UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 2, 1980

Dockets Nos. 50-269, 50-270
and 50-287

Mr. William O. Parker, Jr.
Vice President - Steam Production
Duke Power Company
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Dear Mr. Parker:

The Commission has issued the enclosed Amendments Nos. 82, 82, and 79 for Licenses Nos. DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station, Units Nos. 1, 2 and 3. These amendments consist of changes to the Station's common Technical Specifications and are in response to your submittals dated February 1, 1978, June 12, 1978, October 31, 1978 and August 22, 1979. According to our records, these amendments complete all action requested by your June 12, 1978 application. Partial action on this application was issued July 16, 1979.

These amendments revise the Technical Specifications related to auxiliary electrical systems and emergency power system periodic testing.

During our review, we determined that modifications to your proposed changes were necessary. These changes were discussed with and agreed to by your staff.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Enclosures:
1. Amendment No. 82 to DPR-38
2. Amendment No. 82 to DPR-47
3. Amendment No. 79 to DPR-55
4. Safety Evaluation
5. Notice of Issuance

cc w/enclosures: See next page

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Duke Power Company

cc w/enclosure(s):

Mr. William L. Porter
Duke Power Company
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Oconee Public Library
201 South Spring Street
Walhalla, South Carolina 29691

Honorable James M. Phinney
County Supervisor of Oconee County
Walhalla, South Carolina 29621

Director, Technical Assessment
Division
Office of Radiation Programs
(AW-459)
U. S. Environmental Protection Agency
Crystal Mall #2
Arlington, Virginia 20460

U. S. Environmental Protection Agency
Region IV Office
ATTN: EIS COORDINATOR
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Mr. Francis Jape
U. S. Nuclear Regulatory Commission
P. O. Box 7
Seneca, South Carolina 29678

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
Suite 420, 7735 Old Georgetown Road
Bethesda, Maryland 20014

Manager, LIS
NUS Corporation
2536 Countryside Boulevard
Clearwater, Florida 33515

cc w/enclosure(s) and incoming dtd:
2/1/78, 6/12/78, 10/31/78 & 8/22/79

Office of Intergovernmental Relations
116 West Jones Street
Raleigh, North Carolina 27603

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 82
License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Duke Power Company (the licensee) dated February 1, 1978, and June 12, 1978, as supplemented October 31, 1978, and August 22, 1979, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B of Facility Operating License No. DPR-38 is hereby amended to read as follows:

   3.B Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 82 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 2, 1980

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 82
License No. DPR-47

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Duke Power Company (the licensee) dated February 1, 1978, and June 12, 1978, as supplemented October 31, 1978, and August 22, 1979, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B of Facility Operating License No. DPR-47 is hereby amended to read as follows:

   3.B Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 82 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 2, 1980

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 79
License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Duke Power Company (the licensee) dated February 1, 1978, and June 12, 1978, as supplemented October 31, 1978, and August 22, 1979, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B of Facility Operating License No. DPR-55 is hereby amended to read as follows:

   3.B Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 79 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 2, 1980

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 82 TO DPR-38

AMENDMENT NO. 82 TO DPR-47

AMENDMENT NO. 79 TO DPR-55

DOCKETS NOS. 50-269, 50-270 AND 50-287

Revise Appendix A as follows:

Remove Pages	Insert Pages
3.7-1 through 3.7-2	3.7-1 through 3.7-2
--	3.7-2T
3.7-3 through 3.7-8	3.7-3 through 3.7-9
4.6-1 through 4.6-3	4.6-1 through 4.6-3

Substantive changes on the revised pages are indicated by a marginal line.

3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of offsite and onsite electrical power for station operation and for operation of station auxiliaries.

Objective

To define those conditions of electrical power availability necessary to provide for safe reactor operation and to provide for continuing availability of engineered safety features systems in an unrestricted manner and to prescribe safety evaluation and reporting requirements to be followed in the event that the auxiliary electric power systems become degraded.

3.7.1 Except as permitted by 3.7.2, 3.7.3, 3.7.4, 3.7.5, 3.7.6, and 3.7.7, the reactor shall not be heated above 200°F unless the following conditions are met.

(a) At least two 230kV transmission lines, on separate towers, shall be in service.

(b) Two independent onsite emergency power paths shall be operable and shall consist of:

1. One Keowee hydro unit; through the underground feeder path; through transformer CT4; and to one 4160 volt standby bus.

2. The second Keowee hydro unit; through the overhead path and breaker PCB9; the 230kV switchyard yellow bus; through the respective operating unit's start-up transformer or the aligned and connected alternate startup transformer. One start-up transformer may not be aligned to supply power to more than two units.

(c) Two 4160 volt main feeder buses shall be energized.

(d) The three 4160 volt Engineered Safety Features switchgear buses, three 600 volt load centers, and the three 600-208 volt Engineered Safety Features MCC buses shall be energized.

