initiation signal. The emergency power supply from Keowee will remain available throughout the performance of this test.

The electrical power system can receive power from the various available sources. The maximum electrical emergency power needed is equivalent to the LOCA loads of one Oconee unit plus the hot shutdown loads of the other two Oconee units. This load is within the capabilities of the available generators, i.e. Keowee units and the Lee combustion turbines, and the associated pathways (including cables) with the limiting factor being the respective transformers (CT-4 and CT-5) which are rated at 22.4 MVA.

The Unit 3 control room will have an Operations Senior Reactor Operator and two Reactor Operators dedicated to the performance of the test. Because the 230KV PCBs, Keowee, CT-4, and CT-5 are all controlled from the Unit 1 and 2 Control Room, that Control Room will have an Operations Senior Reactor Operator and a Reactor Operator dedicated to the performance of the test. The licensed operators involved with the test will receive classroom and simulator training on the test procedure. During the classroom training, the Keowee Emergency Power Engineered Safeguards Functional Test procedure, TT/3/A/0610/030, will be reviewed to ensure that

the operators are familiar with the anticipated actions to be performed and the objectives to be achieved by the successful completion of the test. The simulator will be used to give the operators involved with the test actual hands on experience performing the procedure under simulated operating conditions. The operators will also be exposed to simulated failures requiring use of the contingency plan procedures. These include operator actions for a LOCA/LOOP on an operating unit. In addition, the non-licensed operators involved with the test will receive an on-shift review of specified tasks by their supervision in preparation for the test.

This test places Oconee Unit 3 in an alignment that essentially removes the preferred offsite power source from the startup transformer. The overhead path from Keowee would, however, continue to be automatically available through the startup transformer. The risk involved with this alignment may be less than that associated with other alignments allowed by Technical Specifications. However, this KEP&ESF test has been deemed to result in a USQ. This test is performed with Unit 3 at cold shutdown with its ES loads on the STBY Buses. The other two units should not be affected by the test. However, in the extremely unlikely event that a real LOCA/LOOP were to occur on either of the operating units during this test (simulated LOCA/LOOP) on Unit 3, the Oconee Emergency Power System would be placed in a condition outside the design bases. The Emergency Power System may not be capable of handling the electrical loading of two instantaneous LOCA/LOOP events without some safety related equipment being adversely affected, i.e. tripping off, experiencing low voltage, etc. Therefore, an infinitesimally small, but non-zero, increase in the probability of a malfunction of equipment important to safety and the potential consequences of a LOCA/LOOP event is created by the test.

However, there are two key factors that influence the risk. First, the planned testing is of a limited duration. Second, the likelihood of a coincident LOCA and loss of offsite power is very low. Even in the event the test has to be repeated for data gathering, the probability of a coincident LOCA/LOOP on another unit has been evaluated and found to be acceptably small. Therefore, it can be concluded that the likelihood of a LOCA/LOOP sequence at ONS on either of the

two operating units while this Keowee test is being performed during the upcoming outage is extremely low, approximately 2E-9.

This test will be performed shortly after fuel is reloaded into the reactor vessel. Approximately one third of the fuel is new, and the decay heat loads will be relatively low. Assuming loss of all DHR, the calculated time to boil is conservatively calculated to be approximately eighty nine (89) minutes. The vessel head will be installed and torqued; however, the steam generator hand holes and one pressurizer safety valve will be removed on Oconee Unit 3 when ECCS injection occurs. This arrangement precludes any potential for LTOP problems (Ref. OSC-4437, RCS Vent Path Alternatives to the PORV for HPI System Check Valve Functional Testing Under LTOP Conditions). The suction source for the injection systems will be the BWST which contains greater than or equal to refueling concentration borated water at > 75 F. Thus, there are no reactivity management or 10 CFR 50 Appendix G concerns. The test injection flow rates are insignificant compared to those required to cause fuel assembly/control rod lift.

