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SUBJECT: Application for amend to licenses DPR-38,DPR-47 & DPR-55 to change UFSAR.Technical justification for amend & NSHC evaluation & EA,encl.

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CATEGORY 1 DOCUMENT

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DUKE POWER

December 11, 1996

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
Oconee 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.

In a meeting between the NRC and Duke Power on September 19, 1996, Duke committed to perform a one-time emergency power engineered safeguards (ES) functional test in late 1998 or early 1999. The emergency power ES functional test was conceptually described in the meeting and a Duke Power submittal to the NRC dated October 31, 1996.

All three Oconee units are currently shutdown to perform piping inspections on the secondary system. Once the three Oconee units were shutdown, the NRC requested, in a letter dated October 18, 1996, that Duke consider a review of the possibility of performing the emergency power ES functional test during the outage of the three Oconee units. In the October 31, 1996, submittal, Duke committed to perform the

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one-time emergency power ES functional test provided that Duke's test development team concluded that the performance of the test was feasible.

In a letter dated November 21, 1996, Duke committed to the performance of the one-time emergency power ES functional test of the Oconee emergency power system. Duke evaluated the scope of the emergency power ES functional test from both a deterministic and probabilistic perspective. The emergency power ES functional test will demonstrate that the current testing and design analyses provide a high level of confidence that the Oconee emergency power system can perform its intended safety function. In addition to demonstrating design basis requirements, certain portions of the test will also exercise the emergency power system under the most likely scenarios for a three unit loss of offsite power.

The resulting spectrum of test conditions represents various plant conditions in order to provide confidence that the emergency power system will perform its design basis function. It should be noted that the scope of the Oconee emergency power ES functional test is much broader than a typical ES actuation in that this test will simulate single failures to achieve bounding loading configurations. The planned emergency power ES functional test consists of six individual parts which demonstrate various loading configurations of the Oconee emergency power system. The conceptual scope of the six parts of the emergency power ES functional test was provided in Duke's November 21, 1996, letter.

At the time of the November 21, 1996, submittal, the test procedure and data acquisition procedure were still being developed. Duke was also developing a safety evaluation for the test procedures in accordance with 10 CFR 50.59.

The current licensing basis indicates that pre-operational tests were performed and periodic tests are performed on the emergency power system utilizing a single Oconee unit's loads. Since the proposed one-time emergency power ES functional test procedure involves safety equipment on all three Oconee units and is comprised of six separate tests, the test procedure is of a scope that has not been previously described in the licensing basis. A review of the test procedure indicates that there may be a marginal increase in the possibility of a loss of power as compared to the other emergency power tests currently within the licensing basis. Therefore, Duke Power believes the one-time emergency power ES functional test may involve an unreviewed safety question (USQ) which requires prior NRC approval of the test in accordance with 10 CFR 50.90.

The current three unit outage resulted from an unexpected shutdown of Oconee Unit 2 on September 24, 1996. In response to the October 18, 1996, NRC request, and based on the projected duration of the outage, Duke Power assembled a team in October of 1996 to assess the feasibility of conducting a one-time emergency power ES functional test of all three units. Duke Power's safety evaluation of the proposed test has been conducted in parallel with the development of the test procedure. The test is currently scheduled to start on January 2, 1997. A delay in the test will delay the restart of the three Oconee units. NRC approval of this submittal must be obtained prior to January 2, 1997, for Duke Power to perform the one-time emergency power ES functional test during the current outage of all three Oconee units without a delay in startup. Therefore, Duke requests that this submittal be reviewed and approved under an expedited basis in order to support the testing.

In a letter dated December 3, 1996, the NRC requested information about the special considerations that Duke has addressed with respect to shutdown risks during the performance of the test. This included considerations for reactor pressure, reactor coolant temperature, reactor vessel water level, shutdown margin and contingencies. This submittal includes the information that was requested by the NRC in the letter dated December 3, 1996.

This proposed change to the Facility Operating License and our determination of no significant hazards have been reviewed and approved by our 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 Michael Bailey at (864) 885-4390.

Very truly yours,

J. D. Hampton

J. W. Hampton, Site Vice President
Oconee Nuclear Station

MEB

cc: S. D. Ebneter, Regional Administrator
Region II

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

D. E. LaBarge, Project Manager
NRR

M. Batavia,
DHEC

J. W. Hampton, 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.

J W Hampton

J. W. Hampton, Vice President

Subscribed and sworn to before me this 11th day of December, 1996.