(e) For each unit, all 125 VDC distribution centers, diode monitors, diodes required to supply the unit's four 125 VDC instrumentation and control panelboards and the 120 VAC auxiliary control power panelboards shall be operable. The 125 VDC instrumentation and control batteries with an associated charger shall be operable as follows:

1. For operation of Unit 1 only, 1CA or 1CB, and 2CA or 2CB
   Unit 2 only, 2CA or 2CB, and 3CA or 3CB
   Unit 3 only, 3CA or 3CB, and 1CA or 1CB

2. For operation of any two units, 1CA or 1CB, 2CA or 2CB, and 3CA or 3CB.

Amendments Nos. 82, 82 & 79

3. For operation of all three units, five of the six batteries with their associated chargers.

(f) Both of the 125 VDC 230kV switching station batteries, with their respective chargers, distribution centers, and panelboards shall be operable.

(g) Both of the 125 VDC Keowee batteries with their respective chargers and distribution centers shall be operable.

(h) The level of Keowee Reservoir shall be at least 775 feet above sea level.

3.7.2 During hot standby or power operation, provisions of 3.7.1 may be modified to allow the following conditions to exist:

(a) One of the two independent onsite emergency power paths, as defined in 3.7.1(b), may be inoperable for periods not exceeding 72 hours for test or maintenance, provided the alternate power path is verified operable within one hour of the loss and every eight hours thereafter.

(b) One 4160 volt main feeder bus may be inoperable for 24 hours.

(c) One complete single string (i.e., 4160 volt switchgear, 600 volt load center, 600-208 volt MCC, and their loads) of each unit's 4160 volt Engineered Safety Features Power System may be inoperable for 24 hours.

(d) One or more of the following DC distribution components may be inoperable for periods not exceeding 24 hours (except as noted in 3.7.2(e) and (f) below):

1. One complete single string or single component (i.e., 125VDC battery, charger, distribution center, and panelboards) of the 125VDC 230 kV Switching Station Power System.

2. One complete single string or single component (i.e., 125VDC battery, charger, and distribution center) of the Keowee 125VDC Power System may be inoperable provided the remaining string of Keowee is operable and electrically connected to an operable Keowee hydro unit.

3. One complete single string or single component (i.e., 125VDC battery, charger, distribution center, and associated isolating and transfer diodes) of any units 125VDC Instrumentation and Control Power System.

4. One 125VDC instrumentation and control panelboard and its associated loads, provided no additional AC buses are made inoperable beyond the provisions of 3.7.2.(a), (b), and (c).

(e) One battery each, from one or more of the following 125VDC systems may be simultaneously inoperable for 72 hours in order to perform an equalizer charge after the surveillance requirements of Specification 4.6.10.

3.7.2T (Temporary Technical Specification)

During hot standby or power operation, provisions of Technical Specification 3.7.1 and 3.7.2 may be modified on a one time basis to allow each of the two switchyard batteries to be removed from service for a period not to exceed 72 hours in order to install upgraded (seismic design) battery racks. Whenever one of the two batteries is removed from service for installation of a battery rack, the other battery and its complete 125 VDC power string (charger, distribution center, and panelboards) must be operable.

When installation of the two racks is completed, this Technical Specification will expire and this temporary page should be removed from the Technical Specifications.

1. 230KV Switching Station 125VDC Power System

2. Keowee Hydro Station 125 VDC Power System

3. Each unit's 125VDC Instrumentation and Control Power System

3.7.3 In the event that the conditions of Specification 3.7.1 are not met within the time specified in Specification 3.7.2, except as noted below in Specification 3.7.4, 3.7.5, 3.7.6, and 3.7.7 the reactor shall be placed in a hot shutdown condition within 12 hours. If these requirements are not met within an additional 48 hours, the reactor shall be placed in the cold shutdown condition within 24 hours.

3.7.4 In the event that all conditions in Specification 3.7.1 are met except that one of the two Keowee hydro units is expected to be unavailable for longer than the test or maintenance period of 72 hours, the reactor may be heated above 200°F if previously shutdown or be permitted to remain critical or be restarted provided the following restrictions are observed.

(a) Prior to heating the reactor above 200°F or prior to the restart of a shutdown reactor or within 72 hours of the loss of one Keowee hydro unit, the 4160 volt standby buses shall be energized by a Lee gas turbine through the 100kV circuit. The Lee gas turbine and 100kV transmission circuit shall be electrically separate from the system grid and offsite non-safety-related loads.

(b) The remaining Keowee hydro unit shall be connected to the underground feeder circuit and this path shall be verified operable within 1 hour and weekly thereafter.

(c) The remaining Keowee hydro unit shall be available to the overhead transmission circuit but generation to the system grid shall be prohibited except for periods of test.

(d) Operation in this mode is restricted to periods not to exceed 45 days and the provisions of this specification may be utilized without prior NRC approval only once in three years for each Keowee hydro unit. Office of Inspection and Enforcement, Region II, will be notified within 24 hours.

3.7.5 In the event that all conditions of Specification 3.7.1 are met except that all 230 kV transmission lines are lost, the reactor shall be permitted to remain critical or be restarted provided the following restrictions are observed:

(a) Prior to the restart of a shutdown reactor or within 1 hour of losing all 230 kV transmission lines for an operating reactor, the 4160 volt standby buses shall be energized by one of the Lee gas turbines through the 100 kV transmission circuit. The Lee gas turbine and the 100 kV transmission circuit shall be completely separate from the system grid and offsite non-safety-related loads.

(b) The reactor coolant T_{avg} shall be above 525°F. Reactor coolant pump power may be used to elevate the temperature from 500°F to 525° in the case of restart. If T_{avg} decreases below 500°F, restart is not permitted by this specification.

(c) If all 230 kV transmission lines are lost, restore at least one of the inoperable 230 kV offsite sources to operable status within 24 hours or be in at least hot standby within the next 6 hours. With only one offsite source restored, restore at least two 230 kV offsite circuits to operable status within 72 hours from time of initial loss or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

(d) After loss of all 230 kV transmission lines, this information shall be reported within 24 hours to the Office of Inspection and Enforcement, Region II. If the outage is expected to exceed 24 hours, a written report shall be submitted detailing the circumstances of the outage and the estimated time to return the 230 kV transmission lines to operating condition.

3.7.6 In the event that all conditions of Specification 3.7.1 are met, and planned tests or maintenance are required which will make both Keowee units unavailable, the 4160 volt standby buses shall first be energized by a Lee gas turbine through the 100 kV transmission circuit and shall be separate from the system grid and offsite non-safety-related loads. The reactor shall then be permitted to remain critical for periods not to exceed 72 hours with both Keowee units unavailable.

Prior to hot restart of a reactor from a tripped condition, the causes and the effects of the shutdown shall be established and analyzed. A restart will be permitted if the cause of such trips are the result of error or of minor equipment malfunctions. A restart will not be permitted if the trip is a result of system transients or valid protection system action.

3.7.7 In the event that all conditions of Specification 3.7.1 are met except that both Keowee hydro units become unavailable for unplanned reasons, the reactor shall be permitted to remain critical for periods not to exceed 24 hours provided the 4160 volt standby buses are energized within 1 hour by the Lee gas turbine through the 100 kV transmission circuit and it shall be separate from the system grid and all offsite non-safety-related loads.

Prior to hot restart of a reactor from a tripped condition, the causes and the effects of the shutdown shall be established and analyzed. A restart will be permitted if the cause of such trips are the result of error or of minor equipment malfunctions. A restart will not be permitted if the trip is a result of system transients or valid protection system action.

3.7.8 Any degradation beyond Specification 3.7.2, 3.7.4, 3.7.5, 3.7.6, or 3.7.7 above shall be reported to the Office of Inspection and Enforcement, Region II, within 24 hours. A safety evaluation shall be performed by Duke Power Company for the specific situation involved which justifies the safest course of action to be taken. The results of this evaluation together with plans for expediting the return to the unrestricted operating conditions of Specification 3.7.1 above shall be submitted in a written report to the Office of Nuclear Reactor Regulation with a copy to the Office of Inspection and Enforcement, Region II, within five days.

Bases

The auxiliary electrical power systems are designed to supply the required Engineered Safeguards loads in one unit and safe shutdown loads of the other two units and are so arranged that no single contingency can inactivate enough engineered safety features to jeopardize plant safety. These systems were designed to meet the following criteria:

> "Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity and testability to permit the functions required of the engineered safety features of each unit."

The auxiliary power system meets the above criteria and the intent of AEC Criterion 17. The adequacies of the AC and DC systems are discussed below as are the bases for permitting degraded conditions for AC power.

Capacity of AC Systems

The auxiliaries of two units in hot shutdown (6.0MVa each) plus the auxiliaries activated by ESG signal in the other unit (4.8 MVa) require a total AC power capacity of 16.8 MVa. The continuous AC power capacity available from the on-site power systems (Keowee hydro units) is 20 MVa (limited by transformer CT4) if furnished by the underground circuit or 30 MVa (limited by CT1 or CT2) if furnished through the 230 kV offsite transmission lines. Capacity available from the backup 100 kV offsite transmission line (Lee Station Gas Turbine Generator) is 20 MVa (limited by CT5).

Thus, the minimum available capacity from any one of the multiple sources of AC power, 20 MVa, is adequate.

Capacity of DC Systems

Normally, for each unit AC power is rectified and supplies the DC system buses as well as keeping the storage batteries on these buses in a charged state. Upon loss of this normal AC source of power, each unit's DC auxiliary systems important to reactor safety have adequate stored capacity (ampere-hours) to independently supply their required emergency loads for at least one hour. One hour is considered to be conservative since there are redundant sources of AC power providing energy to these DC auxiliary systems. The loss of all AC power to any DC system is expected to occur very infrequently, and for very short periods of time. The following tabulation demonstrates the margin of installed battery charger rating and battery capacity when compared to one hour of operation (a) with AC power (in amps) and (b) without AC power (in ampere hours) for each of the three safety-related DC systems installed at Oconee:

A. 125 VDC Instrumentation and Control Power System

Charger XCA, XCB, or XCS	a.	600 amps each
Battery XCA or XCB Capacity (X = 1, 2, or 3)	b.	600 ampere-hours each
Combined total connected loads on both 125 VDC I & C buses XDCA and XDCB during 1st hour of LOCA (x = 1, 2, or 3)	a.	Inrush (2 sec) - 1160 amps next 59 min. - 506 amps
	b.	516.9 ampere-hours

B. 125 VDC Switching Station Power System

Charger SY-1, SY-2, or SY-s Rating	a.	50 amps each
Battery SY-1 or SY-2, Capacity	b.	14.4 ampere-hours
Active load per battery during 1st hour of LOCA	a.	Inrush (2 seconds) - 130 amps next 59 min. - 10 amps
	b.	12 ampere-hours

C. 125 VDC Keowee Station Power System

Charger No. 1, No. 2 or Standby Rating	a.	200 amps each
Battery No. 1 or No. 2 Capacity	b.	200 ampere-hours
Active load per battery during 1st hour of LOCA	a.	Inrush (14 seconds) - 1031 amps next 59 min. - 179.4 amps
	b.	193.6 ampere-hours

Redundancy of AC Systems

There are three 4160 V engineered safety features switchgear buses per unit. Each bus can receive power from either of the two 4160 V main feeder buses per unit. Each feeder bus in turn can receive power from the 230 kV switchyard through the startup transformers, through the unit auxiliary transformer by backfeeding through the main step-up transformer, or from the 4160V standby bus. Another unit's start-up transformer serving as an alternate supply can be placed in service in one hour.

The standby bus can receive power from the hydro station through the underground feeder circuit or from a combustion turbine generator at the Lee steam station over an isolated 100 kV transmission line. The 230 kV switchyard can receive power from the onsite Keowee hydro station or from several offsite sources via transmission lines which connect the Oconee station with the Duke Power system power distribution network.

Redundancy of DC Systems

A. 125 VDC Instrumentation and Control Power System

The 125 VDC Instrumentation and Control (I&C) Power System consists of two batteries, three battery chargers, and two I&C distribution centers per unit. All reactor protection and engineered safety features loads on this system can be powered from either the Unit 1 and Unit 2 or the Unit 2 and Unit 3 or the Unit 3 and Unit 1 125 VDC I&C distribution centers. The 125 VDC I&C distribution centers are normally supplied from their associated battery and charger. For one unit, in the event that only one of its batteries and associated chargers are operable, both I&C distribution centers will be tied together allowing operation of the DC loads from the unit's operable battery and charger. As shown above, one I&C battery (e.g., ICA) can supply both I&C distribution centers (e.g., IDCA and IDCB) and their associated panelboard loads. Also, one of the three battery chargers for each unit can supply all connected ESF and reactor protection loads.

B. 125 VDC Switching Station Power System

There are two essentially independent subsystems each complete with an AC/DC power supply (battery charger), a battery bank, a battery charger bus, motor control center (distribution panel). Except for the support racks for the batteries, all safety-related equipment and the relay house in which it is located are seismic Category I design. The support racks for the batteries will be upgraded to seismic Category I as soon as possible. Each sub-system provides the necessary DC power to:

a. Continuously monitor operations of the protective relaying,

b. Isolate Oconee (including Keowee) from all external 230 kV grid faults,

c. Connect onsite power to Oconee from a Keowee hydro unit, or

d. Restore offsite power to Oconee from non-faulted portions of the external 230 kV grid.

Provisions are included to manually connect a standby battery charger to either battery/charger bus.

C. 125 VDC Keowee Station Power System

There are essentially two independent physically separated seismic Category I subsystems, each complete with an AC/DC power supply (charger) a battery bank, a battery/charger bus and a DC distribution center. Each subsystem provides the necessary power to automatically or manually start, control and protect one of the hydro units.

An open or short in any one battery, charger of DC distribution center, cannot cause loss of both hydro units.

The 230 kV sources, while expected to have excellent availability, are not under the direct control of the Oconee station and, based on past experience, cannot be assumed to be available at all times. However, the operation of the onsite hydro-station is under the direct control of the Oconee station and requires no offsite power to startup. Therefore, an onsite backup source of auxiliary power is provided in the form of twin hydro-electric turbine generators powered through a common penstock by water taken from Lake Keowee. The use of a common penstock is justified on the basis of past hydro plant experience of the Duke Power Company (since 1919) which indicates that the cumulative need to dewater the penstock can be expected to be limited to about one day a year, principally for inspection, plus perhaps four days every tenth year.

Operation with one Keowee hydro unit out of service for periods less than 72 hours is permitted. The operability of the remaining Keowee hydro unit is verified within one hour by starting the unit and energizing the standby buses through the underground feeder circuit. This action is repeated once every eight hours thereafter until the Keowee hydro unit is restored to service and will provide additional assurance of the operability of the remaining unit.