Concerning Unit 3, Selected License Commitment 16.5.4 already addresses the acceptability of stopping DHR for short periods to swap pumps, perform testing, etc. Although this SLC does not cover the RCS conditions involved in this particular test, eighty nine (89) minutes are available before core boiling occurs based on actual core data and no assumed operator action. Core uncovery and possible fuel damage is not considered a concern during the performance of this test. The relatively long time to boiling, in conjunction with the contingency plans in the procedures, provide defense in depth to ensure that heat removal capability can be regained in a timely manner without incident.

The time to boil for the Unit 3 SFP, in the event of continued loss of cooling is approximately thirty four (34) hours.

Oconee Units 1 and 2 operation will be unaffected. The intentional and controlled interruption of power to the Oconee Unit 3 auxiliaries, including decay heat removal (DHR) systems will not affect the two operating units. There are no

reactor trip, shutdown margin, or reactivity management concerns on either of the operating units.

At approximately 15 seconds (first test) and 12 seconds (second test) after the simulated LOCA/LOOP initiation, Oconee Unit 3 will be re-powered by the selected emergency power source. The switchyard will remain energized and available, and can quickly be reconnected to Unit 3 at any time. A single Keowee unit or Lee Gas Turbine supplying power through its respective transformer (CT-4 and CT-5) is designed to provide adequate power to supply one Oconee unit's LOCA loads and the other two Oconee units' hot shutdown loads. Sufficient loads will be provided by running various systems to simulate LOCA conditions on Unit 3.

If there is a loss of normal power sources on any unit, the engineered safeguards functions will be powered by a Keowee unit that will start up and accelerate to full speed within 23 seconds. The loading of the LOCA loads will occur at less than 100% voltage and frequency. This statement reflects the design basis that the Keowee hydro units come up to rated speed, injection system valves start stroking, and pumps begin operating before rated voltage and 60 Hertz frequency are achieved. Note that the routinely performed Emergency Power Switching Logic (EPSL) functional test starts certain loads under these reduced voltage and frequency conditions.

The electrical power systems, under the alignments described above, will have no adverse impact on plant accident mitigation. During the Keowee test, a Lee Gas Turbine will be running in standby and energizing CT5 through a dedicated 100kV line. The availability of the additional power sources is provided as a conservative measure to ensure that redundant and diverse power sources are available. Provisions are also made in the procedure to recover additional loads (CCW, SFP cooling, HVAC, etc.).

The above safety analysis indicates that this Keowee emergency power ES functional test provides assurance that adequate power sources are available during the performance of the test. In addition, the test procedure adequately addresses the potential for loss of decay heat removal and compensatory actions should decay heat removal be lost. Therefore, performance of these type emergency power tests

will not present an undue risk to the public health and safety.

Shutdown Risk Assessment

In addition to the above safety analysis, an independent shutdown risk assessment was performed for the Keowee Emergency Power ES Functional Test. This assessment, performed in accordance with site directives for the Shutdown Protection Plan, addressed the following shutdown risk key safety functions:

1. Decay Heat Removal

Oconee Unit 3 will have fuel in the core and will have been shutdown for 30 days or longer. The test will be performed after refueling with approximately 31% new fuel in the core. Therefore, decay heat is very low. Actual RCS temperatures will be controlled between 75 and 100°F, rather than the 140°F typically assumed in the Loss of DHR abnormal procedure (AP). During the test, Oconee Unit 3 will have the Reactor head on with the RCS vented through Steam Generator hand holes and a Pressurizer Safety Valve nozzle.

Oconee Unit 3's LPI system will be in the decay heat removal mode with one train in operation using the non-ES pump ("C"). The remaining ES train will be in standby. The non-ES pump ("C") will lose power during the test but both ES pumps will start in response to the ES signal. Pump "C" will remain available for restart if one of the ES pumps fails to start.

Unit 3's LPI and RBS pumps will be taking suction from the decay heat drop line and suction header simultaneously. This may impact available NPSH. Calculations have been performed which demonstrated adequate NPSH at lower flow rates. These flow rates have been incorporated into the test procedure.