Connie M. Breazeale

Notary Public

My Commission Expires:

2-12-2003

ATTACHMENT 1

Description of Change

Chapter 8.3.1.1.6 of the Oconee UFSAR describes the tests and inspections which are routinely performed on the Oconee emergency power system. These tests and inspections are performed on an individual Oconee unit basis rather than simultaneously on all three Oconee units.

In addition, Chapter 14.2 of the Oconee UFSAR outlines the pre-operational tests which were performed on Oconee prior to placing fuel in the reactor core. This chapter describes an engineered safeguards actuation system test that was performed to assure actuation and proper operation of the engineered safeguards system. This pre-operational test was performed on each individual Oconee unit and did not include any impacts from a concurrent three unit test.

Finally, the periodic surveillances contained in the Oconee Technical Specifications do not include any tests which load all three Oconee units on Keowee. The Oconee Technical Specifications include surveillances which test the circuitry and equipment in the proposed one-time emergency power ES functional test. However, the tests utilize an overlapping testing methodology to ensure that the Oconee emergency power system can perform its intended safety function.

Since there may be a marginal increase in the probability of a loss of power as compared to the other emergency power tests in the above paragraphs, Duke is submitting a change to UFSAR Chapter 14 to include the one-time emergency power ES functional test. A copy of the marked up UFSAR page is included in this attachment.

14.2 TESTS PRIOR TO REACTOR FUEL LOADING

The tests prior to reactor fuel loading assure that systems are complete and operate in accordance with design. The test program was divided into two phases: Preheatup Test Phase and Hot Functional Test Phase. In many instances systems were tested during both the Preheatup Test Phase and the Hot Functional Test Phase. A list of the tests performed prior to fuel loading is provided in Table 14-1. This section summarizes the initial test program prior to fuel loading for Oconee 1, 2, and 3. The startup reports and supplements, References 1 on page 14-16 through 14 on page 14-16, provide the results of the startup test program for each unit.

The types of tests are classified as hydro/leak, operational, electrical, and functional with the following definitions for each classification:

Hydro/Leak Test	–	Structural integrity leak test of the various systems and components at the appropriate pressure.
Operational Test	–	Operation of systems and equipment under operating conditions.
Electrical Test	–	Consists of: grounding, megger, continuity, and phasing checks; circuit breaker operation and control checks; potential measurement and energizing of buses and equipment to ensure continuity, circuit integrity, and proper functioning of electrical apparatus.
Functional Test	–	Tests to verify that systems and equipment will function as intended.

Instruments and controls of each system or component were also subjected to a preoperational instrumentation and controls calibration prior to the initial operation of that system or component to assure proper operation.

An Engineered Safeguard Actuation System test was performed to assure actuation and proper operation of the Engineered Safeguards System ~~and to evaluate the test method and frequency for future testing.~~

* See next page for inserted text.

14.2.1 PREHEATUP TEST PHASE

The objective of the Preheatup Test Phase was to assure that the equipment and systems perform as required for hot functional testing. This phase of the testing included certain preoperational calibration, hydro/leak, operational, electrical, and functional tests as required. The Reactor Building Containment System has undergone a structural integrity and integrated leakage rate test to verify the building design and to ensure that leakage is within the design limit.

14.2.2 HOT FUNCTIONAL TEST PHASE

The Hot Functional Test Phase was a period of hot operation of the Reactor Coolant System and the associated auxiliary systems prior to the initial fueling of the reactor. The Reactor Coolant System was heated up to no-load operating pressure and temperature.

The Hot Functional Test Phase continued the preparation toward the initial fuel loading. The objectives of this phase of the test program were:

UFSAR Change to Page 14-7

A one-time emergency power ES functional test which involves the three Oconee units during shutdown conditions has been evaluated. The scope of the test is described in Duke letters to the NRC dated November 21, 1996, and December 11, 1996. This test will verify certain design features of the emergency power system in an integrated fashion. Oconee Unit 3 will be defueled and Oconee Units 1 and 2 will be at cold shutdown with fuel in the reactor core during the performance of the test.

