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

50-269/270/287

November 16, 1998

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

SUBJECT: EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 50.46 - OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 (TAC NOS. MA3857, MA3858, AND MA3859)

Dear Mr. McCollum:

By letter dated October 21, 1998, the Duke Energy Corporation (Duke) requested an exemption from the requirements of Title 10 of the Code of Federal Regulations (10 CFR) Section 50.46 for the Oconee Nuclear Station, Units 1, 2, and 3, for the 24-hour period during the performance of the proposed Keowee Emergency Power and Engineered Safeguards Functional Test that will be performed on Unit 3. The exemption addresses the 10 CFR 50.46(b) requirement regarding the emergency core cooling systems (ECCSs) performance criteria. This exemption request is being processed in conjunction with the evaluation of an unreviewed safety question that Duke submitted by letter dated September 17, 1998, for evaluation of proposed changes to the Oconee Updated Final Safety Analysis Report related to the test.

The planned test will be performed with Unit 3 at cold shutdown and its engineered safeguards loads on the standby bus. The other two Oconee units will be operating and, by design of the on-site emergency power system, should not be affected by the test. However, in the unlikely event that a real loss-of-coolant accident and loss of offsite power (LOCA/LOOP) were to occur on either of the operating units within 10 seconds of the time that the simulated LOCA/LOOP is initiated on Unit 3, the Oconee emergency power system would be in a condition outside its design basis. The licensee has estimated that the probability of this condition is 2 E-9/reactor-year. Duke chose to address this condition by requesting an exemption to 10 CFR 50.46.

Duke plans a modification that would add voltage and frequency protection for the Oconee loads when they are supplied from a Keowee hydro unit. The protection would separate Oconee loads from a Keowee unit if that unit's voltage or frequency becomes greater than 110 percent or less than 90 percent of rated value at any time after loading. The planned design would also delay energizing the Oconee loads on the underground power path until the Keowee unit reaches greater than 90 percent voltage and frequency. The existing design allows early loading of the underground path Keowee unit at approximately 60 percent voltage. During the design phase of this modification, while considering the frequency overshoot that the Keowee units normally experience during an emergency start, questions arose concerning whether the emergency power system should be loaded at 60 percent or 90 percent. The

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purpose of the test, therefore, is to provide data needed by Duke to resolve this question.

Enclosed is the exemption for Oconee Units 1 and 2, from the requirement to maintain an ECCS that is designed to conform to the criteria in 10 CFR 50.46(b) during the 10-second time interval when the test is actually being performed during the 24-hour test period. Because Duke has chosen to address this condition by requesting an exemption to 10 CFR 50.46, this action is needed to allow the tests to be performed.

A copy of the exemption has been forwarded to the Office of the Federal Register for publication.

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: Exemption

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

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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| In the Matter of | ) | |
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| DUKE ENERGY CORPORATION | ) | Docket Nos. 50-269, 50-270, and 50-287 |
| | ) | |
| (Oconee Nuclear Station, Units 1, 2, and 3) | ) | |

EXEMPTION

I.

The Duke Energy Corporation (Duke/the licensee) is the holder of Facility Operating License Nos. DPR-38, DPR-47, and DPR-55, that authorize operation of the Oconee Nuclear Station, Units 1, 2, and 3 (Oconee), respectively. The licenses provide, among other things, that the facilities are subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facilities consist of pressurized water reactors located on Duke's Oconee site in Seneca, Oconee County, South Carolina.

II.

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Section 50.46(a)(1)(i), requires that each pressurized light-water nuclear power reactor must be provided with an emergency core cooling system (ECCS) that is designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in

paragraph 50.46(b). ECCS cooling performance must be calculated in accordance with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents (LOCAs) of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated small and large break LOCAs are calculated that will ensure adequate long-term cooling.

By letter dated September 17, 1998, the licensee described a modification that would add voltage and frequency protection for the Oconee loads when they are supplied from a Keowee hydro unit. The protection would separate Oconee loads from a Keowee unit if that unit's voltage or frequency becomes greater than 110 percent or less than 90 percent of rated value at any time after loading. The planned design would also delay energizing the Oconee loads on the underground power path until the Keowee unit reaches greater than 90 percent voltage and frequency. The existing design allows early loading of the underground path Keowee unit at approximately 60 percent voltage. During the design phase of this modification, while considering the frequency overshoot that the Keowee units normally experience during an emergency start, questions arose concerning whether the emergency power system should be loaded at 60 percent or 90 percent. To provide needed data to resolve this question, the Keowee Emergency Power and Engineered Safeguards Functional (KEP/ESF) Test is planned.