Provisions have been established for those conditions in which long term preventative maintenance of a Keowee hydro unit is necessary. The primary long term maintenance items are expected to be hydro turbine runner and discharge ring welding repairs which are estimated to be necessary every six to eight years. Also, generator thrust and guide bearing replacements will be necessary. Other items which manifest as failures are expected to be extremely rare and could possibly be performed during the permitted maintenance periods. Time periods of up to 45 days for each Keowee hydro unit are permitted every three years. During these outages the remaining Keowee hydro unit will be verified to be operable within one hour and weekly thereafter by starting the unit and energizing the underground feeder circuit. The remaining Keowee hydro unit will also be available through the overhead transmission path and will not be used for system peaking. Additionally, the standby buses will be energized continuously by one of the Lee gas turbines through the 100 kV transmission circuits.

This transmission circuit would be electrically separated from the system grid and all offsite non-safety-related loads. This arrangement provides a high degree of reliability for the emergency power systems.

Operation with both Keowee hydro units out of service is permitted for planned or unplanned outages for periods of 72 or 24 hours respectively. Planned outages are necessary for the inspection of common underwater areas such as the penstock and to enable the removal of one Keowee unit from service. This would be a controlled evolution in which the availability and condition of the offsite grid, startup transformers and weather would be evaluated and a Lee gas turbine would be placed in operation on the isolated 100 kV transmission line prior to commencement of the outage.

A time period of 24 hours for unplanned outages of both Keowee units is acceptable since a Lee gas turbine will be started within one hour and will energize the standby buses through the dedicated 100 kV transmission line. This period of time is reasonable to determine and rectify the situation which caused the loss of both Keowee units.

In the event that none of the sources of offsite power are available and it is considered important to continue to maintain an Oconee reactor critical or return it to criticality from a hot shutdown condition, one of the Lee gas turbines can be made available as an additional backup source of power, thus assuring continued availability as an auxiliary power to perform an orderly shutdown of a unit should a problem develop requiring shutdown of both hydro units.

4.6 EMERGENCY POWER PERIODIC TESTING

Applicability

Applies to the periodic testing surveillance of the emergency power sources.

Objective

To verify that the emergency power sources and equipment will respond promptly and properly when required.

Specification

4.6.1 Monthly, a test of the Keowee hydro units shall be performed to verify proper operation of these emergency power sources and associated equipment. This test shall assure that:

a. Each hydro unit can be automatically started from the Unit 1 and 2 control room.

b. Each hydro unit can be synchronized through the 230 kV overhead circuit to the startup transformers.

c. Each hydro unit can energize the 13.8 kV underground feeder.

d. The 4160 volt startup transformer main feeder bus breakers and standby bus breaker shall be exercised.

4.6.2 a. Annually, the Keowee hydro units will be started using the emergency start circuits in each control room to verify that each hydro unit and associated equipment is available to carry load within 25 seconds of a simulated requirement for engineered safety features.

b. Promptly following the above annual test, each hydro unit will be loaded to at least the combined load of the auxiliaries actuated by ESG signal in one unit and the auxiliaries of the other two units in hot shutdown by synchronizing the hydro unit to the offsite power system and assuming the load at the maximum practical rate.

4.6.3 Monthly, the Keowee Underground Feeder Breaker Interlock shall be verified to be operable.

4.6.4 Annually, a simulated emergency transfer of the 4160 volt main feeder buses to the startup transformer (i.e., CT1, CT2 or CT3) and to the 4160 volt standby buses shall be made to verify proper operation.

4.6.5 Quarterly, the External Grid Trouble Protection System logic shall be tested to demonstrate its ability to provide an isolated power path between Keowee and Oconee.

4.6.6 Annually and prior to planned extended Keowee outages, it shall be demonstrated that a Lee station combustion turbine can be started and connected to the 100 kV line. It shall be demonstrated that the 100 kV line can be separated from the rest of the system and supply power to the 4160 volt main feeder buses.

4.6.7 Annually, it shall be demonstrated that a Lee station combustion turbine can be started and connected to the isolated 100 kV line and carry the equivalent of the maximum safeguards load of one Oconee unit (4.8 MVA) within one hour.

4.6.8 Annually, it shall be demonstrated that a Lee station combustion turbine can be started and carry the equivalent of the maximum safeguards load on one Oconee unit plus the safe shutdown loads of two Oconee units on the system grid.

4.6.9 Batteries in the Instrumentation and Control, Keowee, and Switching Station shall have the following periodic inspections performed to assure maximum battery life. Any battery or cell not in compliance with these periodic inspection requirements shall be corrected to meet the requirements within 90 days or the battery shall be declared inoperable.

a. Weekly verify that:

(1) The electrolyte level of each pilot cell is in between the minimum and maximum level indication marks.

(2) The pilot cell specific gravity, corrected to $77^{\circ}F$ and full electrolyte level, is $\geq$ 1.200.

(3) The pilot cell float voltage is $\geq$ 2.12 VDC.

(4) The overall battery float voltage is $\geq$ 125 VDC.

b. Quarterly verify that:

(1) The specific gravity of each cell corrected to $77^{\circ}F$ and full electrolyte level, is $\geq$ 1.200 and is not less than 0.010 below the average of all cells measured.

(2) The voltage of each cell under float charge is $\geq$ 2.12 VDC.

