January 15, 199

Mr. W. R. McCollum
Vice President, Oconee Site
Duke Energy Corporation
P. O. Box 1439
Seneca, SC 29679

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - OCONEE EMERGENCY ELECTRICAL DISTRIBUTION SYSTEM REPORT (TAC NO. M93550)

Dear Mr. McCollum:

During our review of the Oconee Nuclear Station Emergency Electrical Distribution System in preparation for a report being prepared by the NRC's Office of Nuclear Reactor Regulation, the staff has identified the need for additional information. We request that you provide the information requested in the enclosure within 30 days of the date of this letter.

Sincerely,

ORIGINAL SIGNED BY:

David E. LaBarge, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

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

Enclosure: Request for Additional Information

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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Oconee Nuclear Station

cc:
Mr. Paul R. Newton
Legal Department (PBO5E)
Duke Energy Corporation
422 South Church Street
Charlotte, North Carolina 28242

J. Michael McGarry, III, Esquire
Winston and Strawn
1400 L Street, NW.
Washington, DC 20005

Mr. Robert B. Borsum
Framatome Technologies
Suite 525
1700 Rockville Pike
Rockville, Maryland 20852-1631

Manager, LIS
NUS Corporation
2650 McCormick Drive, 3rd Floor
Clearwater, Florida 34619-1035

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
7812B Rochester Highway
Seneca, South Carolina 29672

Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, S.W., Suite 23T85
Atlanta, Georgia 30303

Max Batavia, Chief
Bureau of Radiological Health
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

County Supervisor of Oconee County
Walhalla, South Carolina 29621

Mr. J. E. Burchfield
Compliance Manager
Duke Energy Corporation
Oconee Nuclear Site
P. O. Box 1439
Seneca, South Carolina 29679

Ms. Karen E. Long
Assistant Attorney General
North Carolina Department of Justice
P. O. Box 629
Raleigh, North Carolina 27602

L. A. Keller
Manager - Nuclear Regulatory Licensing
Duke Energy Corporation
526 South Church Street
Charlotte, North Carolina 28242-0001

Mr. Richard M. Fry, Director
Division of Radiation Protection
North Carolina Department of Environment, Health, and Natural Resources
3825 Barrett Drive
Raleigh, North Carolina 27609-7721

Request for Additional Information

Oconee Nuclear Station Emergency Electrical Distribution System

The following questions refer to the October 31, 1996, letter from Duke Energy Corporation (Duke), "Response to NRR and AEOD Draft Reports on the Oconee Emergency Power System."

1. In response to Open Issue 14, Duke responded that emergency start procedure (AP/O/A/200/2) was written to address failures of the relays and breakers associated with the Keowee power supplies. Duke then stated that all Oconee operators (licensed and nonlicensed) have been trained in the use of this procedure. Is the roving watch operator also trained in this procedure?

2. In response to Open Issue 17, Duke stated that a review of the various Keowee procedures that would take the underground path or both Keowee units out of service was conducted. Two procedures were identified that would take longer than one shift: the unwatering and watering-up Keowee units procedures (OP/O/A/2000/038) and the underground power path procedures (OP/O/A/2000/038). How long do these procedures take to complete? How often are they performed? When are they performed (i.e., during refueling outages)? Maintenance unavailability from performing these two procedures was not included in Table C.1-6, Keowee Probabilistic Risk Assessment (PRA) Train and Component Maintenance/Testing Events.

3. Concerning the response to Open Issue 34, is the probability distribution provided in Attachment 6 an uncertainty distribution for KEOWTOP substituting generic data except for the 50 out of 1135 events where generic data is not available?

4. In Open Issue 35, the staff raised concerns regarding the applicability of grid generation experience for components that operate differently during an emergency start compared to a normal start. In Open Issue 9, Duke identified eight components that operate differently during an emergency start than during a normal start: the field breaker, the field flashing breaker, the supply breaker, the voltage regulator, synchronizer operation, the compensating dashpot, the partial shutdown solenoid, and the gate limit. Many of these components are required to generate and maintain generator voltage (part of the generator excitation system modeled in Appendix A.6 of the Keowee PRA). It appears that the failure rates for these components were quantified with grid generation start demands and emergency start demands versus just emergency start demands. The staff also recognizes that there were approximately 6000 normal starts versus 113 emergency starts reported in the Keowee PRA. The staff also noted that many basic events involving these eight components were quantified as undeveloped events since no applicable generic data existed. The staff also reviewed Table C.1-1, "Keowee PRA Component Failures Sorted By Type Code" and noted that many of the emergency start failures listed in this table involve these eight components. From these concerns, the staff has the following questions.

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a. The staff believes that only emergency start data is applicable to estimate the failure probabilities involving these eight components. Therefore, the staff believes that the Keowee PRA should be requantified using emergency start data for these eight components. The staff notes that these components perform similarly in a normal start compared to an emergency start. However, subtle differences in emergency operation of their subcomponents can yield unique failures that could be undetected during a normal start. As an example, the staff requests that Duke consider the failure of Keowee Unit 1 to achieve rated voltage following an emergency start signal on June 20, 1997, that resulted from a blown fuse in the field flash breaker control circuit. As described in the associated Augmented Inspection Team report, the field flash circuit breaker control circuitry is suspected to have failed from component interactions between the 53-31T overvoltage relay and the breaker close coil when it was in an energized state going to the "trip free" mode of operation. The staff notes that this overvoltage relay is not activated during normal starts.

b. As a continuation of question 4a, the staff also requests a list of all basic events that have the potential for failures that may be manifested only during an emergency start. To better understand the list, the staff also requests a comparison of how these component/subcomponents perform in a normal start sequence versus an emergency start sequence.

c. The staff requests that Duke explain how the June 20, 1997, event could be modeled using the Keowee PRA. This explanation should include all of the basic events that would be affected by the event failures and the component/subsystem interactions.

d. Duke stated that testing of the regulator in a manner that detects failure of the base adjust setting is a planned improvement. Has this test been incorporated in the monthly test start procedure? Has the base adjust setting been included in the monthly normal start test procedure?

5. In Open Issue 22, the staff was concerned about potential mechanisms for a single common cause grid degradation failing both Keowee power paths when generating to the grid. In Section 3.1.5.2 of the draft safety evaluation report on the Oconee AC power system, the staff discussed the potential for an electrical fault to simultaneously trip both Keowee units while generating to the grid due to loss of excitation protection. The staff also discussed the possiblity that an operator may cause an unwanted actuation of a 40G relay by misadjusting generator field excitation.

Assuming a Keowee lockout occurred, is the Keowee operator or a roving watch operator (as opposed to the Technical Specialist) expected to be able to diagnose the problem and take proper recovery actions to restart the Keowee units? Are there alarms signaling that the 40G relays or other lockouts have been actuated? Are the recovery procedures readily accessible and easily retrieved?