ATTACHMENT 2

Technical Justification

The one-time emergency power ES functional test may result in a marginal increase in the probability of loss of power at Oconee since it involves all three Oconee units and consists of six separate tests. The following information provides a description of the test, a safety analysis of the test, and a shutdown risk assessment of the test. This information indicates that the one-time emergency power ES functional test will not result in any undue risk to the public health and safety.

Test Overview

The electrical portions of this integrated test involve six distinct parts (Tests 1 through 6) which are described later. The first two parts involve loss of offsite power (LOOP) only scenarios. The remaining four parts include simulated loss of coolant accident (LOCA)/LOOP combinations. The Oconee licensing basis is for a LOCA on one Oconee unit concurrent with a LOOP which affects the three Oconee units. Under these conditions, the emergency electrical power systems must satisfy the LOCA loads on one Oconee unit plus the hot shutdown loads of the other two Oconee units.

For the LOOP/LOCA scenarios, 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 pumps will start, all three reactor building cooling units (RBCUs) will start or switch to 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 (PRVS) will start, and containment isolation will occur. In addition, the motor driven emergency feedwater pumps will start as a result of the loss of power.

Emergency core cooling system injection flow will be provided from the borated water storage tank (BWST) to the defueled reactor vessel and into the partially filled transfer canal. The Oconee Unit 3 spent fuel pool (SFP) will be isolated from the transfer canal. In all parts of this test, the procedure addresses restarting additional loads (CCW, SFP cooling, HVAC, etc.) and includes compensatory actions in the event the planned electrical transfer fails.

Test Description

Test #1 Three Oconee LOOP units loading on the Keowee underground path

Test 1 will verify the ability of the Keowee underground power path and unit to handle block loading and unloading. This scenario represents the worst one-time load the system should see, i.e. the LOOP loads of three Oconee units loading at the same time (t = approximately 31 sec). Initially, all three Oconee units will be aligned to their startup transformers with selected loads operating to simulate hot shutdown conditions. In addition, the Keowee units will be started from standstill in this part of the test. All three startup transformers will be deenergized simultaneously with a Keowee emergency start actuation to simulate the LOOP. After approximately 21 seconds, all Oconee units will load shed. At approximately 31 seconds, all Oconee units will block load onto the Keowee underground unit, which will have had time to reach rated speed and voltage. After successful loading on the underground is demonstrated, dead bus transfers back to the unit startup transformers will be performed one Oconee unit at a time.

Test #2 Three Oconee LOOP units loading on the Keowee overhead path after Keowee load rejection and switchyard isolation

Test 2 will verify the ability of the Keowee overhead power path and unit to handle block loading following a maximum permissible load rejection. Again, this LOOP scenario represents the worst one-time load the system should see, i.e. the LOOP loads of the three Oconee units loading at the same time (t = approximately 20 sec). All three Oconee units will initially be aligned to their startup transformers with selected loads operating to simulate hot shutdown conditions. The Keowee overhead unit will be generating to the grid at maximum permissible load. In addition, the Keowee underground unit will initially be running in standby at rated speed with no load. A switchyard isolation will be initiated, resulting in all three startup transformers being deenergized at the same time. Both Keowee units will get an emergency start signal, and the overhead Keowee unit will load reject. Once the Keowee overhead unit's speed has decreased to less than 110% rated (at approximately 20 seconds) all Oconee units will block load onto the Keowee overhead pathway through their startup transformers. After successful loading is demonstrated, the overhead Keowee unit will be synchronized back to the system grid via PCB-8. The Oconee loads will be transferred to the system grid through a live bus transfer. The Keowee unit can then be shutdown and the switchyard returned to normal alignment.

Test #3 Block loading of one Oconee unit's LOCA loads and one Oconee unit's LOOP loads onto an accelerating (i.e. at reduced voltage and frequency) Keowee underground unit

Test 3 will verify the ability of the Keowee underground power path and unit to handle block loading of the Oconee Unit 3 LOCA loads plus Oconee Unit 1 hot shutdown loads while accelerating. This situation represents a single failure where a large unscheduled load starts with the LOCA/LOOP loads. The Oconee Unit 1 hot shutdown loads will represent this large unscheduled load. Oconee Unit 1 will have ES placed in test to simulate the LOCA timing to the emergency power switching logic (EPSL). At the same time, the startup transformers on both Oconee Units 1 and 3 will be deenergized and Oconee Unit 3 will have ES channels 1 through 8 actuated. Both Keowee units will start and accelerate to rated speed and voltage. This scenario will block load the Oconee Unit 1 and 3 loads to the underground unit at approximately 11 seconds. Oconee Unit 2 will be unaffected by this portion of the test. At the conclusion of this test segment, enclosures are provided to restart additional loads, terminate ECCS flow, and perform dead bus transfers back to the respective Oconee startup transformers.

Test #4 Block loading of one Oconee unit's LOCA loads and one Oconee unit's LOOP loads onto a load rejected Keowee underground unit

For Test 4, the same basic sequence described in Test 3 will be performed with the major difference being that the Keowee underground unit will be generating to the system grid at maximum permissible load at the onset of the simulated LOCA/LOOP events. In addition, the overhead Keowee unit will be generating at a low level of 0 - 10 MW. The Keowee units will load reject upon receiving the emergency start signal. At approximately 20 seconds from the event initiation, the Oconee Unit 3 LOCA loads and Oconee Unit 1 LOOP loads will block load onto the underground Keowee unit. Oconee Unit 2 will not be affected by this portion of the test. At the conclusion of this test segment, enclosures are provided to restart additional loads, terminate ECCS flow, and perform dead bus transfers back to the respective Oconee startup transformers.

Test #5 Block loading of a LOCA/LOOP Oconee unit followed by block loading of two Oconee LOOP units on a load rejected Keowee underground unit

For Test 5, initially all three Oconee units will be aligned to their respective startup transformers and the Keowee unit aligned to the underground will be generating to the system grid at maximum permissible load. The Keowee overhead unit will be generating at a low level of 0 - 10 MW. Startup transformers for Oconee Units 1, 2 and 3 will be deenergized and Oconee Unit 3 will have ES channels 1 through 8 actuated to simulate a LOCA/LOOP event. At this time, the Keowee units load reject while the underground breaker opens and then recloses to power the standby bus which subsequently supplies power to the main feeder buses.

For Oconee Units 1 and 2, which are affected only by the simulated LOOP, the Keowee overhead path would normally supply their power. For this test scenario, a failure of the overhead path will be simulated on the Oconee LOOP units. Since there is no ES signal present on Oconee Units 1 and 2, the respective main feeder bus monitor panels begin a 20 second time out. Load shed occurs at approximately 21 seconds and, after a total of approximately 31 seconds, both Oconee LOOP units will be switched to and fed from the underground path.

At the conclusion of this test segment, the Oconee unit startup transformers will be reenergized and the Keowee underground unit will be block unloaded one Oconee unit at a time via dead bus transfers. Tests 5 and 6 represent the greatest total electrical demand to be placed on the emergency power system, but not the greatest single one-time demand because the loads are staggered; i.e., LOCA followed by LOOP.

Test #6 Block loading of a LOCA/LOOP Oconee unit followed by block loading of two Oconee LOOP units on a Lee Gas Turbine

The LOCA/LOOP simulation of Test 5 will be repeated using an operating Lee Gas Turbine to power the standby bus as the emergency power source. The startup transformers for each Oconee unit will be deenergized and Oconee Unit 3 will have ES channels 1 through 8 actuated to simulate a LOCA/LOOP event. In approximately 1 second, a load shed will occur on Oconee Unit 3. At approximately 11 seconds, the standby breaker close initiator allows Oconee Unit 3 to block load onto the Lee Gas Turbine. Since there is no ES signal present on Oconee Units 1 and 2, they are affected only by the simulated LOOP. The main feeder bus monitor panels for Oconee Units 1 and 2 begin a 20 second time out. Load shed occurs at approximately 21 seconds. After a total of approximately 31 seconds, both Oconee LOOP units will be switched to and fed from the Lee Gas Turbine. At the conclusion of this test segment, the Oconee startup transformers will be reenergized, additional loads will be recovered, and the Lee Gas Turbine unit will be block unloaded via dead bus transfers.

Safety Analysis

The electrical power systems, under the alignments described above, will have no adverse impact on plant accident mitigation. Oconee unit trips, LOCA/LOOP scenarios, and most UFSAR analyzed accidents are not postulated for cold shutdown units. During the Keowee loading part of this test, a Lee Gas Turbine will be running in standby and energizing CT5 through a dedicated 100kV line. Likewise, during the Lee Gas Turbine loading, the Keowee units will also be available. The availability of the additional power sources is provided as a conservative measure to ensure that redundant and diverse power sources are available. In addition, the Standby Shutdown Facility (SSF) will be available during the performance of the test. Provisions are also made in the procedure to recover additional loads (CCW, SFP cooling, HVAC, etc.) after each test phase. Since the electrical power and mechanical safety systems for all three Oconee units will be placed in various alignments during the performance of this test, the potential effects and concerns as well as precautions and compensatory actions to be taken, are discussed in detail below.

The purpose of the Oconee emergency power system is to supply a reliable source of emergency power during a design basis event (DBE). The Keowee emergency start logic at Oconee is designed to send a signal to the start circuitry of both Keowee hydro units in the event the normal and startup power sources are not available and/or an engineered safeguards signal is present. Both Keowee units are started automatically and run in standby under any of the following three conditions: (1) undervoltage signals from both main feeder busses, (2) the presence of an ES signal, or (3) a signal from the external grid trouble protection system. The Keowee units are designed to achieve rated speed and voltage within 23 seconds of receipt of an emergency start signal. If the Keowee units are already operating when an emergency start signal is received, they will separate from the Duke grid and run in standby until needed. 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.

Portions of this test place the Oconee units in an alignment that essentially removes the preferred offsite power source from the startup transformers. The overhead path from Keowee would, however, continue to be automatically available through the startup transformers. The risk involved with this alignment is less than that associated with other alignments allowed by Technical Specifications.

The degraded grid protection system (DGPS) monitors the supply voltage on the yellow bus and is one of two systems that provides a switchyard isolate function. The external grid trouble protection system (EGTPS) can also initiate the switchyard isolate signal. Switchyard isolation is a feature of the Oconee electrical system that isolates the switchyard yellow bus from the offsite loads during periods of grid disturbances. Switchyard isolation is accomplished by opening and closing selected switchyard PCBs to isolate the 230KV switchyard yellow bus from the Duke grid. It also provides an automatic path from one of the Keowee units to the three Oconee startup transformers through the isolated yellow bus.

The DGPS will initiate a switchyard isolation upon receipt of a Channel 1 or 2 ES signal in any of the three Oconee units in conjunction with an undervoltage signal sustained for more than 9 seconds on any two out of the three phases on the yellow bus. For the purposes of this test, both the red and yellow buses will remain energized with power being isolated only to the Oconee units' startup transformers during all parts of this procedure except Test 2. For Test 2, the switchyard isolate function will be actuated. The red bus will remain available and energize the normal transformer through a backcharged main stepup transformer. The yellow bus will be isolated and the Oconee loads will be reenergized by Keowee on the overhead path. The switchyard isolation function is routinely tested at Oconee. The DGPS and EGTPS will remain in service and not be adversely affected by this test.

Oconee unit trips, LOCA/LOOP scenarios, and most UFSAR analyzed accidents are not postulated to occur with the Oconee units at cold shutdown. Since all three Oconee units will be shutdown, most analyzed accident scenarios do not apply. In addition, there is no risk of a unit trip or challenge to the reactor protective system (RPS).

Each control room will have an Operations Senior Reactor Operator and two Reactor Operators 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 Emergency Power Engineered Safeguards Functional Test procedure, TT/0/A/0610/025, will be covered in enough detail 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 for performance of the procedure under simulated operating conditions. 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.

Since the Oconee units have been shutdown for greater than 60 days, the decay heat loads are relatively low. Additionally, the vessel head will be removed and nuclear fuel will not be in the core on Oconee Unit 3 when ECCS injection occurs. This arrangement precludes any potential for low temperature overpressurization (LTOP) or fuel assembly/control rod lift.

