

Docket Nos. 50-269/273/287

June 3, 1976

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

Gentlemen:

The Commission has issued the enclosed Amendment No. 24 to License No. DPR-38; Amendment No. 24 to License No. DPR-47; and Amendment No. 21 to License No. DPR-55 for the Oconee Nuclear Station, Units 1, 2, and 3. The amendments are in response to your application dated April 16, 1976.

The amendments would allow the dry storage of new fuel assemblies in fuel storage racks located in Unit 3 spent fuel pool.

Copies of the Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original Signed by

Robert A. Purple, Chief
 Operating Reactors Branch #1
 Division of Operating Reactors

Enclosures:

1. Amendment No. 24 to DPR-38
2. Amendment No. 24 to DPR-47
3. Amendment No. 21 to DPR-55
4. Safety Evaluation
5. Federal Register Notice

cc w/enclosures:
 See next page

OFFICE →	ORB#1	OELD	ORB#1	PSB	EB
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Duke Power Company

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June 3, 1976

cc w/enclosures:

Mr. William L. Porter
Duke Power Company
P. O. Box 2173
422 South Church Street
Charlotte, North Carolina 28242

Mr. Troy B. Conner
Conner & Knotts
1747 Pennsylvania Avenue, NW
Washington, D. C. 20006

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

Honorable Reese A. Hubbard
County Supervisor of Oconee County
Walhalla, South Carolina 29621

cc w/enclosures and incoming:

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



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20545

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DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 24
License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Duke Power Company (the licensee) dated April 16, 1976, complies 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 application, 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. After weighing the environmental aspects involved, 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 a change to the Technical Specifications as indicated in the attachment to this license amendment.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Date of Issuance: June 3, 1976

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 24 TO FACILITY LICENSE NO. DPR-38

AMENDMENT NO. 24 TO FACILITY LICENSE NO. DPR-47

AMENDMENT NO. 21 TO FACILITY LICENSE NO. DPR-55

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

Revise Appendix A as follows:

Remove pages 4.1-10, 5.4-1 and 5.4-1a, and insert revised identically numbered pages.

TABLE 4.1-3

MINIMUM SAMPLING FREQUENCY

<u>Item</u>	<u>Check</u>	<u>Frequency</u>
1. Reactor Coolant	a. Gamma Isotopic Analysis	a. Monthly*
	b. Radiochemical Analysis for Sr 89, 90	b. Monthly*
	c. Tritium	c. Monthly*
	d. Gross Beta & Gamma Activity (1)	d. 5 times/week*
	e. Chemistry (Cl, F and O2)	e. 5 times/week*
	f. Boron Concentration	f. 2 times/week**
	g. Gross Alpha Activity	g. Monthly*
	h. \bar{E} Determination (2)	h. Semi-annually
2. Borated Water Storage Tank Water Sample	Boron Concentration	Weekly* and after each makeup
3. Core Flooding Tank	Boron Concentration	Monthly* and after each makeup
4. Spent Fuel Pool Water Sample	Boron Concentration	Monthly*** and after each makeup
5. Secondary Coolant	a. Gross Beta & Gamma Activity	a. Weekly*
	b. Iodine Analysis (3)	
6. Concentrated Boric Acid Tank	Boron Concentration	Twice weekly*

*Not applicable if reactor is in a cold shutdown condition for a period exceeding the sampling frequency.

**Applicable only when fuel is in the reactor.

***Applicable only when fuel is in wet storage in the spent fuel pool.

5.4 NEW AND SPENT FUEL STORAGE FACILITIES

Specification

5.4.1 New Fuel Storage

- 5.4.1.1 New fuel will normally be stored in the spent fuel pool serving the respective unit.

In the spent fuel pool serving Units 1 and 2, the fuel assemblies are stored in racks in parallel rows, having a nominal center-to-center distance of 21 inches in both directions. This spacing is sufficient to maintain a K effective of less than 0.9 when flooded with unborated water, based on fuel with an enrichment of 3.5 weight percent U²³⁵.

In the spent fuel pool serving Unit 3, the fuel assemblies are stored in racks consisting of stainless steel cavities which maintain a minimum edge-to-edge spacing of 3.95 inches between adjacent fuel assemblies. The neutron poisoning effect of the storage cavity material combined with the minimum 3.95 inches edge-to-edge spacing between adjacent fuel assemblies is sufficient to maintain a K effective of less than 0.95 when flooded with unborated water, based on fuel with an enrichment of 3.5 weight percent U²³⁵ or the equivalent.

- 5.4.1.2 New fuel may also be stored in the fuel transfer canal. The fuel assemblies are stored in five racks in a row having a nominal center-to-center distance of 2' 1-3/4". One rack is oversized to receive a failed fuel assembly container. The other four racks are normal size and are capable of receiving new fuel assemblies.

- 5.4.1.3 New fuel may also be stored in shipping containers.

- 5.4.1.4 New fuel of enrichment not exceeding 2.9 weight percent U-235 or the equivalent may be placed in dry storage in Unit 3 fuel storage racks in a checkerboard pattern, with fuel assemblies occupying only diagonally adjacent storage locations. Unused storage locations in a fuel storage module shall be covered by inserting a metal plate in the lead-in to prevent incorrect placement of fuel assemblies. This configuration is sufficient to ensure a K effective of less than 0.9 at all times.

5.4.2 Spent Fuel Storage

- 5.4.2.1 Irradiated fuel assemblies will be stored, prior to offsite shipment, in a stainless steel lined spent fuel pool.

The spent fuel pool serving Units 1 and 2 is sized to accommodate a full core of irradiated fuel assemblies in addition to the concurrent storage of the largest quantity of new and spent fuel assemblies predicted by the fuel management program.

Provisions are made in the Unit 3 spent fuel pool to accommodate up to 474 fuel assemblies.

- 5.4.2.2 Spent fuel may also be stored in storage racks in the fuel transfer canal when the canal is at refueling level.
- 5.4.3 Except as provided in Specification 5.4.1.4, whenever there is fuel in the pool, the spent fuel pool is filled with water borated to the concentration that is used in the reactor cavity and fuel transfer canal during refueling operations.
- 5.4.4 The spent fuel pool and fuel transfer canal racks are designed for an earthquake force of 0.1g ground motion.

REFERENCES

FSAR, Section 9.7



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20545

DUKE POWER COMPANY

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 24
License No. DPR- 47

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Duke Power Company (the licensee) dated April 16, 1976, complies 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 application, 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. After weighing the environmental aspects involved, 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 a change to the Technical Specifications as indicated in the attachment to this license amendment.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Date of Issuance: June 3, 1976



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20545

DUKE POWER COMPANY

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 21
License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Duke Power Company (the licensee) dated April 16, 1976, complies 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 application, 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. After weighing the environmental aspects involved, 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 a change to the Technical Specifications as indicated in the attachment to this license amendment.

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

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Date of Issuance: June 3, 1976



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 24 TO FACILITY LICENSE NO. DPR-38

SUPPORTING AMENDMENT NO. 24 TO FACILITY LICENSE NO. DPR-47

SUPPORTING AMENDMENT NO. 21 TO FACILITY LICENSE NO. DPR-55

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

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

Introduction

By letter dated April 16, 1976, Duke Power Company (the licensee) requested a change in the Technical Specifications of Licenses No. DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station, Units No. 1, No. 2 and No. 3. The proposed amendments would allow the dry storage of new, unirradiated fuel assemblies in fuel storage racks located in the Unit No. 3 spent fuel pool.

Discussion

The Unit No. 3 spent fuel pool is presently dry and undergoing modifications as authorized by license amendments issued on December 22, 1975. Four of the ten new-design fuel storage modules, each of which can accommodate 48 fuel assemblies, have been completed and are installed in the Unit No. 3 pool and are capable of storing new fuel assemblies. Completion of the remaining work in the pool is not anticipated until July 1976, at the earliest. The common pool for Units No. 1 and No. 2 presently contains two batches of spent fuel assemblies and one batch of new assemblies. Due to this inventory, a full core discharge from either Unit No. 1 or Unit No. 2 could not be accommodated. In order to provide for this capability and to allow the completion of the Unit No. 3 pool modifications, Duke Power Company is proposing that the new fuel assemblies, of enrichment up to 2.9 weight percent U-235, be relocated and stored dry in the new fuel storage modules in the Unit No. 3 pool.

Evaluation

In our Safety Evaluation accompanying the December 22, 1975 license amendments for modification of the Oconee Unit No. 3 spent fuel pool, we addressed each area in which potential safety considerations were involved. In the licensee's present proposal, concepts which were not previously reviewed are (1) the dry storage of new fuel in diagonally adjacent storage locations, and (2) the storage of new fuel in the Unit No. 3 pool prior to completing the installation of all ten fuel storage modules. Our review has therefore involved these areas in terms of criticality considerations, structural and mechanical integrity and accident analysis. Each of these areas is discussed below.

Criticality Analysis

In our initial review of the new storage racks we considered all ten modules to be completely filled with new fuel and the spent fuel pool flooded with non-borated water. We agreed with the licensee that with a minimum center-to-center spacing of 14.090 inches, the effective neutron multiplication factor, K effective, of the array would be 0.936, including all uncertainties. This is less than the 0.95 K effective considered as the maximum acceptable. In the licensee's proposal, new fuel would be stored in a checker board pattern in which fuel assemblies would only occupy diagonally adjacent storage locations. In such a configuration, the most limiting condition is one in which the pool is flooded and the water is removed from the intercell space without removing it from the fuel assembly itself. When the fuel assembly is full of water, it is slightly undermoderated so that taking water out of the fuel assembly would reduce the neutron multiplication. As a consequence, the situation that would cause the greatest neutron multiplication is one in which the fuel assemblies are filled with water, but there is no water or only a small amount of water in the intercell space between the fuel assemblies.

Although the probability is low that the situation described above could develop, the licensee has assumed that a large volume of water from fire fighting apparatus, a pipe break or some other source strikes the funnel at the top of each storage location in such a manner that most of the water is directed to the interior of the storage box and into a fuel assembly. For this situation, the licensee has postulated that the interior of the storage box becomes completely filled with water, with a density of approximately 1 gm/cm^3 , while the density of the water in the intercell regions is only $.02 \text{ gm/cm}^3$. The calculated neutron multiplication factor for this situation is .84, with the fuel assemblies stored in a checker board pattern. Since this accident would result in the highest credible neutron multiplication factor, we find the criticality analysis of the proposal to be acceptable.

Structural and Mechanical Analysis

In considering the structural and mechanical aspects of the licensee's proposal, we reviewed the supportive information provided with the application for modification of the Unit No. 3 spent fuel pool. We have concluded that with four of the ten fuel storage modules installed, the seismic design analysis previously considered remains valid and that no structural or mechanical problems will exist with the dry storage of new fuel.

Accident Analysis Considerations

Since the proposal would allow the dry storage of only new, unirradiated fuel in the Unit No. 3 spent fuel pool, radiological consequences of various postulated accidents involving mechanical damage to a fuel assembly are not applicable. We have, however, considered the possibility of fuel assemblies being placed in a configuration other than the checker board pattern for which the maximum possible neutron multiplication factor was analyzed. To preclude such an occurrence, the Technical Specifications shall include the requirement that unused storage locations in a fuel storage module shall be covered by inserting a metal plate in the lead-in to prevent incorrect placement of fuel assemblies.

We have also reviewed the licensee's original quality assurance commitment during construction and installation of the new storage racks as stated in the Duke Company Topical Report, DUKE-1, and have concluded that adequate measures exist to preclude the possibility of damage to stored fuel during the installation of the remaining fuel storage racks.

In summary, we have reviewed the original application for modification of the Unit No. 3 spent fuel pool and have analyzed those areas in which previously unreviewed safety questions were found to exist. We have determined that if fuel assemblies which have no more than 39 grams of U-235 per axial centimeter of assembly (i.e., no more than 2.9 weight percent U-235 enrichment) are loaded into a checkerboard pattern in the Oconee Unit 3 pool dry storage racks, the calculated neutron multiplication for the worst conceivable accident would be well within the limit of .95 considered by the staff to be acceptable. Based on the results of our review we have therefore determined that the dry storage of new fuel in the Unit No. 3 spent fuel pool is acceptable.

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 statement, negative declaration, or 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 change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the change does 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.

Date: June 3, 1976

UNITED STATES NUCLEAR REGULATORY COMMISSION

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

DUKE POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY
OPERATING LICENSES

Notice is hereby given that the U.S. Nuclear Regulatory Commission (the Commission) has issued Amendments No. 24, 24, and 21 to Facility Operating Licenses No. DPR-38, DPR-47, and DPR-55, respectively, issued to Duke Power Company which revised the licenses for operation of the Oconee Nuclear Station, Units No. 1, No. 2, and No. 3, located in Oconee County, South Carolina. The amendments are effective as of the date of issuance.

The amendments would allow the dry storage of new fuel assemblies in fuel storage racks located in Unit No. 3 spent fuel pool.

The application for the amendments complies 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 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 § 91.5(d)(4) an environmental statement, negative declaration or

environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the application for amendment dated April 16, 1976, (2) Amendments No. 24, 24, and 21 to License Nos. DPR-28, 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, NW., Washington, D.C. and at the Oconee County Library, 201 South Spring Street, Walhalla, South Carolina 29691.

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 3rd day of June, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Operating Reactors