July 29, 1997

Mr. M. S. Tuckman
Senior Vice President
Nuclear Generation
Duke Power Company
P. O. Box 1006
Charlotte, NC 28201

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SUBJECT: ISSUANCE OF EXEMPTION TO 10 CFR 70.24, CRITICALITY ACCIDENT REQUIREMENTS - OCONEE NUCLEAR STATION UNITS 1, 2, AND 3 (TACS M97865, M97866, AND M97867)

Dear Mr. Tuckman:

The Commission has issued the enclosed exemption from certain requirements of 10 CFR 70.24 regarding criticality accident requirements. This exemption is related to your application dated February 4, 1997, which was supplemented by letter dated March 19, 1997. This exemption relieves Oconee Nuclear Station Units 1, 2, and 3 from the requirements of 10 CFR 70.24(a)(1) and (2) regarding the detection, sensitivity, and coverage capabilities of criticality monitors, and from (a)(3) regarding emergency procedures for each area in which licensed special nuclear material is handled, used, or stored. The Safety Evaluation supporting the exemption provides details of the technical basis.

A copy of the Exemption and the supporting Safety Evaluation by the staff is enclosed. The Exemption is being 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

Enclosures: 1. Exemption
2. Safety Evaluation

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

July 29, 1997

Mr. M. S. Tuckman
Senior Vice President
Nuclear Generation
Duke Power Company
P. O. Box 1006
Charlotte, NC 28201

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

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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

EXEMPTION

I.

Duke Power Company (the licensee) is the holder of Facility Operating License Nos. DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The licenses provide, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

These facilities consist of three pressurized water reactors located at the licensee's site in Oconee County, South Carolina.

II.

Title 10 of the Code of Federal Regulations (10 CFR) at subsection (a) of 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material shall maintain in each area where such material is handled, used, or stored, a criticality accident monitoring system "using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify the detection, sensitivity, and coverage capabilities of the monitors required by 10 CFR 70.24(a). Subsection (a)(3) of 10 CFR 70.24 requires that the licensee shall

maintain emergency procedures for each area in which this licensed special nuclear material is handled, used, or stored and provides (1) that the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality monitor alarm, (2) that the procedures must include drills to familiarize personnel with the evacuation plan, and (3) that the procedures designate responsible individuals for determining the cause of the alarm and placement of radiation survey instruments in accessible locations for use in such an emergency. Subsection (b)(1) requires licensees to have a means to quickly identify personnel who have received a dose of 10 rads or more. Subsection (b)(2) requires licensees to maintain personnel decontamination facilities, to maintain arrangements for a physician and other medical personnel qualified to handle radiation emergencies, and to maintain arrangements for the transportation of contaminated individuals to treatment facilities outside the site boundary. Subsection (c) exempts Part 50 licensees (such as Oconee) from the requirements of paragraph (b). Subsection (d) states that any licensee who believes that there is good cause why he should be granted an exemption from all or part of 10 CFR 70.24 may apply to the Commission for such an exemption and shall specify the reasons for the relief requested.

By letter dated February 4, 1997, as supplemented March 19, 1997, the licensee requested an exemption for all the Duke Power Company nuclear plants from the requirements of 10 CFR 70.24. The staff has reviewed the licensee's submittal, and documented its detailed review in a Safety Evaluation. The staff found that existing procedures and training, as well as design features and radiation monitoring instrumentation required by the Technical Specifications make an inadvertent criticality in special nuclear materials

handling or storage at Oconee unlikely. The licensee has thus met the intent of 10 CFR 70.24(d) by the low probability of an inadvertent criticality in areas where fresh fuel could be present, by the licensee's adherence to General Design Criterion 63 regarding radiation monitoring, by maintenance of appropriate procedures, and by provisions for personnel training and evacuation.

III.

Section 70.14 of 10 CFR, "Specific exemptions," states that

> The Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

Section 70.24(d) of 10 CFR states that

> Any licensee who believes that good cause exists why he should be granted an exemption in whole or in part from the requirements of this section may apply to the Commission for such exemption.