The test is scheduled during the Unit 3 outage, will be performed on the Keowee underground path, and will consist of two parts. One part will load the Keowee unit at its present design of approximately 60 percent rated voltage and frequency. The second part will use the same loads, but the Keowee unit will be loaded at approximately 90 percent rated

voltage and frequency. Test data will be collected throughout the Oconee emergency power system (EPS) during the test. The licensee will then review this data to determine which delayed loading modifications should be implemented.

In the September 17, 1998, letter, Duke explained it has determined that this test involves an unreviewed safety question, which, therefore, requires NRC approval prior to performing the test. This request is being processed separately. The licensee also indicated that in the extremely unlikely (probability, according to the licensee, of 2 E-9) event that a real LOCA with loss of offsite power (LOOP) were to occur on either of the Oconee operating units (Unit 1 or 2) simultaneously when the test is initiated on Unit 3, the Oconee EPS would be placed in a condition outside the design basis. The EPS may not be capable of handling the electrical loading of two instantaneous LOCA/LOOP events without some safety related equipment being adversely affected. However, the EPS would be able to handle the electrical loading if the two events are offset in time by approximately 10 seconds to allow the first unit's load to reach a steady-state condition prior to starting of the second unit's emergency loads. Therefore, this 10-second window of vulnerability causes an infinitesimally small, but non-zero, increase in the probability of a malfunction of equipment important to safety and increases the potential consequences of a LOCA/LOOP event during the performance of the test.

The ECCS is designed to assure that the consequences of the spectrum of LOCA accidents, coincident with a LOOP, are within the performance criteria specified in 10 CFR 50.46(b). As explained in the licensee's letter dated October 21, 1998, the planned test on Unit 3 could challenge this criteria in the extremely unlikely event that a LOCA and LOOP on Units 1 or 2 occurred coincident with the start of the test on Unit 3. Therefore, in the

October 21 letter and pursuant to 10 CFR 50.12, the licensee applied for an exemption from 10 CFR 50.46.

III.

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50, when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(iv) in that the exemption would result in benefit to the public health and safety that compensates for the small decrease in safety that may result from granting the exemption. The benefit is that this test will produce data to support a decision on implementation of proposed modifications to the loading methodology of the Keowee hydro unit to improve the overall reliability of the Oconee EPS, which supports the ECCS. The test is being conducted under a comprehensive test plan that includes special management oversight, "just in time training" for the operators, including power system failures, and detailed contingency plans. Other precautions to protect the power systems will be in place, which are described in more detail in the licensee's September 17, 1998, submittal. No other work will be allowed on the EPS of any unit during this test. A Lee gas turbine will be powering CT-5 to provide additional defense in depth for the EPS during the test. This minimizes the likelihood of a plant-centered LOOP occurring during the test period. Additionally, precautions have been taken so that the planned LOOP tests on Unit 3 will not propagate to the operating units.

Therefore, the likelihood of two LOCA/LOOP events occurring within approximately 10 seconds of each other (one event being the LOCA/LOOP test on Unit 3 and the second event being an actual LOCA/LOOP on Unit 1 or 2) is low during the postulated period of 24-hour duration of the KEP/ESF Test.

IV.

For the foregoing reasons, the NRC staff has concluded that the licensee's proposed exemption request from the requirements of 10 CPR 50.46(b) for the KEP/ESF Test is justified. The probability of a coincident LOCA/LOOP on one of the operating units (approximately 2E-9, as estimated by the licensee) was calculated for the entire duration (24 hours) of the KEP/ESF Test. If a separation in time of greater than 10 seconds exists between initiation of the test and a coincident event, the ECCS on the affected unit will be capable of performing its intended safety function. The benefit to the Oconee Emergency Power System from performing this test, along with the low probability of a concurrent LOCA/LOOP on one of the two operating Oconee units, provides justification for granting this exemption request. In addition, granting of the exemption to allow performance of the test will not present an undue risk to public health and safety and is consistent with the common defense and security. The NRC staff has determined that there are special circumstances present, as specified in 10 CFR 50.12(a)(2)(iv), in that the exemption will result in a benefit to the public health and safety that compensates for the decrease in safety that may result from the granting the exemption because the exemption will allow the test to be performed that will produce data to support an implementation decision for a proposed modification that will improve the overall reliability of the Oconee emergency power system.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not endanger life or property or common defense and security, and is, otherwise, in the public interest. Therefore, the Commission hereby grants Duke an exemption from the requirements of 10 CFR 50.46(b) for Units 1, 2, and 3 during the 24-hour period when the tests are being conducted on Unit 3 as requested in the submittal.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant effect on the quality of the human environment ( 63 FR 63754 ).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

ORIGINAL SIGNED BY:

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 16th day of November 1998

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