Docket Nos.: 50-369
50-370

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

Aug 22, 1986

Dear Mr. Tucker:

Enclosed for your information is a copy of an "Environmental Assessment and Finding of No Significant Impact" related to your March 20, 1986, letter requesting amendments to the operating licenses for McGuire Nuclear Station, Units 1 and 2. The assessment has been forwarded to the Office of Federal Register for publication.

Sincerely,

/s/

Darl Hood, Project Manager
PWR Project Directorate #4
Division of PWR Licensing-A

Enclosure:
As stated

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DOCKET NOS. 50-369
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MEMORANDUM FOR: Rules and Procedures Branch
Division of Rules and Records
Office of Administration

FROM: Office of Nuclear Reactor Regulation

SUBJECT: McGuire Nuclear Station, Units 1 & 2 (DUKE POWER COMPANY)

One signed original of the *Federal Register* Notice identified below is enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (5) of the Notice are enclosed for your use.

- ☐ Notice of Receipt of Application for Construction Permit(s) and Operating License(s).
- ☐ Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for Submission of Views on Antitrust Matters.
- ☐ Notice of Consideration of Issuance of Amendment to Facility Operating License.
- ☐ Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
- ☐ Notice of Availability of NRC Draft/Final Environmental Statement.
- ☐ Notice of Limited Work Authorization.
- ☐ Notice of Availability of Safety Evaluation Report.
- ☐ Notice of Issuance of Construction Permit(s).
- ☐ Notice of Issuance of Facility Operating License(s) or Amendment(s).
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- ☐ Notice of Granting Exemption.
- ☒ Environmental Assessment.
- ☐ Notice of Preparation of Environmental Assessment.
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Office of Nuclear Reactor Regulation

Enclosure:
As stated

Contact: Marilee Duncan
Phone: 28928

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Mr. H. B. Tucker
Duke Power Company

McGuire Nuclear Station

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DUKE POWER COMPANY

DOCKET NOS. 50-369 AND 50-370

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of amendments to the Duke Power Company (the licensee) for the McGuire Nuclear Station, Units 1 and 2, located in Mecklenburg County, North Carolina.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action: The proposed amendments would expand subparagraph 2.K.e of Facility Operating License NPF-9 for Unit 1 and corresponding subparagraph 2.J.e of Facility Operating License NPF-17 for Unit 2 to authorize use of Transnuclear, Inc. multielement spent fuel shipping cask, Model Numbers TN-8 and TN-8L, for receipt of irradiated Oconee fuel. These subparagraphs of the licenses presently limit such receipt of Oconee spent fuel at McGuire to use of the NFS-4 (NAC-1) and NLI-1/2 casks, which are single-element casks. The new authorization, therefore, would be in addition to existing authorized casks and would otherwise be subject to all previous requirements of license paragraphs 2.K. (Unit 1) and 2.J. (Unit 2). This change was requested in the licensee's application for amendments dated March 20, 1986. Additional information in support of the requested change was provided by the licensee's letters dated May 23, June 4, July 10, and August 5, 1986.

The Need for the Proposed Action: By letter dated March 20, 1986, the licensee notes that in order to maintain acceptable reserve spent fuel storage capacity (needed for potential full core off-loading, reload batch and upender access) in the shared Oconee Units 1 and 2 spent fuel pool, it is necessary to use a multi-element spent fuel shipping cask. The licensee notes that in addition to maintaining the necessary shipment rate, multielement 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.

Environmental Impacts of the Proposed Action:

A. Background

Pursuant to the Decision dated August 10, 1981, of the Atomic Safety and Licensing Appeal Board [ALAB-651, 14 NRC 370] and the licensee's letters of application dated March 9, 1978, and September 15, 1981, the Commission issued on October 27, 1981, Amendment No. 8 to Facility Operating License NPF-9. (The licensee's application was originally filed as a request for amendment to Special Nuclear Materials License SNM-1773. Subsequent to that request, NPF-9, which incorporated the authorities and requirements of SNM-1773, was issued.) Amendment No. 8 to NPF-9 consisted of license conditions and Technical Specification changes to authorize the licensee to receive, possess and store at McGuire Unit 1 300 irradiated fuel assemblies generated at the Oconee Nuclear Station. One of the license conditions, paragraph 2.K.e, stated that "Receipt of irradiated Oconee fuel shall be limited by the use of NFS-4 (NAC-1) or NLI-1/2 spent fuel casks." In connection with issuance of that amendment which was based upon use of these single-element casks, the Commission issued an Environmental Impact Appraisal (EIA) in December 1978 which provided an analysis of radiological and non-radiological impacts of the various activities associated with

the proposal. Those activities included the operation of the McGuire spent fuel storage facility, the motor carrier transportation of 300 spent fuel assemblies (including the possible sabotage of spent fuel in transit and the possible consequences of a severe transportation accident), and accidents during the handling of the transported fuel assemblies at destination. The EIA concluded that there would be no environmental impact significantly affecting the human environment attributable to the proposed action and that an environmental impact statement, therefore, was not warranted. Accordingly, a Negative Declaration was published in the Federal Register on December 29, 1978 (43 FR 61057).

By Amendment No. 25 to Facility Operating License NPF-17, dated July 26, 1985, the Commission granted to the licensee, license authority to receive, possess, and store at McGuire Unit 2 irradiated Oconee fuel assemblies under the same conditions as had earlier been specified for Unit 1, including use of the specified single-element casks. Amendment No. 25 followed the issuance of "Environmental Assessment and Finding of No Significant Impact," 50 FR 25804, on June 21, 1985.

B. Transportation

TN-8 and TN-8L are multielement 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 renewed 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 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 an attitude 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 30 foot free-fall onto an unyielding surface, in an attitude that produces maximum damage. Puncture is represented by a 40 inch free-fall onto a 6 inch diameter pin, mounted on an unyielding surface, at an attitude to produce maximum damage. Fire resistance requirements were that the cask withstand an exposure to an all-enveloping thermal radiating environment of at least 1475°F for 30 minutes and no external cooling for 3 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 same transportation routes previously approved by the Commission (see McGuire Unit 1, Amendment 8, and McGuire Unit 2, Amendment 25), in connection with use of the single-element casks would continue to be used when transporting irradiated fuel from the Oconee pools to the McGuire pools using the multielement casks. 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 August 5, 1986, the licensee has addressed the proposed amendments in accordance with paragraphs (a) and (c) of 10 CFR 51.52, "Environmental effects of transportation of fuel and waste - Table S-4." 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). The fuel that would be transported from Oconee would be sintered uranium dioxide pellets with a maximum uranium - 235 initial enrichment of 3.2 percent, encapsulated in zircaloy rods and, therefore, is of the type described by subparagraph (a)(2). The fuel assemblies will have average irradiation levels less than 33,000 MWD/MTU and are expected to be retained within the Oconee spent fuel pool at least 5 years prior to shipment, which is consistent with the conditions of subparagraph (a)(3). 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.

The expected heat content of the fully loaded cask in transit will be less than 10,200 BTU/hr, which represents less environmental impact due to 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 due to 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 4 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 2 millirem/hour; at this limit, the 3½ hour trip 52 times a year with 2 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 during the 3½ hour trip 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 due to 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 8,944 miles per year for the proposed action 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.

C. Handling

In support of its request for authorization to use TN-8 and TN-8L multielement 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 McGuire 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 already in the Technical Specifications, as well as in 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 specifications (and procedures) require the cask to follow a prescribed path (see TS Figure 3.9-1) 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 March 1985 the staff completed a review of the McGuire Units 1 and 2 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 McGuire 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 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 capacity 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 McGuire 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 multi-element casks remains very unlikely and is not increased by the proposed license change.

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 McGuire site. These results provide assurance that the fuel and cask would remain intact in the event of a dropped cask during handling at the McGuire 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 which was evaluated by the Commission as reported in the accident analyses of Chapter 7 to "Final Environmental Statement Related to Operation of William B. McGuire Nuclear Station, Units 1 and 2" (FES), dated April 1976.

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 FES conclusions, and will not result in a significant adverse impact on the quality of the human environment.

D. Occupational Radiological Exposure

The licensee notes that one advantage of the multielement 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 millirem for each individual shipment (i.e., 645 person millirem for three individual shipments). If, instead, the three spent fuel assemblies had been shipped using the TN-8 or TN-8L multielement cask, the licensee estimates that the dose to all workers would have been no more than 615 person millirem. Therefore, use of the multielement cask is estimated to result in a reduction in occupational exposure of at least 10 person millirem for each spent fuel assembly shipped.

E. 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.

F. Additional Non-Radiological Effects

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

G. Conclusion

The environmental impacts resulting from use of the multi-element 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 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 singleelement casks. The proposed amendments involve no adverse cumulative impacts. Minor modifications at the McGuire 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 the 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 Nuclear Regulatory Commission's Final Environmental Statement dated April 1976 or its addendum dated January 1981 related to this facility.

Agencies and Persons Consulted: The NRC staff reviewed the licensee's request of March 20, 1986 supplemented May 23, June 4, July 10, and August 5, 1986, 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, we conclude 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 March 20, 1986, and its supplements dated May 23, June 4, July 10 and August 5, 1986. These submissions, as well as the staff's prior

environmental analysis pertaining to transshipment of Oconee spent fuel to McGuire, are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C., and at the Atkins Library, University of North Carolina, Charlotte (UNCC Station), North Carolina 28242.

Dated at Bethesda, Maryland, this 22nd day of August 1986.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Paul W. O'Connor, Acting Director
PWR Project Directorate #4
Division of PWR Licensing-A, NRR

*See Previous Concurrences

PWR#4:DPWR-A	PWR#4:DPWR-A	PWR#4:DPWR-A	OGC/BETHESDA
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08/ 20/86	08/ 20 /86	08/ 20 /86	08/ 21/86