DEC 22 1975

Docket Nos. 50-269
~~50-270~~
50-287

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. 17, Technical Specification Change No. 27 for License No. DPR-38; Amendment No. 17, Technical Specification Change No. 22 for License No. DPR-47; and Amendment No. 14, Technical Specification Change No. 14 for License No. DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3. These amendments are in response to your request dated September 12, 1975.

These amendments allow changes in the design of the Unit 3 spent fuel pool from that reviewed and approved in the operating license review and as described in the FSAR. These design changes would provide for the replacement of the existing fuel storage racks with a High Capacity Fuel Assembly Storage Rack. The modified facility would increase the fuel storage capacity of the Unit 3 spent fuel pool from 216 to 474 fuel assemblies. The amendments would revise the Technical Specifications to reflect the resultant minimum edge-to-edge spacing between adjacent fuel assemblies and would identify the resultant change in the k effective.

The Commission's staff has evaluated the potential for environmental impact associated with operation of Oconee Units 1, 2, and 3 in the proposed manner. From this evaluation, the staff has determined that there will be no significant environmental impact attributable to the proposed action. Having made this determination, the Commission has further concluded, pursuant to 10 CFR Part 51, Section 51.5(c)(1) that

OFFICE ➤						
SURNAME ➤						
DATE ➤						

no environmental impact statement need be prepared for this action. Copies of the Negative Declaration, which is being filed with the Office of the Federal Register for publication and the Environmental Impact Appraisal are enclosed.

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

Sincerely,

Original signed by
R. A. Purple

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

Enclosures:
1. Amendment No. 35 to DPR-38
2. Amendment No. 17 to DPR-47
3. Amendment No. 14 to DPR-55
4. Negative Declaration
5. Environmental Impact Appraisal
6. Safety Evaluation
7. Federal Register Notice

cc w/enclosures:
See next page

DISTRIBUTION
Docket Files(3)
NRC PDRs(3)
Local PDR
ORB#1 Reading
JRBuchanan
TBAbernathy
OI&E(3)
OELD
ACRS(16)
KRGoller
TJCarter
JMcGough
RAPurple
GGZech
SMSheppard
DEisenhut
SVarga
JSaltzman
PCollins
CHebron
AESteen
PKreutzer(2)
NDube
BJones(12)
BScharf(15)
BGiardina
VBenaroya
FSehurer
LShao
SBlock
EConti
WBrooks
DRoss

	TR:APCSB	TR:SEB
	VBenaroya	LShao
	11/ /75	11/ /75

OFFICE	RL:ORB#1	TR:CPB	TR RAB	OELD	RL:ORB#1	RL:OR
SURNAME	GGZech:dc	DRoss	EConti		RAPurple	KRGoller
DATE	11/24/75	11/ /75	11/ /75	11/ /75	11/ /75	11/ /75

cc w/enclosures:
Mr. William L. Porter
Duke Power Company
P. O. Box 2178
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 & incoming:
Mr. Elmer Whitten
State Clearinghouse
Office of the Governor
Division of Administration
1295 Pendleton Street
4th Floor
Columbia, South Carolina 29201

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

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 17
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 September 12, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-38 is hereby amended to read as follows:

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

"B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No.27."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by
Karl Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Reactor Licensing

Attachment:
Change No. 27 to the
Technical Specifications

Date of Issuance: DEC 22 1975

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

DUKE POWER COMPANY

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 17
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 September 12, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-47 is hereby amended to read as follows:

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

"B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 33."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by
Karl Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Reactor Licensing

Attachment:
Change No. 33 to the
Technical Specifications

Date of Issuance: DEC 22 1975

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

DUKE POWER COMPANY

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 14
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 September 12, 1975, 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; and

   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.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Facility License No. DPR-55 is hereby amended to read as follows:

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

"B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 14."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by
Karl Goller

Karl R. Goller, Assistant Director
for Operating Reactors
Division of Reactor Licensing

Attachment:
Change No. 14 to the
Technical Specifications

Date of Issuance: DEC 22 1975

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 17 TO FACILITY LICENSE NO. DPR-38
CHANGE NO. 27 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 17 TO FACILITY LICENSE NO. DPR-47
CHANGE NO. 22 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 16 TO FACILITY LICENSE NO. DPR-55
CHANGE NO. 14 TO TECHNICAL SPECIFICATIONS

DOCKET NOS. 50-260, 50-270 AND 50-287

Revise Appendix A as follows:

Remove pages 5.4-1 and 5.4-1a and insert identically numbered pages.

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 U^{235}.

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 U^{235} or the equivalent. 27 23 14

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.

5.4.2 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. 27 14

5.4.2.2 Whenever there is fuel in the pool (except the initial core loading), 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.

DEC 22 1975

5.4.2.3 Spent fuel may also be stored in storage racks in the fuel transfer canal when the canal is at refueling level.

5.4.2.4 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

DEC 22 1975

NEGATIVE DECLARATION

REGARDING PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS OF LICENSE NO. DPR-55 OCONEE NUCLEAR STATION UNIT 3 DOCKET NUMBER 50-287

The Nuclear Regulatory Commission (the Commission) has considered the issuance of a change to the Technical Specifications of Facility Operating License No. DPR-55 for Oconee Nuclear Station located in Oconee County, South Carolina. The changes would authorize the licensee, Duke Power Company, to replace existing spent fuel storage racks having a capacity of 216 assemblies with high capacity fuel assembly storage racks having a maximum capacity of 474 assemblies.

The Commission's Division of Reactor Licensing has appraised the environmental impact of the proposed change. On the basis of this appraisal, the Commission has concluded that an environmental impact statement for this particular action is not warranted because there will be no significant environmental impact attributable to the proposed action other than those impacts described in the Commission's Final Environmental Statement of March 1972 concerning the operation of Oconee Nuclear Station, Units 1, 2, and 3.

The environmental impact appraisal is available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C., and at the Oconee County Library, 201 South Spring Street, Walhalla, South Carolina 29691.

Dated at Rockville, Maryland, this 8 day of December 1975.

FOR THE NUCLEAR REGULATORY COMMISSION

Gordon K. Dicker

Gordon K. Dicker, Chief
Environmental Projects Branch 2
Division of Reactor Licensing

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

ENVIRONMENTAL IMPACT APPRAISAL BY THE DIVISION OF REACTOR LICENSING

SUPPORTING AMENDMENT NO. 14 TO LICENSE NO. DPR-55

CHANGE NO. 14 TO THE TECHNICAL SPECIFICATIONS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION UNIT 3

ENVIRONMENTAL IMPACT APPRAISAL

1. Description of Proposed Action

By letter dated September 12, 1975, Duke Power Company (the licensee) proposed to change the spent fuel storage design for the Oconee Nuclear Station Unit 3 from that which was described in the FSAR and approved in the operating license review. The purpose of the change is to enlarge the spent fuel facility storage capacity from 216 to 474 fuel assemblies.

During the earlier reviews (construction permit and operating license stages), the environmental aspects of the operation of this spent fuel storage pool was included in the staff's overall assessment of the plant's components. No specific environmental impact was attributed to the storage pool although when filled with spent fuel, it would be a minor contributor (27.3×10^6 BTU/hr) to the overall heat load (in excess of $5{,}000 \times 10^6$ BTU/hr) discharged from the plant into Lake Keowee during normal operation and also to the total radioactive waste generated by the plant.

The change proposed by the licensee involves the replacement of the existing spent fuel storage racks which have a capacity of 216 assemblies, with the Combustion Engineering, Incorporated, supplied high capacity fuel assembly racks. The new racks will havea maximum capacity of 474 fuel assemblies with a reduced center-to-center spacing. The new racks will not require changing the basic structural geometry of the spent fuel storage pool.

Currently, spent fuel is not being reprocessed on a commercial basis in the United States. The Nuclear Fuel Services (NFS) plant in New York was shut down in 1972 for alterations and expansion. The Allied General Nuclear Services (AGNS) proposed plant is under construction in South Carolina and this facility is not licensed to operate. The General Electric Company's (GE) Midwest Fuel Recovery Plant in Illinois is in a decommissioned condition.

Although no plants are licensed for reprocessing fuel, the GE and NFS facilities are licensed for storing spent fuel and applications have been filed for permission to expand these facilities. Also, AGNS has applied for a license to receive and store irradiated fuel assemblies prior to a decision on the licensing action relating to the separations facility. Construction of the AGNS receiving and storage station itself is complete.

The Commission's staff projects that by the end of calendar year 1975, the GE storage facility will have no unfilled storage capacity and the NFS facility will have space available for 85 metric tons of uranium. If its pending license application is approved, the AGNS facility could have licensed storage space for 400 metric tons of uranium in early 1976.

The expansion of the licensee's storage pool by 258 assembly spaces would permit additional storage of as much as 135 tons of uranium oxide. If no corrective action is taken, the present capacity for storing spent fuel at the Oconee Nuclear Station would be filled in mid 1978. The earliest that spent fuel reprocessing could begin on a commercial basis, if authorized, would be late 1976. Even if limited reprocessing should begin at that time there would still be a shortage of spent fuel storage capacity by 1978. By increasing the capacity as proposed, the spent fuel storage racks will not be filled until late 1979.

2. Analysis of Potential Environmental Impacts of Proposed Action

Using the same guidelines as those employed during its earlier environmental reviews, we have assessed the potential impacts, both radiological and nonradiological, that might result from the construction and operations of an expanded spent fuel facility.

We cannot identify any potential effect on the environs outside of the building that houses the spent fuel storage pool that will result from the proposed construction work. Within this building, the impacts are expected to be limited to those normally associated with metal working activities.

Similarly, we cannot identify any adverse problems that will occur onsite and in the surrounding environs when the licensee increases the number of fuel assemblies in the pool above 216. Although the closed cycle cooling water system will not be modified, the licensee and we believe that the heat load (27.3×10^6 BTU/hr) resulting from the increase in storage capacity can be dissipated without the bulk fluid temperature exceeding the 150°F design limit of the original design. This additional heat load is approximately 0.5 percent of the total heat discharged from the plant and is not considered significant.

During storage of spent fuel under water, radioactive wastes are released through both liquid and gaseous pathways. Small amounts of fission and activation products such as isotopes of cesium and cobalt are released from the surfaces of the assemblies and are dispersed in solution or as particulates in the borated cooling water. The licensee employs a continuous water purification system to remove these liquid wastes through filtration or demineralization, thereby maintaining the quality of the water at a high level and the radiation background at a minimum.

An increase in the number of spent fuel assemblies in the pool will increase the amount of long-lived radionuclides, primarily cesium-134 and cesium-137 transferred to the cooling water. Therefore, the principal results will be more rapid depletion of filters and demineralizers resulting in more frequent replacement of these purification components, thereby leading to a minimal increase in the amount of solid radioactive waste generated by the plant.

Based on the spent fuel pool source terms and other facility spent fuel pool dose rate calculations and measurements using respective source terms, normally greater than those calculated for Oconee, we have calculated dose equivalent rates of approximately 1.5 mrem/hr at three feet above the fuel pool surface. Using 1.5 mrem/hr, a conservative estimate, and the 240 man-hrs occupancy factor, our calculation of maximum dose during normal fuel pool operations is 0.360 man-rem/refueling.

The licensee has supplied current information related to the probable transfer of 150 spent fuel assemblies from Unit 1 and 2 spent fuel pool to Unit 3 spent fuel pool. The transfer of 150 elements would be the maximum number to occur over the life of the plant. The dose rate for the transfer of 150 assemblies is calculated to be approximately 15 man-rem..

Radioactive gases may be released from the spent fuel directly into the atmosphere of the fuel building. Under normal conditions, this atmosphere is exhausted with the ventilation air without treatment unless radiation measurements exceed a predetermined value. We have calculated that gaseous waste, principally krypton-85, will increase by 289 Ci/yr for the additional two years gained by the increased storage, based on a 1/3 core reload every 13 months. Based on these calculations, we find that the proposed modification will have an insignificant effect on radioactive materials released from the site and is, therefore, acceptable.

3. Consideration of Environmental Factors

On September 16, 1975, the Commission announced (40 FR 42801) its intent to prepare a generic environmental impact statement on handling and storage of spent fuel from light water power reactors. In this notice, the Commission also announced its conclusion that it would not be in the public interest to defer licensing actions intended to ameliorate a possible shortage of spent fuel storage capacity pending completion of the generic environmental impact statement. In reaching this conclusion, the Commission indicated that five specific factors would be applied, weighed, and balanced within the context of the required environmental statement or appraisal in reaching individual licensing determinations. These five factors are discussed in this section.

a. Does the licensing action here proposed have a utility that is independent of the utility of other licensing actions designed to ameliorate a possible shortage of spent fuel capacity?

The proposed licensing action is required solely to meet the needs of the Oconee Nuclear Units for spent fuel storage until such time as commercial storage is available. Based on conversations with the licensee there are no plans to store spent fuel from a source other than the Oconee units in the spent fuel racks at Oconee. Hence the present licensing action will have no effect on other licensing actions designed to ameliorate a possible shortage of spent fuel capacity.

b. Does the taking of the action here proposed prior to the preparation of the generic statement constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity?

It is not likely that the taking of the licensing action here proposed would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing action designed to ameliorate a possible shortage of spent fuel storage capacity. The time frame under consideration is two years, the staff's estimate of the time necessary to complete the generic environmental statement. The action here proposed will not have any significant effect on whether similar actions are or should be taken at other nuclear reactors since it will not affect either the need for or availability of storage facilities at other nuclear reactors. Nor will the added capacity here significantly affect the need for the total additional storage space presently planned

at reprocessing facilities for which licensing actions are pending.

c. Can the environmental impacts associated with the proposed action be adequately addressed within the context of the license application without overlooking any cummulative environmental impacts?

The licensee has presented the need for additional storage capacity solely on the basis of this station. Because the additional capacity is for this site alone and for this licensee only, all the environmental impacts can be assessed within the context of this application. As noted in paragraph 2 above, the environmental impacts of the proposed action are negligible, readily defined, and limited to the environs of the Oconee station. Accordingly, it is not likely that any significant cummulative environmental impacts have been overlooked.

d. Have all technical issues which have arisen during the review of this application been resolved within that context?

The accompanying Safety Evaluation Report addresses the technical review of the proposed fuel pool expansion. All issues which arose during the course of this review were totally resolved within the context of the application.

e. Would a deferral or severe restriction on this licensing action result in substantial harm to the public interest?

If the proposed expansion is not authorized, and assuming no off-site storage is available, which appears likely, the present Oconee Station spent fuel storage capacity will be filled by mid-1978. Over the ensuing year all three units would be required to shutdown.

If the proposed action is deferred such that it cannot be completed prior to September 1976 (the time for refueling of Unit 3), subsequent power operation of Unit 3 will be correspondingly delayed because the refueling of Unit 3 cannot proceed until the pool is refilled with water after completion of the modifications.

If the initiation of the proposed action is deferred until after the next Unit 3 refueling (September 1976) it would be necessary to transfer Unit 3 spent fuel to the Units 1 and 2 storage pool in order to accomplish the construction work. This is undesirable because the extra fuel handling involved would cause increased radiation exposure to personnel and added costs to the licensee. In addition, the racks in the Unit 3 pool would require decontamination following the Unit 3 refueling and prior to commencing the proposed modifications. This would involve additional exposure and costs. Finally, the time required to complete the construction work is such that Unit 2 would be unable to unload fuel at its scheduled refueling outage in 1977 and subsequent operation of that unit would be delayed.

The alternative of storing spent fuel in the storage pool of another nuclear reactor also compares poorly with the proposed action. The licensee would be using storage space which the receiving reactor might need later. The handling and transporting necessary to move fuel to another reactor facility could be avoided if additional storage at reprocessing facilities were licensed during the additional storage period at Oconee Nuclear Station.

The licensee does not anticipate that storage space will be available commercially for the receipt of spent fuel from the Oconee Nuclear Station before the existing storage capacity is filled. The licensee has no contract which would guarantee a sufficient portion of the minimal amount of commercial storage capacity expected to exist, even if spent fuel reprocessing is commenced in late 1976.

In view of the above, a deferral or severe restriction on this licensing action would not allow its completion in the future without forcing a shutdown of one or more of the Oconee Units. This would adversely affect the ability of Duke Power Company to meet electrical energy needs and possibly force the operation of less economical plants or which have greater environmental impact, thus adversely affecting the public interest.

4. Summary

The Oconee Station spent fuel pools could be filled by mid-1978. The proposed action is intended to ameliorate this possible shortage. A review of the five factors identified in the Commission's announcement of September 10, 1975, has revealed that the factual circumstances of the proposed licensing action are consistent with the Commission's general conclusions with respect to those factors. The environmental impacts of the proposed action are negligible and the action would not foreclose any of the alternatives being considered in the generic environmental impact statement being prepared by the Commission. Prompt approval of the proposed action is required to avoid unnecessary down time of one or more of the Oconee units.

5. Conclusion and Basis for Negative Declaration

Having applied, weighed, and balanced the five specific factors required by the Nuclear Regulatory Commission (40 FR 42801), the staff finds that any environmental consequences that might reasonably be associated with the proposed action would result in no significant change in the environmental impact as analyzed and set forth in the Final Environmental Statement, issued March 1972, concerning operation of the Oconee Nuclear Station, Units 1, 2, and 3. The Commission has concluded that no environmental impact statement for the proposed action need be prepared and that, pursuant to 10 CFR 51.5(c), a negative declaration to this effect is appropriate.

Date: December 22, 1975

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 17 TO FACILITY LICENSE NO. DPR-38
CHANGE NO. 27 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 17 TO FACILITY LICENSE NO. DPR-47
CHANGE NO. 22 TO TECHNICAL SPECIFICATIONS;

AMENDMENT NO. 14 TO FACILITY LICENSE NO. DPR-55
CHANGE NO. 14 TO TECHNICAL SPECIFICATIONS

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2 AND 3

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

Introduction

By letter dated September 12, 1975, 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 1, 2, and 3. The proposed amendments would allow changes in the design of the Unit 3 spent fuel pool from that reviewed and approved in the operating license review and as described in the FSAR. These design changes would provide for the replacement of the existing fuel storage racks with a High Capacity Fuel Assembly Storage Rack. The modified facility would increase the fuel storage capacity of the Unit 3 spent fuel pool from 216 to 474 fuel assemblies. The requested amendments would revise the Technical Specifications to reflect the resultant minimum edge-to-edge spacing between adjacent fuel assemblies and would identify the resultant change in the k effective.

Discussion

The existing spent fuel storage facilities at the Oconee Nuclear Station consist of a common spent fuel pool for Units 1 and 2 and a separate spent fuel pool for Unit 3 with a resultant total storage capacity of 552 fuel assemblies. The common fuel storage pool for Units 1 and 2 could accomodate 336 assemblies whereas the Unit 3 pool capacity is presently 216 fuel assemblies.

The present spent fuel storage rack design has an assembly center-to-center spacing of 21 inches which assures a k effective of less than 0.9, assuming unborated water in the pools. The existing spent fuel pool cooling system for each pool is designed to maintain the pool water at 150°F or less with the maximum predicted number of spent fuel assemblies discharged to the pool.

The licensee is proposing to increase the spent fuel capacity of the Unit 3 pool from 216 to 474 fuel assemblies. This would be accomplished by replacing the existing storage racks with a new High Capacity Fuel Assembly Storage Rack having a smaller center-to-center fuel assembly spacing. The new rack would consist of an array of one quarter inch thick stainless steel storage cavities having a nominal center-to-center spacing of 14.090 inches; each storage cavity can accomodate one fuel assembly. The fuel assembly storage cavities would be structurally connected to form ten fuel assembly storage modules by means of dimensionally controlled steel channels which would limit the structural deformations and maintain the required center-to-center spacing between adjacent fuel assembly storage cavities. All ten modules would be interconnected and rest on the pool floor. The High Capacity Fuel Assembly Storage Rack and its associated structures are designed to seismic Category I criteria.

Evaluation

Our review of the licensee's proposal consisted of a detailed analysis of each area in which potential safety considerations were involved. Each of these areas is evaluated separately below.

1. Criticality Analysis

The center-to-center spacing of assemblies in the new storage rack would be reduced from 21 inches to a minimum of 14.090 inches nominal. This would tend to increase the effective neutron multiplication factor, k effective, of the array. We have reviewed the licensee's analysis of the proposed fuel storage configuration to determine the margin to criticality afforded by the proposed design. The calculations were performed with a transport theory code DOT-2W which has been qualified by comparison with critical experiments. The calculated value of k effective for the proposed rack design has been determined to be 0.936, including all uncertainties. The effect of credible non-normal distributions of fuel assemblies has been calculated and determined to be 0.002 k effective. We have therefore found the criticality analysis of the proposed storage rack to be acceptable.

2. Rack Structural Design

The licensee submitted a detailed seismic design analysis of the proposed new storage rack which included the use of appropriate codes and floor response spectra. The results of this analysis were combined with those from other suitable loadings and compared against acceptable allowable stress levels and deflection criteria. We have concluded that the procedures used and the results achieved show that the rack design is acceptable.

3. Thermal Considerations

The existing spent fuel pool cooling system is a seismic Category I system with a sufficient cooling capacity to keep the spent fuel pool water temperature to less than 150°F for 216 fuel assemblies. The licensee submitted an evaluation of this system to determine whether it would retain the capability to cool the pool to the design temperature, considering the increased heat load due to the increased storage capacity. We independently reviewed the system and agree with the licensee's conclusion that the existing cooling system has sufficient capacity to maintain the spent fuel pool at less than 150°F for the most adverse loading condition.

We additionally analyzed the spent fuel pool heatup time in the event that the spent fuel pool cooling system should fail. The minimum time to reach the boiling point from a pool water temperature of 150°F was determined to be 6.7 hours under the most adverse conditions. Even in the event of a complete system failure other sources of makeup would be available for addition to the pool. These sources would include the Borated Water Storage Tank, the Reactor Coolant Bleed Tank or the Concentrated Boric Acid Storage Tank. We therefore conclude that in the unlikely event of a complete failure of the spent fuel pool cooling system there would be more than sufficient time for an operator to either effect repairs or connect additional cooling.

4. Radiation Levels

Oconee Unit 3 spent fuel pool is not presently being used for new or spent fuel storage. The unirradiated fuel for the initial cycle of Unit 3 was temporarily stored in the pool prior to loading, however, spent fuel has neven been stored in the Unit 3 pool. In view of this, surface contamination in the pool due to plate out of fission products is non-existant and the work performed by personnel in removing the existing storage racks and installing the proposed racks would not involve any radiological control problems.

The resultant effect on the above pool dose rates to personnel as a result of increasing the number of stored spent fuel assemblies has been determined to be negligible. The basis for this conclusion is the batch manner in which fuel would be added to the pool. Spent fuel assemblies become less significant as a source of radionuclides as time progresses due to the decrease in fission product diffusion as the fuel temperature decreases. In addition, radionuclides present would decay with time and would be removed from the pool by the Spent Fuel Cooling System demineralizers. The contributions of each batch are, therefore, reduced significantly before the next successive batch of spent fuel is placed in the pool. Thus, at the end of the fuel cycle before the next batch is put into the spent fuel pool, the effects of the preceding fuel batches would be minimized. We, therefore, agree that the resulting dose rate due to increased spent fuel pool storage would be negligible and therefore the dose levels described in the Oconee FSAR Section 11.2.1.1 would remain unchanged.

In view of the above, we conclude that the resultant effect on the site radiation levels as a result of the proposed change would be acceptable.

5. Accident Considerations

The potential radiological consequences of a fuel handling accident involving mechanical damage to a fuel assembly are analyzed in the Oconee FSAR Section 14.2.2.1 and in FSAR Supplement 1, page 1-20. Although the new storage rack would accomodate a larger inventory of spent fuel, the rack would extend a sufficient distance above the stored fuel assemblies to protect the fuel from the accidental drop of a single assembly. The consequences of such a postulated accident would therefore be no more severe than those previously analyzed and determined to be acceptable.

6. Postulated Spent Fuel Cask Drop Accident

An analysis of the consequences of a postulated spent fuel cask drop accident was submitted by the licensee as Revision 35 to the Oconee FSAR. In response to a request for additional information, the licensee submitted an additional analysis by letter dated November 3, 1975. The staff review of the spent fuel cask drop analysis for Oconee Units 1, 2, and 3 is scheduled for completion in early 1976.

In view of the current shortage of offsite spent fuel space and spent fuel reprocessing capability, the licensee does not anticipate shipping spent fuel offsite for approximately 5 years. The spent fuel cask may possibly be used to transfer spent fuel from the Unit 1 and 2 spent fuel pool to the Unit 3 spent fuel pool in about 4 years. Prior to the use of the spent fuel cask, the staff will determine the acceptability of the spent fuel cask drop analysis. Based on this fact, we have determined that a completed spent fuel cask drop accident analysis is not a prerequisite for our approval of the proposed modification.

In summary, we have determined that the proposed modifications to the Oconee Unit 3 spent fuel pool are acceptable because: (1) the design would preclude criticality for any moderating condition, (2) the rack structural design has adequately provided for seismic conditions, (3) the existing spent fuel pool cooling system has been analyzed to have sufficient capacity to provide adequate cooling for the increased heat load, and (3) the increased radiation doses both onsite and offsite would be negligible.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) 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: DEC 22 1975

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. 17, 17, and 14 to Facility Operating Licenses No. DPR-38, DPR-47, and DPR-55, respectively, issued to Duke Power Company which revised Technical Specifications for operation of the Oconee Nuclear Station, Units 1, 2, and 3, located in Oconee County, South Carolina. The amendments are effective as of the date of issuance.

These amendments allow changes in the design of the Unit 3 spent fuel pool from that reviewed and approved in the operating license review and as described in the FSAR. These design changes would provide for the replacement of the existing fuel storage racks with a High Capacity Fuel Assembly Storage Rack. The modified facility would increase the fuel storage capacity of the Unit 3 spent fuel pool from 216 to 474 fuel assemblies. The amendments would revise the Technical Specifications to reflect the resultant minimum edge-to-edge spacing between adjacent fuel assemblies and would identify the resultant change in k effective.

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. Notice of Proposed Issuance of Amendments to Facility Operating Licenses in connection with this action was published in the FEDERAL REGISTER on October 2, 1975 (40 FR 49158). No request for a hearing or petition for leave to intervene was filed following notice of the proposed action.

For further details with respect to this action, see (1) the application for amendments dated September 12, 1975; (2) Amendments No. 17, 13 and 14 to Licenses No. DPR-38, DPR-47, and DPR-55, with Changes No. 27, 22, and ; (3) the Commission's related Safety Evaluation; (4) the Negative Declaration; and (5) the 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), (3), (4), and (5), may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland, this DEC 22 1975

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
R. A. Purple

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

	TR:APCSB	TR:SEB				
	VBenaroyg	LShao				
	11/ /75	11/ /75				
OFFICE ▶	RL:ORB#1	TR:CPB	TR:RAB	OELD	RL:ORB#1	RL:OR
SURNAME ▶	GGZech:dc	DRoss	EConti		RAPurple	KRGoller
DATE ▶	11/24/75	11/ /75	11/ /75	11/ /75	11/ /75	11/ /75