On Oconee Units 1 and 2 there will be: (1) no ECCS injection into the reactor coolant system (RCS), thus removing the potential for boron dilution (2) no control rod movement, and (3) no core configuration changes. The intentional and controlled interruption of power to the Oconee units' auxiliaries, including decay heat removal (DHR) systems, will have a negligible effect on plant RCS temperature, pressure, and level. Thus, there are no shutdown margin or reactivity management concerns on any unit. Selected License Commitment 16.5.4 addresses the acceptability of stopping DHR for short periods to swap pumps, perform testing, etc. Calculations using the test configuration, actual core data, and no operator action (except for opening the atmospheric dump valves) for Oconee Units 1 and 2 indicate that core boiling will not occur. Based on predicted heat transfer to the two steam generators, the peak temperature will be approximately 220°F at approximately 13.5 hours. Since the RCS will be pressurized by a nitrogen or steam bubble during the test, the reactor coolant will not boil at 220°F. Core uncovery and possible fuel damage is not considered a concern during the performance of this test. In addition, there is no concern of any significant RCS temperature increase on Oconee Units 1 and 2 during the brief periods of time when DHR is interrupted. Conversely, the Oconee Unit 3 RCS temperature will be monitored to ensure it doesn't decrease below 55°F, even though nil ductility concerns are not applicable when the vessel head is detensioned and removed.

The Oconee Unit 3 core will be in the spent fuel pool (SFP), and the time to boil for the SFP in the event of continued loss of cooling is approximately 30 hours. For the Oconee Units 1 and 2 SFP, the time to boil is even longer at approximately 96 hours.

The relatively long times 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. These measures include placing the steam generators on Oconee Units 1 and 2 in reduced wet layup condition so that natural circulation can be initiated. The steam generators can be steamed using atmospheric dump valves to remove decay heat, if necessary. Adequate time is available to manually operate the atmospheric dump valves to remove decay heat.

Approximately 31 seconds after the LOOP or LOCA initiation, all Oconee units will be re-powered by the selected emergency power source. For this test, all Oconee units are shutdown with low decay heat loads and there is no susceptibility to a LOCA on the shutdown units. Additionally, the switchyard will remain energized and available, and can quickly be reconnected to the plant 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 hot shutdown conditions on Oconee Units 1 and 2 during all tests, and on Oconee Unit 3 for Tests 1 and 2.

If there is a loss of normal power sources, 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. The routinely performed EPSL functional test starts certain loads under these reduced voltage and frequency conditions.

The above safety analysis indicates that the one-time 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 the one-time emergency power ES functional test 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 one-time 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 Units 1 and 2

Oconee Units 1 and 2 have fuel in the core and have been shutdown for greater than 60 days. Therefore, decay heat is very low. Actual RCS temperatures are currently approximately 80°F, rather than the 140°F typically assumed in the Loss of DHR abnormal procedure (AP). During the test, both Oconee Units 1 and 2 will have the RCS intact and full with a nitrogen or steam bubble in the pressurizer. The secondary side of the steam generators will be filled to approximately 90% operating range. The motor driven emergency feedwater pumps will be running in recirculation mode to the upper surge tank. Each Oconee unit's LPI system will be in the normal decay heat removal mode with one train in operation using one of the ES pumps. The remaining ES train, along with the non-ES pump ("C"), will be in standby.

The LPSW system will be in service, with two pumps providing flow to various components, including all the decay heat coolers on the two units. The condenser circulating water (CCW) system, which provides water to the LPSW suction header, will be in service with at least three pumps operating per Oconee unit.

When power is transferred by the test scenarios, the components providing DHR will initially lose power. The CCW system will align for gravity flow to assure a suction supply to the LPSW system. The operating LPSW and LPI pumps should be reenergized in approximately 11 to 31 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. If power is restored, but the previously operating components are unavailable, the redundant component will be available for operation. These redundant components will not be challenged or exposed to the transients of the transfer test, and will only be placed in service, as necessary.

Other contingencies for loss of DHR 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).

Calculations using the test configuration, actual core data, and no operator action (except for opening the atmospheric dump valves) for Oconee Units 1 and 2 indicate that core boiling will not occur. Based on the predicted steam generator heat transfer, the peak temperature will be approximately 220°F at approximately 13.5 hours. Since the RCS will be pressurized by a nitrogen or steam bubble during the test, the reactor coolant will not boil at 220°F.

Oconee Unit 3

Oconee Unit 3 will be defueled during this test, therefore loss of DHR in the core is not an issue.