The RBS will be in a recirculation flow configuration. It will be discharging to the LPI piping while LPI is also in service. Flows will be monitored to assure that differences in discharge pressures do not result in one or more pumps

being dead headed without adequate recirculation flow. Due to the expected short period of operation in this alignment, any affect on pump flows due to pressure differentials between systems is not expected to impact the RCS.

The LPSW system will be in service, with two pumps providing flow to various components, including both decay heat coolers on Unit 3. The condenser circulating water (CCW) system, which provides water to the LPSW suction header, will be in service with the LPSW suction header being cross-connected with, and supplied by, Units 1 and 2 CCW systems.

When power is transferred by the test scenarios, the components providing DHR will initially lose power. The operating LPSW and LPI pumps should be re-energized in approximately 12 to 15 seconds, depending on the scenario. This should restore full DHR with no operator action. If the power transfer does not occur properly, contingency plans and abnormal procedures provide guidance to restore power from another source.

Spent Fuel Pool Cooling

Unit 3 SFP cooling pumps will lose power during each power transfer. Temporary jumpers will allow two pumps to restart immediately when power is regained. Unit 3 Recirculating Cooling Water pumps will be shut down and RCW to the Unit 3 SFP coolers will be supplied from the Unit 1 and 2 RCW system, which should not lose power during the tests. When this realignment is made prior to the test, there will be an immediate verification of adequate RCW flow to the SFP coolers. SFP temperature will be monitored frequently to assure that the pool is not heating up at an unacceptable rate prior to the ES actuation.

The time to boil for the Oconee Unit 3 SFP is greater than 34 hours. Existing procedures provide contingency guidance for loss of SFP cooling scenarios.

2. RCS Inventory Control

The initial RCS level will be 190-210 inches pressurizer level. The HPI system on Oconee Unit 3 will be available but not operating. There will be no seal injection, normal makeup, or letdown flows. All three HPI pumps will be

started and run for a short period in ES mode. Therefore, the test will result in an increase in RCS inventory. The system is vented so that LTOP is not a concern.

During the test, the HPI pumps receive an ES signal to start. The HPI pumps should be energized in approximately 12 to 15 seconds, depending on the scenario. As soon as operators verify that the pumps started as expected, the pumps will be shut down.

RCS temperature is not expected to significantly change. Since power will be interrupted to the LPI pumps, there will be a loss of DHR. But, as described above, power should be restored in approximately 12 to 15 seconds and no temperature increase should be seen. Due to the low decay heat loads, even an extended loss of DHR should not result in a significant temperature rise. Therefore, there should be little change in RCS volume due to temperature transients.

Since the temperatures of the RCS and the potential cooling sources are near ambient, no nil-ductility or thermal shock limits will be challenged.

In the event that a significant RCS inventory loss were to occur during the test, the LPI system would be used to make up to the RCS upon restoration of power. If LPI was the source of the leak and had to be isolated, the HPI system could be realigned to maintain RCS inventory. The BWST will initially be full and will be available for gravity flow make-up, if needed.

3. Power Availability

No power transfer should result in a loss of power for more than approximately 15 seconds. This entire test is intended to demonstrate design features to assure power availability for design basis events. The emergency power switching logic is tested on each Oconee unit on a refueling basis. The principle difference between this test and other tests performed periodically is that this test will load a Keowee unit with the expected ES loads of one Unit using the underground power path. The overhead power path will not be affected and will operate as designed.

During the performance of the test, it is conceivable that some components may fail due to previously undetected defects. The test procedure contains many provisions to address this potential:

1) The test has been identified as a SOER 91-01 infrequently performed test or evolution, requiring enhanced management oversight.

2) The test will contain contingency plans for various potential problems and will reference existing procedures and other compensatory action guidance where appropriate.

3) The test will employ the defense in depth concept. Test prerequisites and conditions will comply with Site Directive 1.3.2 which establishes the Shutdown Protection Plan. Therefore, the availability of redundant trains, alternate systems, and mitigation equipment will be maximized. A number of system and/or component experts, craft technicians, and support personnel will be available to respond and diagnose any failures and restore any key safety function which might be lost due to a failure.

Throughout the entire test, even during transfers, AC power will be available either automatically or with minor operator action from all of the following sources:

1. Switchyard to Unit 3's main feeder buses via the normal source (backcharged main auxiliary transformer).

2. Switchyard to all unit's main feeder buses via the startup transformer (CT-1, CT-2, CT-3).

3. Keowee to all unit's main feeder buses via the startup transformer (CT-1, CT-2, CT-3).

4. Keowee to all unit's main feeder buses via the standby transformer (CT-4) and the standby Buses.

5. Lee Gas Turbine to all unit's main feeder buses via a dedicated 100kV line and the standby buses. A Lee Gas

Turbine will be running in standby during each part of the emergency power ES functional test.

It is also noted that, unlike most plants, each main feeder bus can supply all trains of the Oconee Engineered Safeguards Systems. Therefore, failure of one feeder breaker to a main feeder bus does not result in the corresponding loss of safety loads.

4. Reactivity Control

Even if RCS inventory was reduced, the sources of makeup are those normally available, which are borated adequately to permit use without decreasing shutdown margin. The control rods are fully inserted and will not be manipulated during this test. No significant RCS temperature changes are expected which could reduce shutdown margin. Therefore, no reactivity changes are expected.

Spent Fuel Pool

No fuel handling activities on Unit 3 will be performed during this test. The SFP will be isolated from the fuel transfer canal and the BWST such that SFP level cannot be affected. Since the SFP will not be drained or filled during the test, boron dilution is not a concern. There is an existing procedure for Loss of SFP Cooling which would provide guidance for make-up if an extremely long loss of power occurred, such that SFP make-up was required.

5. Containment

This test should have no adverse impact on containment closure for any of the three Oconee units. The test will be conducted with the equipment hatch on Unit 3 closed.

The Shutdown Protection Plan and associated Operating Procedures provide guidance on containment closure and contingency provisions for restoring containment closure if necessary.

Test scenarios will result in Oconee Unit 3 containment isolation valves being aligned in their non-ES positions then moving to their ES (closed) positions.

6. Fire Protection

Fire Protection requirements of the Oconee Technical Specifications are applicable at all times. During the transfers, Unit 1 power will not be interrupted to the HPSW pumps and the jockey pump, which supply the fire hydrants and hose stations. In the unlikely event that Unit 1 unexpectedly loses power during the test, the elevated water storage tank will contain inventory to supply the HPSW system for a period of time.

7. Emergency Plan Considerations

The test scenarios were reviewed for interaction with the Emergency Plan in the extremely unlikely event that an incident occurs. The following items were considered as "worst case" possibilities (all would require multiple failures):

If the red and yellow switchyard buses are lost for greater than 15 minutes, the Emergency Plan will require that an "UNUSUAL EVENT" be declared.

If both main feeder buses on one Oconee unit remain deenergized greater than 15 minutes, the Emergency Plan will require that an "ALERT" be declared.

If Decay Heat Removal is lost such that RCS temperature has, or is projected to, exceeded 200°F prior to restoration, the Emergency Plan will require that an "ALERT" be declared.

8. Impact On The Operating Units

This test should have little or no impact on Units 1 and 2. Some interaction will occur when Unit 1&2 Control room personnel perform certain actions required by the test procedure (such as shutdown of Keowee).

The ONS Switchyard is not expected to be affected, except for periods when Keowee may be paralleled to the grid as the emergency start signals are reset. This should not have any impact on the operating units.

In the unlikely event that Unit 1 and 2 unexpectedly lose power during the test, the Units would trip. Their emergency power switching logic (EPSL) systems would still be operable, and power should transfer to the Startup source from the switchyard. If loss of the switchyard is the initiating event, the Keowee unit connected to the overhead path should provide power. If necessary, they would also load-shed non-essential loads and automatically connect to the Keowee underground path. The turbine driven emergency feedwater pumps would be available on each unit to feed the steam generators.