(3) The electrolyte level of each connected cell is between the minimum and maximum level indication marks.

c. Annually verify that:

(1) The cells, end-cell plates and battery racks show no visual indication of structural damage or degradation.

(2) The cell to cell and terminal connections are clean, tight and coated with anti-corrosion grease.

4.6.10 Annually, a one hour discharge service test at the required maximum load shall be made on the instrument and control batteries, the Keowee batteries, and the switching station batteries.

4.6.11 Monthly, the operability of the individual diode monitors in the Instrument and Control Power System shall be verified by imposing a simulated diode failure signal on the monitor.

4.6.12 Semiannually, the peak inverse voltage capability of each auctioneering diode in the 125 VDC Instrument and Control Power System shall be measured and recorded.

Bases

The Keowee hydro units in addition to serving as the emergency power sources for the Oconee Nuclear Station, are power generating sources for the Duke system requirements. As power generating units, they are operated frequently, normally on a daily basis at loads equal to or greater than required by Table 8.5 of the FSAR for ESF bus loads. Normal as well as emergency startup and operation of these units will be from the Oconee Unit 1 and 2 Control Room. The frequent starting and loading of these units to meet Duke system power requirements assures the continuous availability for emergency power for the Oconee auxiliaries and engineered safety features equipment. It will be verified that these units will carry the equipment of the maximum safeguards load within 25 seconds, including instrumentation lag, after a simulated requirement for engineered safety features. To further assure the reliability of these units as emergency power sources, they will be, as specified, tested for automatic start on a monthly basis from the Oconee control room. These tests will include verification that each unit can be synchronized to the 230 kV bus and that each unit can energize the 13.8 kV underground feeder.

The interval specified for testing of transfer to emergency power sources is based on maintaining maximum availability of redundant power sources.

Starting a Lee station gas turbine, separation of the 100 kV line from the remainder of the system, and charging of the 4160 volt main feeder buses are specified to assure the continuity and operability of this equipment. The one hour time limit is considered the absolute maximum time limit that would be required to accomplish this.

REFERENCE

FSAR Section 8

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 82 TO FACILITY OPERATING LICENSE NO. DPR-38

AMENDMENT NO. 82 TO FACILITY OPERATING LICENSE NO. DPR-47

AMENDMENT NO. 79 TO FACILITY OPERATING LICENSE NO. DPR-55

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS NOS. 1, 2 AND 3

DOCKETS NOS. 50-269, 50-270 AND 50-287

I. INTRODUCTION

The Duke Power Company (the licensee), by letters dated February 1, 1978, June 12, 1978, October 31, 1978, and August 22, 1979, submitted proposed changes to the Technical Specifications (TSs) related to the auxiliary electrical systems and emergency power system periodic testing for Oconee Nuclear Station, Units Nos. 1, 2 and 3 (ONS 1, 2 and 3). The proposed changes would:

1. More clearly define the onsite emergency power transmission paths,

2. Provide flexibility in the limiting conditions for operation (LCO) of the 125 Vdc systems,

3. Permit one of the two independent onsite emergency power paths to be inoperable for a period of 72 hours for test or maintenance,

4. Increase the time allowed from 24 to 72 hours for one battery in a 125 Vdc system to be inoperable for equalizer charge following a discharge test,

5. Permit removal of each switchyard battery for 72 hours in order to install seismic design battery racks,

6. More accurately describe the dc system loads, and

7. Modify the annual testing surveillance requirements for the emergency power systems to permit demonstration that the systems are available to and capable of carrying the required load rather than require actual application of engineered safety feature (ESF) loads

II. BACKGROUND

The offsite power system (see ONS Final Safety Analysis Report (FSAR) Figure 8-2) for ONS 1, 2 and 3 consists of six 230 kV transmission lines to the 230 kV station

switchyard and two 500 kV transmission lines to a 500 kV switchyard. The 500 kV switchyard is connected to the 230 kV switchyard via an auto transformer. Offsite power is available to each of the three Oconee units via 230/4.16 kV startup transformers. The switchyards are arranged in breaker-and-a-half configuration and each circuit breaker is provided with dual trip coils supplied from 125 Vdc station switching power systems which are independent from the Oconee units' Class 1E dc systems. The circuit protection is provided by redundant relaying.

Onsite power is provided by two 87.5 MVA hydroelectric generators. This power is available either through the 230 kV switchyard and the 45/60 MVA startup transformers or through a 13.8 kV underground feeder which utilizes its own 12/16/20 MVA transformer (Transformer No. CT4) and supplies two 4160 V main feeder buses in each of the three units. The maximum emergency power demand upon initiation of accident conditions would be 4.8 MVA per unit.