Accordingly, the Commission has determined that good cause is present as defined in 10 CFR 70.24(d). The Commission has further determined that, pursuant to 10 CFR 70.14, the exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. The Commission hereby grants the licensee an exemption from the requirements of 10 CFR 70.24(a)(1), (2), and (3), on the bases as stated in Section II above.

Pursuant to 10 CFR 51.32, the Commission has determined that granting of this exemption will have no significant effect on the quality of the human environment (62 FR 40122).

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 29thday of July 1997.

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Oconee Nuclear Station
Units 1, 2, and 3

cc:
Mr. Paul R. Newton
Duke Power Company, PB05E
422 South Church Street
Charlotte, North Carolina 28242-0001

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

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

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Route 2, Box 610
Seneca, South Carolina 29678

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. Ed Burchfield
Compliance
Duke Power Company
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

Mr. G. A. Copp
Licensing - EC050
Duke Power Company
526 South Church Street
Charlotte, North Carolina 28242-0001

Dayne H. Brown, Director
Division of Radiation Protection
North Carolina Department of
Environment, Health and
Natural Resources
P. O. Box 27687
Raleigh, North Carolina 27611-7687

Mr. J. W. Hampton
Vice President, Oconee Site
Duke Power Company
P. O. Box 1439
Seneca, South Carolina 27679

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 29th day of July 1997.

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

SAFETY EVALUATION OF THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO REQUEST FOR EXEMPTION FROM 10 CFR 70.24 REQUIREMENTS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

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

1.0 BACKGROUND

Title 10 of the Code of Federal Regulations (10 CFR) at subsection (a) of 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material shall maintain in each area where such material is handled, used, or stored, a criticality accident monitoring system "using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify the detection, sensitivity, and coverage capabilities of the monitors required by 10 CFR 70.24(a). Subsection (a)(3) of 10 CFR 70.24 requires that the licensee shall maintain emergency procedures for each area in which this licensed special nuclear material is handled, used, or stored and provides (1) that the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality monitor alarm, (2) that the procedures must include drills to familiarize personnel with the evacuation plan, and (3) that the procedures designate responsible individuals for determining the cause of the alarm and placement of radiation survey instruments in accessible locations for use in such an emergency.

Subsection (b)(1) of 10 CFR 70.24 requires licensees to have a means to quickly identify personnel who have received a dose of 10 rads or more. Subsection (b)(2) of 10 CFR 70.24 requires licensees to maintain personnel decontamination facilities, to maintain arrangements for a physician and other medical personnel qualified to handle radiation emergencies, and to maintain arrangements for the transportation of contaminated individuals to treatment facilities outside the site boundary. Paragraph (c) of 10 CFR 70.24 exempts Part 50 licensees from the requirements of paragraph (b) of 10 CFR 70.24 for special nuclear material used or to be used in the reactor. Subsection (d) of 10 CFR 70.24 states that any licensee who believes that there is good cause why he should be granted an exemption from all or part of 10 CFR 70.24 may apply to the Commission for such an exemption and shall specify the reasons for the relief requested.

Enclosure

By letter dated February 4, 1997, as supplemented March 19, 1997, Duke Power Company (the licensee) requested an exemption from the requirements of 10 CFR 70.24. The staff has reviewed the submittals and determined that procedures and design features make an inadvertent criticality in special nuclear materials handling or storage at Oconee unlikely, in accordance with General Design Criterion 62, as described below.

2.0 EVALUATION

Oconee has no new fuel storage vault. Special nuclear material, as nuclear fuel, is stored in the spent fuel pool and the new fuel receiving bay. The spent fuel pool is used to store under water both irradiated fuel after its discharge from the reactor, and new fuel prior to loading into the reactor. The new fuel receiving bay, where fuel is stored temporarily, has no piping that could rupture and flood the area, there is a drainage system, and there is no hydrogenous fire fighting equipment in the area.

Special nuclear material is also present in the form of fissile material incorporated into nuclear instrumentation. The small quantity of special nuclear material present in these items precludes an inadvertent criticality.

2.1 Requirements of 10 CFR 70.24(a)(1) and (2)

Consistent with Technical Specification (TS) Section 5.4.1, the spent fuel pool is designed to store the fuel in a geometric array that precludes criticality. The spent fuel racks are designed such that the effective neutron multiplication factor, k_{eff}, will remain less than or equal to 0.95 under all normal and accident conditions for fuel of maximum nominal enrichment of 5.0 weight percent (wt%) U-235. The staff has found this design adequate.

Nuclear fuel is moved between the shipping container (two assemblies in each container) and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions where criticality would be a concern. Only one new fuel assembly is handled at any one time in any area of the fuel building. Upon removal from the shipping container, the assembly is inspected and transferred by the crane to the spent fuel pool for storage. All valves that could allow water into the area of the spent fuel operating deck are administratively controlled, and remain shut during fuel handling operations.

Procedures and controls prevent an inadvertent criticality during fuel handling; nevertheless, radiation monitoring, as required by General Design Criterion 63, is provided for handling new fuel prior to being placed into the spent fuel pool. In addition, handling of fuel in the spent fuel pool is controlled by procedures and is monitored by TS-required area radiation monitors and portable monitors on the fuel handling bridges. These required radiation monitors have alarm response procedures that provide instructions to the operators upon receipt of alarms. The radiation monitoring system is designed to indicate existing radiation levels and to alarm when radiation levels exceed setpoints to assure that radiation exposure of personnel does not exceed 10 CFR 20 limits.

The licensee provides radiation alarm training in the general employee plant access training that each employee receives prior to being badged for unescorted access at the plant. This training identifies the types of alarms that are used, the types of alarm signals emitted, and the expected employee response.

2.2 Requirements of 10 CFR 70.24(a)(3)

The purpose of 10 CFR 70.24 is to ensure that if a criticality were to occur during the handling of special nuclear material, personnel would be alerted to that fact and would take appropriate action. Although the staff has determined that reasonable and satisfactory precautions exist to preclude a nuclear criticality accident, thereby meeting the requirements of General Design Criterion 62, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. Should a criticality occur, these monitors will detect the increased radiation levels inherent to such a condition, and alert personnel to the excessive radiation levels, which will allow them to initiate appropriate safety actions. The low probability of an inadvertent criticality, together with the licensee's adherence to General Design Criterion 63, radiation worker training, and procedures, constitute good cause for granting an exemption to the requirements of 10 CFR 70.24. Therefore, the staff has determined that the licensee's procedures and training meet the intent of 10 CFR 70.24(a)(3) and adherence to the specific requirements of this section is not necessary to serve the underlying purpose of the rule.

2.3 Requirements of 10 CFR 70.24(b) and (c)

The requirements of 10 CFR 70.24(c) exempt holders of Part 50 operating licenses (e.g., Oconee) from the requirements of 10 CFR 70.24(b)(1) and (2) regarding decontamination facilities, arrangements for physician and other medical personnel qualified to handle radiation emergencies, and arrangements for the transportation of contaminated individuals to treatment facilities outside the site boundary. Thus there is no need for the staff to take any action on 10 CFR 70.24(b) and (c) for Catawba.

3.0 CONCLUSION

In accordance with 10 CFR 70.24(d), the licensee has demonstrated that good cause exists for an exemption: the existing facility design, operating procedures, training, and Technical Specification storage and radiation monitor requirements, ensure extremely low probability of criticality, and the existing emergency procedure provides for notification and evacuation of personnel. Since literal compliance with the requirements of 10 CFR 70.24(a)(1), (2), and (3) would not increase the margin of safety, an exemption can be granted.

Principal Contributor: Laurence Kopp

Date: July 29, 1997