Other contingencies for the operating units include:

1) Use motor driven emergency feedwater (MDEFW) pumps to feed the steam generators (can cross connect units if one has power but the other does not).

2) Use SSF auxiliary service water pump to feed the steam generators, (powered by SSF diesel, if necessary).

9. Summary

As detailed in the above shutdown risk assessment, adequate levels of defense in depth will be in place for all of the key safety functions. In addition, the appropriate level of contingency plans are in place to mitigate the potential risk associated with the performance of this emergency power and ES functional test.

ATTACHMENT 3

No Significant Hazards Consideration Evaluation

Determination of No Significant Hazards

This proposed change has been evaluated against the standards in 10 CFR 50.92 and has been determined to involve no significant hazards considerations, in that operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated?

   No. For this test, the affected unit is Oconee 3 which will be in a post refueling shutdown condition. All safety functions for maintaining safe shutdown of the unit are available. The UFSAR Loss of Electric Power accident assumes two types of events: (1) Loss of load and (2) Loss of all system and station power. Since Unit 3 will be shutdown during performance of this test, a unit trip cannot occur. Nothing associated with this test will result in a significant increase in the likelihood of a loss of all systems and station power since both Keowee units and the switchyard will remain available. In addition, the gas turbines at Lee Steam station will be available and the SSF diesel will be operable. The loss of all station power accident analysis assumptions are still valid. Additionally, since the switchyard will remain energized and available, offsite power can quickly be reconnected to the plant. Core uncovery and possible fuel damage is not considered a concern during the performance of this test.

   Oconee Units 1 and 2 will continue to operate as normal during this test, and should be unaffected. The intentional and controlled interruption of power to the Oconee Unit 3 auxiliaries, including decay heat removal (DHR) systems will not effect the two operating units. There are no reactor trip, shutdown margin or

reactivity management concerns on either of the operating units.

The Keowee units provide the main source of emergency power for the Oconee units, but they are not accident initiators. This test has no adverse impact on the ability of the Keowee units to satisfy their design requirements of achieving rated speed and voltage within 23 seconds of receipt of an emergency start signal.

Although not a design basis accident, a hypothetical station blackout condition where all offsite power and the Keowee units are lost is described in the UFSAR. As detailed above, this test will not deenergize the switchyard or remove the Keowee units. Thus, emergency power systems will remain available, as well as the standby shutdown facility (SSF) diesel, and there is no significant increase in likelihood of a station blackout. The performance of this test does not affect the probability of an accident evaluated in the UFSAR (LOOP, LOCA, and LOCA/LOOP) occurring on an operating unit.

In the extremely unlikely (2E-9) event that a real LOCA/LOOP were to occur on either of the operating units simultaneously with test initiation (simulated LOCA/LOOP) on Unit 3, the Oconee Emergency Power System would be placed in a condition outside the design bases. The Emergency Power System may not be capable of handling the electrical loading of two instantaneous LOCA/LOOP events without some safety related equipment being adversely affected, i.e. tripping off, experiencing low voltage, etc. Therefore, an infinitesimally small, but non-zero, increase in the probability of a malfunction of equipment important to safety AND the potential consequences of a LOCA/LOOP event is created by the test. Additionally, the requirements of Selected Licensee Commitment 16.5.5 Shutdown Cooling Requirements (RCS Loops not full and Fuel Transfer Canal is not full) will not be met during each test when power is intentionally interrupted to the LPI pumps during the simulated LOOP and again during the dead bus transfer back to the unit startup transformer. However, the chances of an actual

LOCA/LOOP occurring on one of the operating units during the short interval of performance of this test has been shown to be insignificant.

There is no adverse impact on containment integrity, radiological release pathways, fuel design, filtration systems, main steam relief valve setpoints, or radwaste systems. Therefore, based on the probabilistic risk assessment (PRA) analysis and information presented in the Safety Analysis Section of this submittal, the probability or consequences of an accident previously evaluated will not be significantly increased by the proposed test and related UFSAR change.

2. Create the possibility of a new or different kind of accident from the accidents previously evaluated?

No. The emergency power systems will remain operable and available to mitigate accidents. Unit 3 will already be in a shutdown condition, so there is no risk of an Oconee Unit 3 trip, challenge to the reactor protective system (RPS), and LOCA/LOOP scenarios, and most UFSAR analyzed accident scenarios do not apply to it. Since Unit 3 will have been shutdown for greater than 30 days and be in a post refueling condition, the decay heat loads are relatively low. Additionally, on Oconee Unit 3, while the vessel head will be on and intact and with fuel in the core when ECCS injection occurs, the steam generator hand holds and one pressurizer safety valve will be removed. This arrangement precludes any potential for low temperature overpressurization (LTOP) problems. The suction source for the injection systems will be the BWST which contains highly borated water at > 75 F. Thus there are no reactivity management or 10 CFR 50 Appendix G (NDTT) concerns. The test injection flow rates are insignificant compared to those required to cause fuel assembly/control rod lift.

Oconee Units 1 and 2 will continue to operate as normal during this test, and should be unaffected. The intentional and controlled interruption of power to the Oconee Unit 3 auxiliaries, including decay heat removal (DHR) systems will not affect the two operating units. There are no reactor trip, shutdown margin or

reactivity management concerns on either of the operating units.

Preplanning, use of dedicated operators, and independent verification will be employed during critical test phases.

As addressed in question 1 above, in the extremely unlikely (2E-9) event that a real LOCA/LOOP were to occur on either of the operating units simultaneously with test initiation (simulated LOCA/LOOP) on Unit 3, the Oconee Emergency Power System would be placed in a condition outside the design bases. Therefore, an infinitesimally small, but still non-zero, increase in the probability of a malfunction of equipment important to safety AND the potential consequences of a LOCA/LOOP event is created by the test and related UFSAR change. However, based on the supporting information in the PRA calculation and the supporting Safety Analysis, no new significant failure modes or credible accident scenarios are postulated.

3. Involve a significant reduction in a margin of safety?

No. No function of any safety related emergency power system/component will be adversely affected or degraded as a result of this test. No safety parameters, setpoints, or design limits are adversely affected. For this test, Unit 3 will be in a shutdown condition, so there is no risk of an Oconee Unit 3 trip, challenge to the reactor protective system (RPS), LOCA/LOOP scenarios, and most UFSAR analyzed accident scenarios. Strictly per the Technical Specifications, emergency core cooling systems (ECCS) and auxiliary power systems are not required on a unit with RCS temperature less than 200°F. However, both the emergency power and DHR systems will remain available during the test. Decay heat removal will only be briefly interrupted during the simulated LOCA/LOOP portions of the test. Since Unit 3 will be shutdown for greater than 30 days at the time of the test, the decay heat loads will be relatively low, and compensatory measures will be in place to ensure heat removal capability can be regained in a timely manner. Additionally, while the vessel head

will be in place and torqued and fuel will be in the core on Oconee Unit 3 when ECCS injection occurs, the steam generator hand holes and one pressurizer safety valve will be removed.

Oconee Units 1 and 2 will continue to operate as normal during this test, and should be unaffected. The intentional and controlled interruption of power to the Oconee Unit 3 auxiliaries, including decay heat removal (DHR) systems will not affect the two operating units. There are no significant reactor trip, shutdown margin or reactivity management concerns on either of the operating units.

There is no adverse impact to the nuclear fuel, cladding, RCS, or required containment systems. Therefore, the margin of safety is not significantly reduced as a result of this test.

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

Attachment 4

Environmental Assessment

Environmental Assessment

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

1) A significant hazards consideration.

This conclusion is supported by the determination of no significant hazards.

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

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

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

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

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