Spent Fuel Pool Cooling

Spent fuel pool (SFP) cooling pumps and the associated recirculating cooling water pumps will lose power during each test scenario. The power will be restored by the test procedure in a timely manner.

The time to boil has been calculated for the Oconee Units 1 and 2 SFP and the Oconee Unit 3 SFP using actual fuel inventory data with conservative initial conditions. Oconee Units 1 and 2 have approximately 96 hours to boil and Oconee Unit 3 has approximately 30 hours to boil. Existing procedures provide contingency guidance for loss of SFP cooling scenarios.

2. RCS Inventory Control

Oconee Units 1 and 2

During the test, both Oconee units will have the RCS intact and full with a nitrogen or steam bubble in the pressurizer. The High Pressure Injection (HPI) system on each Oconee unit will have two pumps operating, but they will be isolated so that only the minimum flow recirculation path will be in use. There will be no seal injection, normal makeup, emergency makeup, or letdown flows. The emergency makeup valves will be closed and deenergized and the PORV will be set to its shutdown setpoint for LTOP protection. Pressurizer and letdown storage tank levels will be monitored to assure that no significant leakage exists which could slowly fill the pressurizer and increase RCS pressure over the duration of the test.

When the power is transferred during the test scenarios, the HPI pumps will initially lose power. The operating HPI pumps should be reenergized in approximately 11 to 31 seconds, depending on the scenario. Following a LOOP, these two pumps are restarted automatically in order to assure seal injection flow to protect the reactor coolant pump seals. In this test, the pumps provide electrical load. As soon as operators verify that the pumps started as expected, the pumps will be shut down.

There are no valves in the HPI, LPI, or RCS systems which are expected to open during this test. Therefore, there are no created flow paths to either drain or fill the RCS. RCS inventory should not change. RCS temperature is also 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 11 to 31 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.

Similarly, the MDEFW pumps will be running in recirculation, and will not supply flow to the steam generators. Therefore, the loss and resumption of emergency feedwater pumps will not cause a heatup or cooldown of the RCS, and

RCS volume will not change due to temperature/density changes. The calculated volume increase due to heat up to boiling would increase pressurizer level from 100 to approximately 180 inches.

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

Oconee Unit 3

This test will be conducted with Oconee Unit 3 defueled and the reactor vessel head removed. Therefore, RCS pressure, temperature, and inventory cannot affect shutdown risk. The RCS will be filled slightly above the vessel flange level such that the fuel transfer canal will be partially filled. During the LOCA scenarios, the Oconee Unit 3 LPI and HPI systems will receive Engineered Safeguards signals and will pump water from the BWST into the reactor vessel and the fuel transfer canal. This will simulate a large break LOCA and will provide useful data to assess the LPI and HPI systems hydraulic models.

The SFP will be isolated from the transfer canal and the BWST such that SFP level cannot be affected. This will be similar to lineups used for routine filling and draining of the canal.

3. Power Availability

No power transfer should result in a loss of power for more than approximately 31 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 all three units on a Keowee unit or Lee Gas Turbine. Some scenarios will subject the underground feeder to more load than prior tests.

From a practical point of view, this test will come closer to the limits of the design basis than prior tests. 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 each Oconee unit's main feeder buses via the normal source (backcharged main auxiliary transformer).

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

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

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

5. Lee Gas Turbine to each Oconee 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 unit 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

Oconee Units 1 and 2

As stated above under "Inventory Control", there are no valves in the HPI, LPI, or RCS systems which are expected to open during this test. Therefore, there are no created flow paths to either drain or fill the RCS. RCS inventory should not change. 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.

Oconee Unit 3

As stated previously, there will be no fuel in the core during this test. The water being injected into the reactor vessel and fuel transfer canal will come from the borated water storage tank (BWST) which is normally used to fill the canal for refueling. Sometime after the test is completed, the fuel transfer canal will be filled for refueling. The boron concentration will be sampled and refueling requirements will be confirmed by the normal refueling procedure prior to final alignment for fuel handling. Therefore, no reactivity changes are expected as a result of this test.

Spent Fuel Pools

No fuel handling activities 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. This will be similar to lineups used for routine filling and draining of the fuel transfer canal. Since the SFP will not be drained or filled during the test, boron dilution is not a concern.

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 each Oconee unit closed.

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

LOCA scenarios will result in Oconee Unit 3 containment isolation valves being aligned in their non-ES positions then moving to their ES (closed) positions. Since there is no fuel in the reactor building, containment integrity is not required. Therefore, no contingency plans are needed in the event component failures prevent containment integrity from being established.

6. Fire Protection

Fire Protection requirements of the Oconee Technical Specifications are applicable at all times. During the transfers, power will be interrupted to the HPSW pumps, including the jockey pump. The test procedure contains provisions for restoring power to the pumps in a timely manner. While the pumps are without power, the elevated water storage tank (EWST) will contain inventory to supply the HPSW system for a period of time. Compensatory actions for loss of fire detection systems will be taken or confirmed as part of this test.

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.

If a fire exists for greater than 15 minutes, the Emergency Plan will require that an "ALERT" be declared.

If a fire (or explosion) damages a component in a system which performs a shutdown risk key safety function, the Emergency Plan will require that an "ALERT" be declared.

8. 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 the one-time emergency power 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 all three Oconee units will already be in a shutdown condition, thus there is no chance of an Oconee unit trip, LOCA/LOOP scenarios and most UFSAR analyzed accident scenarios. 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 all three Oconee units are shutdown during performance of this test, an Oconee unit trip cannot occur. Nothing associated with this test will result in a significant increase in the likelihood of a loss of all system and station power since both Keowee units and the switchyard will remain available. In addition, the gas turbine 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.

   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 SSF diesel, and there is no significant increase in likelihood of a station blackout. The probability of an accident evaluated in the FSAR (LOOP, LOCA, and LOCA/LOOP) will not be significantly increased beyond what has already been evaluated under Technical Specifications.

Calculations using the test configuration, actual core data, and no operator action (except for opening the atmospheric dump valves) for Oconee Units 1 and 2 indicate that core boiling will not occur. Based on the predicted steam generator heat transfer, the peak temperature will be approximately 220°F at approximately 13.5 hours. Since the RCS will be pressurized by a nitrogen or steam bubble during the test, the reactor coolant will not boil at 220°F. Core uncovery and possible fuel damage is not considered a concern during the performance of this test. In addition, there is no concern of any significant RCS temperature increase on Oconee Units 1 and 2 during the short periods when DHR is interrupted. Fuel will be removed from the Oconee Unit 3 core during performance of this test. 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 this analysis and the information presented in Attachment 2, the probability or consequences of an accident previously evaluated will not be significantly increased by the proposed test.

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

No. The emergency power system will remain operable and available to mitigate accidents. All three Oconee units will already be in a shutdown condition, so there is no risk of an Oconee unit trip, challenge to the reactor protective system (RPS), LOCA/LOOP scenarios, and most UFSAR analyzed accident scenarios. Since the Oconee units have been shutdown for greater than 60 days, the decay heat loads are relatively low. Additionally, on Oconee Unit 3, the vessel head will be removed and fuel will not be in the core when ECCS injection occurs. This arrangement precludes any potential fuel assembly/control rod lift or reactivity management concerns.

Preplanning, use of dedicated operators, and independent verification will be employed during critical test phases involving manual manipulation of the 'S' and 'E' breakers. A dedicated technician in contact with the control room will be stationed at the affected cabinet ready to close the appropriate knife switches to re-enable the normal source. These precautions ensure AC power sources are not paralleled. Therefore, based on this analysis and the supporting information in Attachment 2, no new 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, all three Oconee units will be in a shutdown condition, so there is no risk of an Oconee unit trip, challenge to the reactor protective system (RPS), LOCA/LOOP scenarios, and most UFSAR analyzed accident scenarios. Strictly per the Technical Specifications, ECCS and auxiliary power systems are not required with RCS temperature less than 200°F. However, both the emergency power and DHR systems will remain operable during the test. Decay heat removal will only be briefly interrupted during the simulated LOOP portions of the test. Since the Oconee units have been shutdown for greater than 60 days, the decay heat loads are relatively low, and compensatory measures are in place to ensure heat removal capability can be regained in a timely manner. Additionally, the vessel head will be removed and fuel will not be in the core on Oconee Unit 3 when ECCS injection occurs. There is no adverse impact to the fuel, cladding, RCS, or required containment systems. Therefore, based on this analysis and the supporting information in Attachment 2, 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.