Three divisional 4.16 kV buses per unit are provided for ESF loads. The divisional buses of each unit can be connected to either of their respective 4.16 kV main feeder buses. The sources of power which are automatically connected to the main feeder buses, in the order that they are connected, are:

1. The 230 kV switchyard via each unit's startup transformer,

2. The preselected hydro unit via the 13.8 kV underground feeder and the station's standby buses, and

3. The other hydro unit via a 230 kV overhead line, the 230 kV switchyard and each unit's startup transformer.

Also, the following sources of power or startup transformers can be made available manually:

1. One of the gas turbines located 30 miles away at the Lee Steam Station via an independent overhead 100 kV transmission system and the station's standby buses, and

2. The three startup transformers can be cross connected via the station's emergency startup buses.

The use of the Keowee Hydro Station and power supply transmission lines including transformers which have been under the direct control of the ONS was originally reviewed and found acceptable as the standby emergency power supply for the ONS during the operating license review.

III. ACCEPTANCE CRITERIA

The criteria applied in determining the acceptability of the TS changes for the ac and dc onsite power supply systems are:

1. General Design Criterion (GDC 17), "Electrical Power Systems," of Appendix A, 10 CFR Part 50;

2. IEEE Std. 308-1974, "Class 1E Power Systems for Nuclear Power Generating Stations";

3. IEEE Std. 338-1975, "Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems";

4. 10 CFR Part 50, Section 50.36 (c) (2), "Limiting Conditions for Operation";

5. Regulatory Guide 1.93, "Availability of Electric Power Sources";

6. Regulatory Guide 1.108, "Periodic Testing of Diesel Generators Used as Onsite Electric Power Systems at Nuclear Power Plants"; and

7. Regulatory Guide 1.6, "Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution System".

IV. EVALUATION

1. The proposed change to Section 3.7.1(c) of the TSs would improve the definition of the two emergency power supply systems to more precisely describe the components in the two emergency power paths. One path consists of the Keowee hydro unit, the underground feeder, transformer CT 4, and a 4160 V standby bus. The other path consists of the second Keowee hydro unit, a 230 kV overhead line, breaker PCB 9, and the 230 kV switchyard yellow bus, through each operating unit's startup transformer or the aligned and connected alternate startup transformer. The two paths are independent and redundant and are in accordance with IEEE 308-1974, Section 5.2.4(1) which states "the standby power supply shall consist of all components from the stored energy to the connection to the distribution system's supply circuit breaker."

   Each 4160 V main feeder bus of each unit can receive power from the 230 kV switchyard through the unit's startup transformer, through the aligned and connected alternate startup transformer or through the unit's auxiliary transformer back-fed from the main step-up transformer. The 4160 V main feeder bus for each unit can also receive power from the 4160 V standby bus through the 13.8 kV underground feeder supplying transformer CT 4.

   Additionally, Specification 3.7.1(g) would be renumbered 3.7.1(e) and revised to allow operation utilizing the redundancy present in the 125 Vdc Instrumentation and Control System (I&C). The 125 Vdc I&C power system consists of two batteries, three battery chargers, and two I&C distribution centers per unit. Each of the 125 Vdc I&C distribution (e.g., IDCA or IDCB) centers is normally supplied power from its associated battery charger. One I&C battery and associated charger, however, is capable of supplying two I&C control distribution centers (e.g., IDCA and IDCB) and their associated panel board loads. All reactor protection and ESF loads on this system can be powered from either the Units 1 and 2, Units 2 and 3 or Units 3 and 1, 125 Vdc I&C distribution centers (see FSAR Figure 8-5). Thus, a maximum of only five I&C batteries, with their respective chargers are required to be operable if all three reactors are operating.

The proposed changes to TS 3.7.1 would satisfy the installed redundancy and single failure criteria of Regulatory Guide 1.6, Position D.1, "The electrically powered safety loads (ac and dc) should be separated into redundant load groups such that loss of any one group will not prevent the minimum safety functions." We find the proposed changes to Section 3.7.1 acceptable.

2. The proposed changes to Section 3.7.2(a) through (g) of the TSs would provide the LCO on a complete string of power supply, as is done in the current Standard TSs, rather than on individual components of the ac and dc power supply systems. The changes would incorporate the definition of the onsite standby power paths in Specification 3.7.1. The licensee's proposals would provide more stringent LCO than the LCO in the current TSs.

   Allowance would also be made for specific test operations associated with 125 Vdc systems. When the annual discharge test is performed on each battery, the accompanying equalizer battery charges require 48 hours more than the 24 hours currently authorized for inoperability in 125 Vdc systems. The battery charger can supply all connected ESF and reactor protection steady state loads while its battery is returned to or maintained in equalizing charge. The battery discharge service test does not affect adversely the capability and availability of the 125 Vdc system during the subsequent 72 hours when the battery is on equalizing charge. We find the proposed changes to Specification 3.7.2 acceptable.

3. The licensee proposed to change the descriptions of the capacity of dc systems discussed in the bases to Section 3.7 in order to provide the actual maximum load conditions of the dc system capacity. The actual load condition shown in the revised discussion of the basis for the dc capacity is lighter and more practical than that stated in the current TSs. The changes would better define the actual margin in dc capacity. We find these changes acceptable.

