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Dockets Nos. 50-269/270/287

September 10, 1976

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. 32 to License No. DPR-38; Amendment No. 32 to License No. DPR-47 and Amendment No. 29 to License No. DPR-55 for the Oconee Nuclear Station, Units Nos. 1, 2 and 3. The amendments consist of changes to the Technical Specifications and are in response to your application dated August 20, 1976.

The amendments require that spent fuel assemblies stored in designated areas of the Oconee spent fuel pools be decayed a minimum of 43 days prior to spent fuel cask movement.

Copies of the Safety Evaluation, Environmental Impact Appraisal and the Federal Register Notice are also enclosed.

Sincerely,

Original signed by

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment No. 32 to DPR-38
2. Amendment No. 32 to DPR-47
3. Amendment No. 29 to DPR-55
4. Safety Evaluation and Environmental Impact Appraisal
5. Federal Register Notice

cc w/enclosures:
See next page

APCSB
V. Benaroya
9/9/76

OFFICE	ORB#1	OELD	ORB#1	EEB	LEB	AD/OT
SURNAME	GZech:tsb	W D Paton	ASchwencer	D. Grimes	L. Shao	D. Eisenhut
DATE	9/8/76	9/10/76	9/10/76	9/8/76	9/9/76	9/10/76

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cc: Mr. William L. Porter
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Charlotte, North Carolina 28242

Mr. Troy B. Conner
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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

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. 32
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 August 20, 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. 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.

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

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 10, 1976

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 32 TO FACILITY LICENSE NO. DPR-38

AMENDMENT NO. 32 TO FACILITY LICENSE NO. DPR-47

AMENDMENT NO. 29 TO FACILITY LICENSE NO. DPR-55

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

Revise Appendix A as follows:

Remove page 5.4-1a and insert 5.4-1a revised page.

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.

5.4.5 Prior to spent fuel cask movement, spent fuel stored in the first 13 rows of the Unit 1 and 2 spent fuel pool and in the first 20 rows of the Unit 3 spent fuel pool, closest to the spent fuel cask handling area, shall be decayed a minimum of 43 days.

REFERENCES

FSAR, Section 9.7

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

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 32
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 August 20, 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. 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.

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

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 10, 1976

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

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 29
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 August 20, 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. 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.

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

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 10, 1976

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

SAFETY EVALUATION AND ENVIRONMENTAL IMPACT APPRAISAL BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 32 TO FACILITY LICENSE NO. DPR-38

AMENDMENT NO. 32 TO FACILITY LICENSE NO. DPR-47

AMENDMENT NO. 29 TO FACILITY 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

Introduction

By letter dated August 20, 1976, Duke Power Company (the licensee) requested a change to the Technical Specifications appended to Licenses Nos. DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station Units Nos. 1, 2 and 3. The amendments would require that spent fuel assemblies stored in designated areas of the two Oconee spent fuel pools be decayed a minimum of 43 days prior to spent fuel cask movement.

Discussion

By letter dated July 22, 1974, we requested that the licensee furnish, as an amendment to the Oconee FSAR, additional information on the Oconee facility design and operating procedures related to spent fuel handling that demonstrates that the objective of Section 50.34(b)(4) of 10 CFR 50 is met, or will be met by appropriate plant modifications. Section 50.34 (b)(4) requires that analysis and evaluation of the design and performance of structures, systems and components of the facility with the objective of assessing the risk to public health and safety, in particular, including determination of the adequacy of structures, systems and components provided for the prevention of accidents and mitigation of the consequences of accidents, be included in the FSAR.

Revision 35 to the Oconee FSAR, issued by the licensee on September 30, 1974, included a description of the equipment used to handle spent fuel casks at the Oconee Nuclear Station. By letter dated August 29, 1975, we advised the licensee that revision 35 did not contain sufficient analysis to support its conclusions on spent fuel cask handling system acceptability. We therefore requested that the licensee provide additional information. By letters dated November 3, 1975, March 19, 1976 and July 26, 1976, the licensee provided the additional information we requested.

The licensee was requested to specifically address the possibility of a spent fuel cask dropping onto spent fuel stored in the pool and the resultant radiological consequences. In addition, the licensee's submittal was to include the effects on the spent fuel pool liner should the spent fuel cask strike it during the postulated accident.

The licensee has conservatively estimated that up to 76 fuel assemblies could be damaged should a failure of the spent fuel cask handling crane or other cask handling equipment occur. In order to maintain the resultant whole body and thyroid doses well within the exposure guidelines of 10 CFR Part 100 it was determined that all fuel assemblies in the spent fuel pool areas which would be vulnerable to impact from a postulated spent fuel handling cask accident should have previously been decayed for a minimum of 43 days. The licensee has therefore proposed that, prior to spent fuel cask movement, spent fuel stored in the first 13 rows of the Unit Nos. 1 and 2 common spent fuel pool and in the first 20 rows of the Unit No. 3 spent fuel pool closest to the spent fuel cask handling area in each pool, shall be decayed a minimum of 43 days following its last activation in the reactor from which it was removed.

Evaluation

Our review of the Oconee spent fuel handling system involved an evaluation of the consequences of a spent fuel cask tipping and falling onto spent fuel assemblies in the spent fuel pool. The review included consideration of both the safety and environmental aspects of such a postulated accident.

Safety Considerations

As indicated by the licensee, the path of travel of the spent fuel cask handling crane does not allow the spent fuel cask to pass over stored fuel in either the pool common to Units Nos. 1 and 2 or in the Unit No. 3 pool. However, assuming a failure of the crane or handling equipment, and that the falling cask strikes the rim of the spent fuel pool or cask platform in the pool, it can be postulated that the cask would be deflected onto the stored fuel closest to the cask handling area. The licensee has considered the worst situation to be a hoist cable failure when the cask is positioned over the fuel pool wall with a resultant eccentric drop of the cask onto the wall. In such a case, the cask, as well as the yoke and load block of the cask handling system could be deflected onto spent fuel. The licensee provided an analysis of the failure postulated above to determine the number of fuel assemblies which could be contacted. The Oconee Unit No. 3 spent fuel pool was selected for the analysis since it will have a higher fuel storage density as a result of the license amendment issued by us on December 22, 1975, which authorized an increase in the fuel assembly storage capacity from 216 to 474 assemblies. The licensee described the assumptions employed and conservatisms considered in its analysis and concluded that a maximum of 76 fuel assemblies could be affected in the postulated accident.

Regarding the assumptions used by the licensee to determine the resultant radiation exposure doses from the postulated accident, we indicated to the licensee that a fuel radial peaking factor of 1.65 and a X/Q, value of $2.2X10^{-4}$ sec/m^3 (5% meterology at 1609 meters) would provide more conservative estimates. Using these values, exposure doses of less than 1 Rem Whole Body and 150 Rem Thyroid would be predicted if the 76 fuel assemblies assumed to be damaged have first been allowed to decay a minimum of 43 days following reactor shutdown. These conservative assumptions and others we employed in our independent analysis of the spent fuel cask tip accident and the resultant estimated doses are summarized in Table 1.

In view of the above, the licensee has agreed to place technical specification restrictions on the storage of fuel assemblies in both Oconee spent fuel pools to assure that spent fuel which might be contacted in a postulated dropped fuel cask accident has decayed for at least 43 days following its last activation in the reactor from which it was removed.

The licensee also provided an analysis of the effects on the spent fuel pool liner should the cask strike it during this postulated accident. It was indicated that the spent fuel pool concrete was originally designed for the cask drop accident. Should the cask strike the bottom liner plate on the edge, however, localized concrete crushing of the fill concrete would occur and the liner plate would be ruptured in the area of impact. The licensee therefore analyzed this possibility to determine the rate that pool water would escape. The results of this analysis show that the calculated leakage would be 21.3 gallons per day and would be well within the capacity of the pool water makeup systems. We have reviewed the licensees analysis and have concluded that the conditions assumed were appropriately conservative and agree that more than adequate makeup water would be available should damage to the spent fuel pool liner occur.

In summary, it is considered that the postulated dropped fuel cask accident evaluated herein is extremely remote. Given a dropped fuel cask, it is highly unlikely that damage would occur to a significant number of stored spent fuel assemblies in either of the two Oconee spent fuel pools due to the fact that the crane travel does not pass over stored fuel assemblies. Nevertheless, we have determined that the analysis of the postulated dropped fuel cask accident submitted by the licensee uses conservative assumptions to obtain the maximum number of fuel assemblies affected. We have concluded that the assumptions and analytical techniques utilized are acceptable and that the licensee has adequately predicted the maximum number of fuel assemblies affected.

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.

Environmental Impact Appraisal

If, in a postulated fuel cask accident, the cask and associated handling device are assumed to tip and fall into the spent fuel pool and damage 76 fuel assemblies, the resulting thyroid and whole body doses would be well within the exposure guidelines of 10 CFR Part 100 for 5 per cent meteorology as discussed above, and would be <1 Rem to the thyroid for 50 per cent meteorology. This is not significantly greater than the expected consequences of other accidents previously evaluated in the Oconee Final Environmental Statement (FES). Radioactive effluent releases from postulated fuel handling accidents remain unchanged from those presented in the FES of March 1972. The realistic assumptions and estimated consequences for the spent fuel cask tip are summarized in Table 2.

In our Safety Evaluation supporting the license amendment issued on December 22, 1975, we indicated that the transfer of spent fuel from the Units Nos. 1 and 2 spent fuel pool to the Unit No. 3 spent fuel pool would possibly start in about 4 years. The licensee has indicated to us that such transfers may actually commence in September 1976 following completion of the design modifications to the Unit No. 3 pool. As concluded in our Environmental Impact Appraisal supporting the December 22, 1975 license amendment, a maximum of about 150 spent fuel assemblies are expected to be transferred from the Units Nos. 1 and 2 pool to the Unit No. 3 pool over the life of the plant. The dose rate for the transfer of 150 assemblies was calculated to be approximately 150 man-rem. This was considered not to involve a significant increase in the expected occupational exposures as previously reviewed. We therefore conclude that the transfer of spent fuel assemblies between the two spent fuel pools earlier than previously expected is acceptable and should be allowed to proceed as is now planned.

With regard to possible contamination due to the maximum expected spent fuel pool leakage of 21.3 gallons per day due to a ruptured liner plate, the licensee provided information indicating that the nearest water source used by the public that would become contaminated is Lake Hartwell (Keowee River). Based on permeability tests conducted at the Oconee facility, it would take a minimum of four years for any leakage to reach the oil collection pond which is ultimately discharged to Lake Hartwell.

This route is the most limiting of those examined. We agree with the licensee that four years would provide more than sufficient time to correct any damage to a spent fuel pool liner plate or to take other measures to prevent contamination of the Lake Hartwell water source.

Conclusion and Basis for Negative Declaration

On the basis of the foregoing analysis, it is concluded that there will be no significant environmental impact attributable to the proposed action. Having made this conclusion, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared and that a negative declaration to this effect is appropriate.

Date: September 10, 1976

TABLE 1

CONSERVATIVE ASSUMPTIONS AND ESTIMATED CONSEQUENCES FOR SPENT FUEL CASK TIP AT OCONEE 3

Power level	2928 Mwt
Operating time	3 years
Power peaking factor	1.65
Decay times	43 days
Fraction in gaps:	
Kr-85	30%
All other noble gases	10%
Iodine	10%
Number of assemblies damaged	76
Number of assemblies in core	177
Iodine Decontamination Factor in pool water	100
Initial inventories at time of shutdown:	
I-131	25,080 ci/Mwt
Xe-131m	259.5 ci/Mwt
Xe-133	56,220 ci/Mwt
Kr-85	410.2 ci/Mwt
Breathing Rate	$3.47 \times 10^{-4} m^3/sec$

	5% X/Q, sec/m^3	Dose, rem (43 days) Thyroid	Dose, rem (43 days) Whole Body
EAB (1609 m)	2.2×10^{-4}	150	<1
LPZ Boundary (9656 m)	4.0×10^{-5}	27	<1

TABLE 2

REALISTIC ASSUMPTIONS AND ESTIMATED CONSEQUENCES FOR SPENT FUEL CASK TIP AT OCONEE 3

Power level	2928 Mwt
Operating time	3 years
Power peaking factor	1.0
Decay times	43 days
Fraction in gaps:	
Kr-85	20%
All other noble gases	2%
Iodine	2%
Number of assemblies damaged	76
Number of assemblies in core	177
Iodine Decontamination Factor in pool water	500
Initial inventories at time of shutdown:	
I-131	25,080 ci/Mwt
Xe-131m	259.5 ci/Mwt
Xe-133	56,220 ci/Mwt
Kr-85	410.2 ci/Mwt
Breathing Rate	3.47×10^{-4} m^3/sec

	50% X/Q, sec/m^3	Dose, rem (43 days) Thyroid	Whole Body
EAB (1690 m)	4.7×10^{-5}	<1	<1
LPZ Boundary (9656 m)	2.5×10^{-6}	<1	<1

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 AND NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 32, 32 and 29 to Facility Operating Licenses Nos. 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 Nos. 1, 2 and 3, located in Oconee County, South Carolina. The amendments are effective as of the date of issuance.

The amendments require that spent fuel assemblies stored in designated areas of the Oconee spent fuel pools be decayed a minimum of 43 days prior to spent fuel cask movement.

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. Prior public notice of the amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has prepared an environmental impact appraisal for the revised Technical Specifications and has concluded that an environmental impact statement for this particular action is not warranted because the

Commission has determined that this is not a major action significantly affecting the quality of the human environment, and that a negative declaration to this effect is appropriate.

For further details with respect to this action, see (1) the application for amendment dated August 20, 1976, (2) Amendments Nos. 32, 32 and 29 to License Nos. DPR-38, DPR-47 and DPR-55, respectively and (3) the Commission's related Safety Evaluation and Environmental Impact Appraisal. 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 10th day of September 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors