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

August 6, 1987

DO NOT REMOVE

*Posted*  
*Amdt. 160*  
*to DPR-47*

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

Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
Duke Power Company  
422 South Church Street  
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Issuance of Amendment Nos. 160, 160, and 157 to Facility Operating Licenses DPR-38, DPR-47, and DPR-55 - Oconee Nuclear Station, Units 1, 2, and 3 (TAC Nos. 61818, 61819, 61820)

The Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 160, 160, and 157 to Facility Operating Licenses Nos. DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station, Units 1, 2, and 3. These amendments consist of changes to the Station's common Technical Specifications (TSs) in response to your request dated November 19, 1985 as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987.

The amendments revise the TSs to allow the use of the multielement (three-fuel-assembly) spent fuel casks in the Oconee Unit 3 spent fuel pool.

A copy of our Safety Evaluation is also enclosed. Notice of issuance of the enclosed amendments will be included in the Commission's bi-weekly Federal Register notice.

Sincerely,

Helen N. Pastis, Project Manager  
Project Directorate II-3  
Division of Reactor Projects - I/II

Enclosures:

1. Amendment No. 160 to DPR-38
2. Amendment No. 160 to DPR-47
3. Amendment No. 157 to DPR-55
4. Safety Evaluation

cc w/enclosures: See next page

Mr. H. B. Tucker  
Duke Power Company

Oconee Nuclear Station  
Units Nos. 1, 2 and 3

cc:

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Raleigh, North Carolina 27603

Honorable James M. Phinney  
County Supervisor of Oconee County  
Walhalla, South Carolina 29621



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. 160  
License No. DPR-38

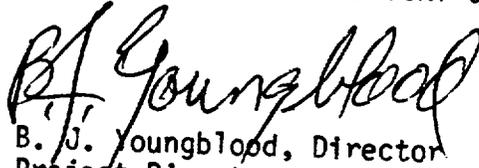
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 1 (the facility) Facility Operating License No. DPR-38 filed by the Duke Power Company (the licensee) dated November 19, 1985 as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987, 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 set forth in 10 CFR Chapter 1;
  - D. The issuance of this license 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 attachments to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-38 is hereby amended to read as follows:

3.B Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 160, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



B. J. Youngblood, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II

Attachment:  
Technical Specification  
Changes

Date of Issuance: August 6, 1987



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. 160  
License No. DPR-47

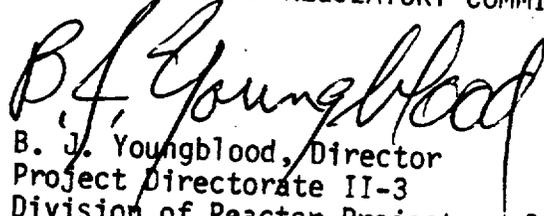
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility) Facility Operating License No. DPR-47 filed by the Duke Power Company (the licensee) dated November 19, 1985 as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987, 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 set forth in 10 CFR Chapter 1;
  - D. The issuance of this license 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 attachments to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-47 is hereby amended to read as follows:

3.B Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 160, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION



B. J. Youngblood, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II

Attachment:  
Technical Specification  
Changes

Date of Issuance: August 6, 1987



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. 157  
License No. DPR-55

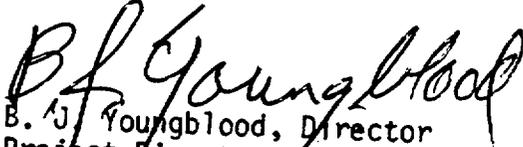
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 3 (the facility) Facility Operating License No. DPR-55 filed by the Duke Power Company (the licensee) dated November 19, 1985 as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987, 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 set forth in 10 CFR Chapter 1;
  - D. The issuance of this license 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 attachments to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-55 is hereby amended to read as follows:

3.B Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 157, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

  
B. J. Youngblood, Director  
Project Directorate II-3  
Division of Reactor Projects - I/II

Attachment:  
Technical Specification  
Changes

Date of Issuance: August 6, 1987

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 160 TO DPR-38

AMENDMENT NO. 160 TO DPR-47

AMENDMENT NO. 157 TO DPR-55

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

Replace the following page of the Appendix "A" Technical Specifications with the attached page. The revised page is identified by amendment number and contains a vertical line indicating the areas of change.

Remove  
Page

3.8-2

Insert  
Page

3.8-2

- 3.8.9 If any of the above specified limiting conditions for fuel loading and refueling are not met, movement of fuel into the reactor core shall cease; action shall be initiated to correct the conditions so that the specified limits are met, and no operations which may increase the reactivity of the core shall be made.
- 3.8.10 The reactor building purge system, including the radiation monitor, RIA-45, which initiates purge isolation, shall be tested and verified to be operable immediately prior to refueling operations.
- 3.8.11 Irradiated fuel shall not be moved from the reactor until the unit has been subcritical for at least 72 hours.
- 3.8.12 Two trains of spent fuel pool ventilation shall be operable with the following exceptions:
- With one train of spent fuel pool ventilation inoperable, fuel movement within the storage pool or crane operation with loads over the storage pool may proceed provided the operable spent fuel pool ventilation train is in operation and discharging through the Reactor Building purge filters.
  - With no spent fuel pool ventilation filter operable, suspend all operations involving movement of fuel within the storage pool or crane operations with loads over the storage pool until at least one train of spent fuel pool ventilation is restored to operable status.
  - This specification does not apply during reracking operations with no fuel in the spent fuel pool.
- 3.8.13
- Prior to spent fuel cask movement in the Unit 1 and 2 spent fuel pool, spent fuel stored in the first 36 rows of the pool closest to the spent fuel cask handling area shall be decayed a minimum of 55 days.
  - Prior to spent fuel cask movement in the Unit 3 spent fuel pool, spent fuel stored in the first 33 rows of the pool closest to the spent fuel cask handling area shall be decayed a minimum of 70 days.
- 3.8.14 No suspended loads of more than 3000 lbm shall be transported over spent fuel stored in either spent fuel pool.
- 3.8.15
- No fuel which has an enrichment greater than 4.0 weight percent  $U^{235}$  (53 grams of  $U^{235}$  per axial centimeter of fuel assembly) will be stored in the spent fuel pool for Unit 3.
  - No fuel which has an enrichment greater than 4.3 weight percent  $U^{235}$  (57 grams of  $U^{235}$  per axial centimeter of fuel assembly) will be stored in the spent fuel pool for Units 1 and 2.

#### Bases

Detailed written procedures will be available for use by refueling personnel.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. DPR-38  
AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. DPR-47  
AMENDMENT NO. 157 TO FACILITY OPERATING 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 application dated November 19, 1985 as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987, Duke Power Company (the licensee) proposed changes to the Technical Specifications (TSs) of Facility Operating Licenses Nos. DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station, Units 1, 2 and 3. These amendments would consist of changes to the Station's common TSs to allow the use of the multielement (three-fuel-assembly) spent fuel casks in the Oconee Unit 3 spent fuel pool.

The proposed amendments increase the region of Oconee Unit 3 spent fuel racks within the spent fuel pool with limits on the spent fuel cask movement from 31 to 33 rows. No change is needed for the Oconee Units 1 and 2 TSs on the combined spent fuel pool. The proposed changes are needed to allow the licensee to use the multielement spent fuel casks to transfer fuel from Oconee to its McGuire Nuclear Station.

The June 5, 1987 submittal provided information on the shipment of fuel and did not alter the scope of the application noticed in the Federal Register on March 12, 1987, or affect the staff's initial no significant hazards determination.

DISCUSSION

To retain spent fuel storage capacity at Oconee, the licensee is presently transferring Oconee spent fuel to its McGuire Nuclear Station in single fuel assembly spent fuel casks. By letter dated July 26, 1985, the staff issued Amendment No. 44 to Facility Operating License NPF-9 and Amendment No. 25 to NPF-17 for the McGuire Nuclear Station, Units 1 and 2 to receive, possess and store irradiated fuel assemblies from Oconee. To expedite these spent fuel transfers, the licensee plans to use the multielement spent fuel casks (TN-8L or TN-8) which will result in larger and heavier multielement casks being used in the Oconee spent fuel pools.

To mitigate the consequences of potential cask drop events, the current TS 3.8.13.b allows the movement of spent fuel casks in the Oconee Unit 3 spent fuel pool only after the first 31 rows of spent fuel located closest to the spent fuel handling area have decayed for at least 70 days. Radiological consequence calculations for a hypothetical worst case cask drop event involving the heavier multielement spent fuel casks indicate that the spent fuel stored in the first 33 rows of the storage racks closest to the cask handling area must have decayed for at least 70 days for the radiation-dose resulting from the accidental cask drop event to be less than the limits under accident conditions set forth in 10 CFR Part 100. Therefore, to allow the use of heavier multielement spent fuel casks in the Oconee Unit 3 spent fuel pool, the licensee proposes to change the number of spent fuel rows in TS 3.8.13.b from 31 rows to 33 rows. The current accident analysis for the Oconee Units 1 and 2 spent fuel pool bounds the use of the multielement spent fuel casks. Therefore, TS 3.8.13.a which governs spent fuel cask movement in the Oconee Units 1 and 2 spent fuel pool is not being changed.

### EVALUATION

The multielement fuel casks are larger and heavier than the single element casks previously approved for use. The licensee has provided a summary of the results of an evaluation of the load handling features to be utilized with the multielement casks. These results indicated that existing cask platforms, operating decks and handling and lifting devices are adequate to safely handle the multielement casks. Further, these features are essentially unchanged from those used to handle the single element spent fuel cask and which were previously approved by the staff. The staff, therefore, finds the load handling provisions for the multielement casks to be satisfactory.

The licensee also summarized their evaluations of the consequences of a hypothetical cask/heavy-load drop accident involving the heavier multielement spent fuel casks in the Oconee Unit 3 spent fuel pool. The worst case failure is considered to be a hoist cable break when the cask is positioned over the fuel pool wall and the cask has an eccentric drop into the wall. In this case, the yoke and load block would be deflected onto the spent fuel resulting in damage to the fuel assemblies. There are 148 fuel storage positions under the projected cask, yoke, and block impact area. These storage racks buckle and deflect into adjacent racks until the total energy of the falling cask is absorbed. In total, 518 fuel storage racks can potentially incur a loss of integrity from impact during a cask drop accident.

The radiological consequences of the cask drop accident will be mitigated by limiting the age of fuel stored in the first 33 rows. No cask movement will be allowed if fuel in these locations has decayed less than 70 days. The worst radiological consequences experienced would result from 100 percent of the activity contained in the fission gases trapped in gaps in the fuel stored in the locations being released into the pool water. The licensee has calculated an exclusion area boundary dose, taking no credit for ventilation system filtration, of 0.1 rem whole body and 23 rem to the thyroid. The staff has performed an independent calculation and determined a dose to the thyroid of approximately 50 rem. These doses are a small fraction of the 10 CFR Part 100 limits.

The staff has reviewed the licensee's summary analysis concerning the postulated multielement cask drop accident and the resulting consequences. The staff finds that the licensee's analysis is reasonable and satisfactorily demonstrates that a cask drop will not result in unacceptable consequences. Based on the above, the staff concludes that the proposed change to Oconee, Unit 3 Technical Specification 3.8.13.b to impose limits on spent fuel decay in the first 33 storage rack rows is acceptable since the licensee has demonstrated that offsite doses resulting from damage to spent fuel from a postulated drop of the multielement spent fuel cask are below a small fraction of the 10 CFR Part 100 limits.

#### ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of this amendment will have no significant impact on the environment (52 FR 29098).

#### CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (52 FR 7682) on March 12, 1987, and consulted with the state of South Carolina. No public comments were received, and the state of South Carolina did not have any comments.

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.

Principal Contributors: R. Ferguson  
M. Wohl  
H. Pastis  
J. Minns

Dated: August 6, 1987



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

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

7 AUG 1987

Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
Duke Power Company  
422 South Church Street  
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Environmental Assessment and Finding of No Significant Impact  
(TACs 61818, 61819, 61820)

We have enclosed for your information a copy of the Environmental Assessment and Finding of No Significant Impact associated with your November 19, 1985 amendment application as supplemented on June 16, 1986, February 18, 1987 and June 5, 1987. The proposed amendments would allow the use of the multielement spent fuel casks in the Oconee Nuclear Station, Unit 3 spent fuel pool.

The Environmental Assessment has been forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in cursive script that reads "Helen N. Pastis".

Helen N. Pastis, Project Manager  
Project Directorate II-3  
Division of Reactor Projects-I/II

Enclosure: As stated

cc: See next page

UNITED STATES NUCLEAR REGULATORY COMMISSION  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT  
ASSOCIATED WITH THE USE OF MULTIELEMENT  
SPENT FUEL CASKS IN THE OCONEE UNIT 3  
SPENT FUEL POOL  
DUKE POWER COMPANY  
OCONEE NUCLEAR STATION, UNIT 3  
FACILITY OPERATING LICENSE NO. DPR-55  
DOCKET NO. 50-287

The United States Nuclear Regulatory Commission (the Commission) is considering the issuance of a proposed amendment which would allow the use of multielement spent fuel casks in the Oconee Unit 3 spent fuel pool. Oconee Nuclear Station, Unit 3 is operated by Duke Power Company (the licensee) and is located in Oconee County, South Carolina.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action: The proposed amendment would revise the Technical Specification 3.8.13.b to allow use of the multielement spent fuel casks in the Oconee Unit 3 spent fuel pool.

On July 26, 1985, the Commission issued Amendment Nos. 44 and 25 to the licenses of the McGuire Nuclear Station, Units 1 and 2, to allow the receipt, possession and storage at McGuire of the irradiated spent fuel assemblies from the Oconee Nuclear Station. The McGuire licenses had limited such receipt of Oconee spent fuel at McGuire only in NFS-4 (NAC-1) and NLI-1/2 casks, which are single-element casks.

On August 29, 1986, the Commission issued Amendment Nos. 61 and 42 to the licenses of McGuire Units 1 and 2 to authorize the use of Transnuclear, Inc. multiement spent fuel shipping casks, Model Numbers TN-8 and TN-8L, for receipt of irradiated Oconee fuel.

The proposed amendments to the Oconee Unit 3 license would authorize the use of the TN-8 and TN-8L multiement spent fuel casks in the Oconee Unit 3 spent fuel pool. The proposed amendments would increase the region of Oconee Unit 3 spent fuel racks within the spent fuel pool; with limits on the spent fuel cask movement from 31 to 33 rows. No change is needed for the Oconee Units 1 and 2 Technical Specifications for their combined spent fuel pool. This change was requested in the licensee's application for amendments dated November 19, 1985. Additional information in support of the requested change was provided in the licensee's letters dated June 16, 1986, February 18, 1987 and June 5, 1987.

The Need for the Proposed Action: In its March 20, 1986 amendment application to the McGuire licenses on this issue, the licensee stated that to maintain acceptable reserve spent fuel storage capacity (needed for potential full core off-loading, reload batch and upender access) in the Oconee spent fuel pools, the licensee needs to use a multiement spent fuel shipping cask. The licensee states that in addition to maintaining the necessary shipment rate, multiement casks have the advantage of fewer shipments (and hence lower probability of adverse offsite impact), lower station manpower requirements and reduced total radiation exposure to personnel.

A. Transportation

TN-8 and TN-8L are multiement truck casks which are physically capable of accommodating up to three PWR fuel assemblies. The two models have the same dimensions, but TN-8L is about one ton lighter than TN-8's forty tons because

it has fewer external cooling fins and, hence, a lower maximum authorized heat load. These casks have received a Certificate of Compliance for Radioactive Materials Packages, which was recently reviewed by the Commission (Certificate No. 9015, Revision 12, expiration date January 31, 1991) Such certificates are issued by the Commission to certify that the packaging (i.e., cask) and contents meet applicable safety standards of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material." By letter dated June 17, 1986, the Commission acknowledged Duke Power Company as a registered user of TN-8 and TN-8L shipping casks pursuant to Section 71.12 of 10 CFR Part 71.

In meeting the requirements for obtaining a Certificate of Compliance, it was demonstrated that adequate containment exists under both normal and accident conditions. To satisfy normal condition requirements, the cask was required to withstand continuous exposure, i.e., equilibrium conditions, to direct sunlight at an ambient temperature of at least 130°F in still air and continuous exposure to an ambient temperature of at least -40°F in the shade in still air. It was also required to withstand rough handling which is typified by a one-foot free-fall on an unyielding surface in a manner that produces maximum damage or other conditions representative of rough handling, and vibrations normally incident to the mode of transport. Under these normal conditions (which are really fairly severe abnormal conditions), no release of radioactive material or coolant was allowed and shielding effectiveness was not allowed to be reduced. In addition, contamination of liquid or gaseous primary coolants could not exceed certain specified low levels.

The attendant accident condition requirements for cask qualification were much more severe. The cask was required to withstand very severe impact puncture, fire and immersion in water test criteria (Impact is defined

as a thirty foot free-fall onto an unyielding surface, in a manner that produces maximum damage. Puncture is represented by a forty inch free-fall onto a six inch diameter pin, mounted on an unyielding surface, at an altitude to produce maximum damage. Fire resistance requirements are that the cask withstand an exposure to an all-enveloping thermal radiating environment of at least 1475°F for thirty minutes and no external cooling for three hours thereafter. The cask was also required to withstand immersion in water. The 10 CFR Part 71 regulations required sequential application of the above conditions.) The cask was able to withstand immersion in water after it had been subjected successively to these impact, puncture and fire conditions.

No changes in the offsite or onsite transportation routes are involved with the proposed amendments. The transportation routes were previously approved by the Commission (see McGuire Nuclear Station, Units 1 and 2 Amendment Nos. 61 and 42 dated August 29, 1986 and the related Environmental Assessment (51 FR 30593). Upon arrival at the McGuire site, the multielement casks would be transported to the same unloading points designated for the single-element casks.) A given multielement cask would be transported either to the unloading point for Unit 1 or to the unloading point for Unit 2, but not to both. The licensee states that the contents of a given multielement cask will not be divided between the two McGuire spent fuel pools.

By letter dated January 15, 1987, the licensee addressed paragraphs (a) and (c) of 10 CFR 51.52, "Environmental effects of transportation of fuel and waste - Table S-4." Although the letter is associated with another amendment application on extending the expiration dates of the operating licenses, the information is pertinent here also. In a February 18, 1987 letter, the licensee submitted additional information on the transportation of Oconee spent fuel to the McGuire Nuclear Station. In an August 5, 1986

letter, the licensee gave information with respect to McGuire on the cask transportation issue. Paragraph (c) consists of a Table S-4 which represents the contribution to environmental costs of transportation of fuel (and waste) to and from a "typical" reactor. The types of reactors, fuel and modes of transportation for which Table S-4 applies are set forth in various subparagraphs of paragraph (a). A summary of the licensee's evaluation follows.

Oconee and McGuire are both light-water cooled nuclear power reactors with thermal power ratings of 2568 and 3411 megawatts, respectively, which is in accordance with the maximum power level of 3800 megawatts specified by subparagraph (a)(1). All shipments of Oconee irradiated fuel to McGuire will be by truck, which is consistent with subparagraph (a)(5) which recognizes use of truck, rail or barge. Table S-4 is based on an annual refueling and an assumption of sixty spent fuel shipments per reactor year. Presently, Oconee Nuclear Station is on an eighteen-month refueling cycle which would require less than 30 spent fuel shipments per reactor year. Reducing the number of fuel shipments will reduce the overall impacts associated with population exposure and accidents discussed in Table S-4. Table S-4 represents the contribution of such transportation to annual radiation dose per reactor year to exposed transportation workers and to the general public. Presently, Oconee Nuclear Station is authorized to slightly exceed the fuel enrichment and average fuel irradiation levels that are specified in 10 CFR 51.52(a) (2) and (3) as the bases for Table S-4. The radiation levels of the transport fuel casks are limited by the Department of Transportation and are not dependent on fuel enrichment and/or irradiation levels. Therefore, the estimated doses to exposed individuals per reactor year will not increase over that specified in Table S-4.

The expected heat content of the fully loaded cask in transit will be less than 10,200 BTU/hr, which represents less environmental impact from heat discharge than the impact of the 250,000 BTU/hr/cask in Table S-4. Shipments with the multielement cask would occur once per week and, therefore, the impact from traffic density would not exceed the density of less than one truck per day in Table S-4. With respect to weights specified in Table S-4, the licensee will observe truck weight limitations specified by Federal and State regulations and will obtain overweight permits from the State of North Carolina and the State of South Carolina; these permits ensure that repetitive overweight shipments will not have any significant adverse effect on the roadways.

Radiological exposure to transportation workers would be less than the four man-rem per reactor year of Table S-4 (i.e., Department of Transportation (DOT) regulations limit exposure in occupied areas of the truck to a maximum of two millirem per hour; at this limit, the three and a half hour trip 52 times a year with two people in the vehicle would not exceed an annual dose of 0.73 man-rem; actual exposures would be much less than the DOT limit.) There are no planned stops between Oconee and McGuire Stations, and therefore, no radiological exposure to onlookers is expected. The total population within a one mile wide corridor along the 172 mile route is about 124,000 people (which is small compared to the total population of 600,000 used in Table S-4) and the dose rates from the proposed casks are lower than those in Table S-4, therefore, annual doses to the general public from exposure to the casks in transit would be less than the 3 man-rem of Table S-4.

The environmental risk associated with accidents in transit (both radiological and non-radiological) would be small and less than the risks in Table S-4 because the 8944 miles per year for the proposed actions is less than the 155,000 vehicle miles per year upon which Table S-4 is based.

The Commission has reviewed the licensee's evaluation pursuant to 10 CFR 51.52 and finds that the reactor fuel and proposed transport mode meet the conditions of paragraph (a) to 10 CFR 51.52 and, therefore, are the type upon which Table S-4 is based. Accordingly, Table S-4 appropriately represents the environmental costs of transportation for the proposed amendments. The Commission finds that these environmental impacts are small and do not represent any significant adverse impact on the quality of the human environment.

The environmental impacts associated with the transshipment of Oconee spent fuel to the McGuire and Catawba Nuclear Stations were previously evaluated by the staff (Final Environmental Statement related to the Operation of Catawba Nuclear Station, January 1983) and the Atomic Safety and Licensing Appeal Board (ASAB-651, 14 NRC 307 (1981)) and found to be insignificant. These impacts would not be changed by the proposed license amendments. The current authorization to ship such spent fuel is limited to 300 fuel assemblies.

B. Handling

In support of its request for authorization to use TN-8 and TN-8L multi-element spent fuel casks for shipping Oconee irradiated fuel to McGuire, the licensee provided cask drop analyses (which evaluated the consequences of dropping or tipping, or a combination of both, of TN-8 and TN-8L casks in the Oconee spent fuel handling building), discussed the effects of the change upon the guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," and identified plant operating procedures and training associated with the use of the new casks.

Control procedures and plant cask handling procedures restrict the travel path of the cask and thus provide additional assurance that the cask will not fall and tip into the spent fuel pool. The procedures require the

cask to follow a prescribed path which restricts the cask approach to the cask pit to either side (i.e., the cask is precluded from approaching the cask pit in the direction of the spent fuel pool.) The prescribed path will further cause the cask's center of gravity to be located over the spent fuel cask pit such that any tipping of a dropped cask would be within the confines of the cask pit. The prescribed path also precludes the cask from passing over or near safety-related equipment and restricts the cask to areas designed to accommodate a dropped cask with only negligible damage to the structural concrete.

The staff has reviewed the licensee's analyses of the fuel cask drop accident and concludes that with the administrative control procedures, there is little likelihood that the cask will enter the spent fuel pool should it break free as postulated during cask handling. The staff also concludes that such an accident would not cause significant structural damage or damage to any safety-related equipment.

In April 1983, the staff completed a review of the Oconee Units 1, 2 and 3 overhead handling systems and programs used to handle heavy loads in the vicinity of the reactor vessel, near the spent fuel in the spent fuel pool, or in other areas where a load drop may damage safe shutdown systems or spent fuel. The staff review was based upon the guidelines of NUREG-0612. Plants conforming to these guidelines (1) have developed and implemented, through procedures and operator training, safe load travel paths such that, to the maximum extent practical, heavy loads are not carried over or near irradiated fuel or safe shutdown equipment, and (2) have provided sufficient operator training, handling system design, load-handling instructions and equipment inspection to ensure reliable operation of the handling systems. The staff concluded that these systems and programs for Oconee met the

guidelines of NUREG-0612. The information provided by the licensee for that NUREG-0612 review was reevaluated along with the above cask drop accident analyses, including the plant operating procedures associated with the use of the TN-8 and TN-8L spent fuel casks, the physical characteristics of the TN-8 and TN-8L spent fuel casks, use of the associated handling equipment, and plant staff training. The staff finds that in addition to the acceptability of the cask drop analyses and the procedures discussed above, the licensee is providing sufficient operator training, the handling system design has sufficient capability to handle the casks, and the load-handling instructions and equipment inspection will ensure reliable operation of the handling systems. The staff concludes that the cask handling system and associated procedures at Oconee meet the guidelines of NUREG-0612 for the TN-8 and TN-8L spent fuel casks, and therefore, that the probability of a cask drop event during handling of the multielement casks remains very unlikely and is not increased by the proposed license amendment.

The cask qualification requirements, which were met in obtaining a Certificate of Compliance (discussed above) imposed more severe conditions on the structural integrity of the cask and containment of its contents than would be experienced during handling at the Oconee site. These results provide assurance that the fuel and cask would remain intact in the event of a dropped cask handling at the Oconee site. In addition, as discussed above, a dropped cask would not enter the spent fuel pool nor cause significant damage to any safety-related equipment. Therefore, the radiological consequences would be no more severe than those associated with the use of the single-element casks.

Accordingly, we conclude that the handling aspects of the proposed amendments continue to represent only very small risks to the environment,

do not result in any adverse change in our previous Final Environmental Statement (FES) conclusions, and will not result in any significant adverse impact on the quality of the human environment.

C. Occupational Radiological Exposure

The licensee states that one advantage of the multi-element cask is that it results in less handling, only one third as many shipments, and therefore, less occupational exposure for the same number of fuel assemblies. The licensee has determined that the average radiation dose to workers at Oconee and McGuire stations using the single-element casks is 215 person-millirems for each individual shipment (i.e., 645 millirems for 3 individual shipments.) If, instead, the 3 spent fuel assemblies had been shipped using the TN-8 and TN-8L multi-element cask, the licensee estimates that the dose to all workers would have been no more than 615 person-millirems. Therefore, use of the multi-element cask is estimated to result in a reduction in occupational exposure of at least 10 person-millirems for each spent fuel assembly slippage.

D. Cumulative Effects

The proposed amendments would not increase the maximum number (i.e., 300) of Oconee spent fuel assemblies authorized for receipt for storage at McGuire Nuclear Station. The licensee states that it intends to deliver all spent fuel, including that shipped to McGuire Nuclear Station, to the Department of Energy for disposal pursuant to contract, and that it has no plans for other transfer of Oconee spent fuel at McGuire. Accordingly, we conclude that the proposed amendments do not involve any cumulative adverse impacts.

E. Additional Non-Radiological Effects

In addition to the radiological and non-radiological effects associated with transportation as discussed above, the licensee states that certain minor

modifications to the Oconee Nuclear Station are necessary to accommodate the additional handling tools and larger envelope of the multielement cask. These modifications include: (1) enlarging a grating opening in the decontamination pit, (2) adding grating at the bottom of the decontamination pit, (3) adding permanent lighting in the decontamination pit, (4) purchasing a new crane hook adapter, (5) fabricating and mounting a new spent fuel handling tool/crane hook adapter storage bracket in the transfer canal area, and (6) fabricating and mounting a storage stand for the cask primary lift beam on one wall of the decontamination pit. The Commission agrees that these are relatively simple modifications which do not (1) adversely affect any major structural components or use of the facility, or (2) create any adverse impact upon the environment.

#### F. Conclusion

The environmental impacts from use of the multielement cask are accounted for by the values contained in Table S-4 of 10 CFR 51.52, and, in accordance therewith, are small. Additionally, no new transportation routes are involved with the proposed amendments and the multielement casks have been certified to applicable requirements of 10 CFR Part 71. As a result of these considerations, transportation using the multielement cask as would be authorized by the proposed amendments will not result in adverse environmental impacts significantly affecting the human environment. Handling control procedures and analyses demonstrate that there is little likelihood that the cask could enter the spent fuel pool if dropped from the handling crane, or that it would cause significant structural damage or damage to any safety-related equipment. The cask and its fuel contents would remain intact if dropped during handling and the radiological consequences, therefore, would be no more severe than those previously evaluated by the Commission and

found acceptable in the FES. Use of the multielement cask is estimated to result in a reduction in occupational exposure to workers because it involves less handling and fewer shipments than the single element casks. The proposed amendments involve no adverse cumulative impacts. Minor modifications at Oconee Nuclear Station to accommodate the larger cask will not create any adverse impact to the environment. The proposed amendments do not otherwise involve significant non-radiological effects.

Therefore, we conclude that the proposed amendments will not result in significant adverse environmental impacts.

Alternative to the Proposed Actions: Since we have concluded that adverse environmental effects of the proposed action are not significant, any alternatives to the actions proposed would not result in substantial improvement in the quality of the environment and, therefore, need not be evaluated. The principal alternative would be to deny the requested amendments. That alternative, in effect, is the same as the "no action" alternative. Neither alternative would reduce environmental impacts of plant operation but would result in increased occupational exposure and reduced operational flexibility associated with reserve storage capacity in the Oconee spent fuel pool.

Alternative Use of Resources: This action does not involve the use of resources not previously considered in connection with the U. S. Nuclear Regulatory Commission's Final Environmental Statement dated March 1972 relative to this facility.

Agencies and Persons Consulted: The Commission staff reviewed the licensee's request of November 19, 1985 supplemented on June 16, 1986, February 18, 1987 and June 5, 1987, and did not consult other agencies or persons.

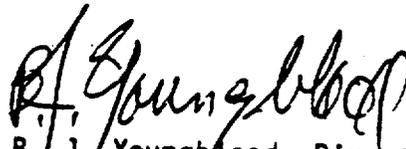
Finding of No Significant Impact: The Commission has determined not to prepare an environmental impact statement for the proposed license amendments.

Based upon this environmental assessment, the Commission, staff concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for amendments dated November 19, 1985, and its supplements dated June 16, 1986, February 18, 1987 and June 5, 1987. Also, see the Commission's approval for the McGuire Nuclear Station, amendments dated August 29, 1986 and environmental assessment (51 FR 30593). These documents are 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, 501 West Southbroad Street, Walhalla, South Carolina 29691.

Dated at Bethesda, Maryland, this 30th day of July 1987.

FOR THE NUCLEAR REGULATORY COMMISSION



B. J. Youngblood, Director  
Project Directorate II-3  
Division of Reactor Projects-I/II