4. The proposed changes to Sections 4.6.9 through 4.6.12 of the TSs regarding the periodic surveillance testing for the batteries would improve the surveillance in terms of test procedures. The surveillance requirements would comply with the criteria of IEEE Std. 450 and Regulatory Guide 1.32. Therefore, we find the proposed changes acceptable.

5. The proposed change to Section 4.6.2 would require a test of the entire emergency underground power path from Keowee hydro unit to verify, without actually supplying the ESF loads, that the unit would be available to carry and be capable of carrying ESF loads of a shutdown within 25 seconds of a requirement for the ESF. Promptly (within a few minutes) following the above test, the hydro unit would be loaded to at least the combined load of the auxiliaries actuated by ESF signal in one unit and the auxiliaries of the other two units in hot shutdown by synchronizing the hydro unit to the offsite power system and assuming the load at the maximum practical rate. The current TS 4.6.2 requires that a Keowee hydro unit actually

carry the equivalent of the maximum safeguards load of one unit within 25 seconds of a simulated requirement for ESF. Under a postulated requirement for emergency power, each Keowee hydro unit is capable of starting and providing necessary power within 25 seconds. If the test were accomplished with a unit shutdown and all of the systems associated with the unit were fully operational, there still would not be sufficient load to run the test. It is not possible to provide the required load within 25 seconds for the test without adverse impact on the operating units. (The test could not be accomplished with a unit operating without causing a reactor trip to occur.) Based on IEEE 338-1975, Standard Criteria for Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems, Section 6(2), "the overlap tests are permitted where full functional tests are not practical," the sequential tests and overlap tests are acceptable. Furthermore, each hydro unit is started and operated daily at power levels in excess of the worst case requirements of the ONS. The licensee has informed us orally that starting times of 17 to 19 seconds (however loads are not applied within this time) are typically experienced during these operations. In addition to these daily operations, the automatic controls of the 230 kV switchyard have been qualified as Class 1E and are tested annually for proper operation of the 230 kV switchyard breakers. Therefore, we find that the proposed changes to the TSs which require that the Keowee hydro unit be verified to be capable of carrying and available to carry to the ESF load of a shutdown unit on 4160 V emergency buses within 25 seconds of a simulated requirement for ESF, are acceptable.

6. The licensee proposed to modify the TSs to permit a one time exception to Sections 3.7.1 and 3.7.2 in order to replace the nonseismic design switchyard battery support structures with seismic Category I design support structures. Specifically, the licensee has proposed that each of the two switchyard batteries be allowed to be taken out of service for a period of time not to exceed 72 hours in order to allow sufficient time to make this installation. This is an extension of 48 hours beyond the present TS limit of 24 hours.

   Installation of the seismic Category I design support structure will improve the probability that the 125 Vdc switchyard power system will remain operable following an earthquake. Further, only one of the batteries will be inoperable at a given time and the other battery and its power string will be checked to assure that it is operable immediately prior to removing a battery from service. We find that the improved capability of the supports to withstand earthquakes warrants the 48 hour extension of battery down time to allow the installation. We have made the TS a temporary one, 3.7.2T (Temporary), which will expire as soon as both new supports are installed.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: May 2, 1980

VI. REFERENCES

1. 10 CFR 50, Appendix A, General Design Criterion 17, Electrical Power System.
2. 10 CFR 50, Section 50.36(c)(2) Limiting Conditions for Operation.
3. IEEE Std. 308-1974, IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations.
4. IEEE Std. 450-1975, IEEE Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.
5. Regulatory Guide 1.93, Availability of Electric Power Sources, dated December 1974.
6. ONS TSs, Section 3.7 and 4.6.
7. Letter from Mr. W. O. Parker, Jr. (DPC) to Mr. E. G. Case (NRC) dated February 1, 1978.
8. Letter from Mr. W. O. Parker, Jr. (DPC) to Mr. E. G. Case (NRC) dated June 12, 1978.
9. Letter from Mr. W. O. Parker, Jr. (DPC) to Mr. H. R. Denton (NRC) dated October 31, 1978.
10. Letter from Mr. W. O. Parker, Jr. (DPC) to Mr. H. R. Denton (NRC) dated August 22, 1979.
11. FSAR - Oconee Units 2 and 3.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKETS NOS. 50-269, 50-270 AND 50-287

DUKE POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 82 , 82, and 79 to Facility Operating Licenses Nos. DPR-38, DPR-47 and DPR-55, respectively, issued to Duke Power Company, which revised the Technical Specifications for operation of the Oconee Nuclear Station, Units Nos. 1, 2 and 3, located in Oconee County, South Carolina. The amendments are effective as of the date of issuance.

These amendments revise the Station's Common Technical Specifications related to auxiliary electrical systems and emergency power system periodic testing.

The applications for the amendments comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

For further details with respect to this action, see (1) the applications for amendments dated February 1, 1978, and June 12, 1978, as supplemented October 31, 1978, and August 22, 1979, (2) Amendments Nos. 82, 82, and 79 to Licenses Nos. DPR-38, DPR-47 and DPR-55, respectively, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Oconee County Library, 201 South Spring Street, Walhalla, South Carolina. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 2nd day of May 1980.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors