

Docket Nos.: 50-369  
and 50-370

December 16, 1986

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 for OL Extensions

Enclosed is a copy of the Environmental Assessment relating to your December 16, 1985, and November 24, 1986, application for license amendments. The proposed amendments would change the expiration date for the McGuire Units 1 and 2 Operating Licenses, to be based upon a 40 year term beginning with issuance of the operating licenses, rather than the construction permits. The new expiration dates would be June 12, 2021, for Unit 1 and March 3, 2023, for Unit 2, rather than February 28, 2013, for both units.

A copy of a Notice of Issuance of Environmental Assessment and Finding of No Significant Impact, which will be published in the Federal Register, is also enclosed.

Sincerely, 151

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

Enclosures: As stated

cc: See next page

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McGuire Nuclear Station

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UNITED STATES NUCLEAR REGULATORY COMMISSIONDUKE POWER COMPANYDOCKET NOS. 50-369 AND 50-370NOTICE OF ISSUANCE OF ENVIRONMENTAL ASSESSMENT AND FINDING OFNO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering the issuance of proposed amendments which would change the expiration date for the McGuire Nuclear Station, Unit 1, Operating License, NPF-9 from February 28, 2013, to June 12, 2021, and change the expiration date for the McGuire Nuclear Station Unit 2, Operating License, NPF-17, from February 28, 2013 to March 3, 2023.

Identification of Proposed Action

The currently licensed term for McGuire, Units 1 and 2, is 40 years commencing with issuance of the construction permits (February 28, 1973). Accounting for the time that was required for plant construction, this represents an effective operating license term of 31-3/4 years for Unit 1 and 30 years for Unit 2. The licensee's application dated December 16, 1985, requests a 40-year operating license term for McGuire, Units 1 and 2. Additional information in support of the request is provided by the licensee's letter of November 24, 1986.

Summary of Environmental Assessment

The Commission has reviewed the potential environmental impact of the proposed change and has issued "Environmental Assessment by the Office of Nuclear Reactor Regulation Relating to the Change in Expiration Dates of Facility Operating License Nos. NPF-9 and NPF-17, Duke Power Company, McGuire Nuclear Station, Unit Nos. 1 and 2." This evaluation considered the previous environmental studies, including the "Final Environmental Statement Related to Operation of William B. McGuire Nuclear Station, Units 1 and 2" (FES) April 1976, its addendum of January 1981, and more recent Commission policy.

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Radiological Impacts:

The population beyond a five mile radius of McGuire Units 1 and 2, based on the 1980 census, is lower than the population which was predicted in the FES based on the 1970 census. The population within the five-mile radius of the McGuire Station is greater than that predicted in the FES. The exclusion area and nearest population center are not changed and local land usage remains rural. The site will continue to meet the requirements of 10 CFR Part 100. Station radiological effluents to unrestricted areas during normal operation have been well within Commission regulations regarding as-low-as-is-reasonably-achievable (ALARA) limits, and are indicative of future releases. In addition, the proposed additional years of reactor operation do not increase the annual public risk from reactor operation. Thus, the higher-than-projected population growth rate within five miles of the site does not change the environmental impact findings in the FES because its effects are offset by favorable radiological exposure from plant releases during normal operation and by low public risk from accidents. With regard to station personnel, the licensee complies with Commission guidance and requirements for keeping radiation exposures ALARA for occupational exposures and would continue to comply with these requirements during any additional years of facility operation and also apply advanced technology when available and appropriate. Accordingly, radiological impacts on man, both onsite and offsite, are not significantly more severe than previously estimated in the FES and our previous cost-benefit conclusions remain valid.

The net annualized environmental impacts attributable to the uranium fuel cycle, which form the basis for Table S3 of 10 CFR 51, remain essentially unchanged from those addressed in the SER addendum. The environmental impacts attributable to transportation of fuel and waste to and from the McGuire Nuclear

Station, with respect to normal conditions of transport and possible accidents in transport, would continue to be as set forth in Summary Table S-4 of 10 CFR 51.52, and the values in Table S-4 would continue to represent the contribution of transportation to the environmental costs associated with the reactor.

Non-Radiological Impacts:

The licensee has conducted a demonstration project in accordance with Section 316(a) of the Clean Water Act which demonstrates that thermal discharges from the Station are such that the water quality and the indigenous biota of Lake Norman are protected. The demonstration project has been approved by the State of North Carolina, the National Pollutant Discharge Elimination System (NPDES) permitting authority.

The Commission's review of the requested extension concluded that all potential impacts have been identified, described and evaluated in its previously-issued environmental impact statements and/or appraisals and reviews by the NPDES permitting authority under the Clean Water Act. All operational non-radiological impacts on aquatic biological resources have been assessed by the Commission on bases other than a life-of-plant basis; hence, the requested extensions will not alter previous Commission findings and conclusions. The NPDES permit provides additional environmental protection.

Finding of No Significant Impact

The Commission has reviewed the proposed change to the expiration dates of the McGuire Units 1 and 2 Facility Operating Licenses relative to the requirements set forth in 10 CFR Part 51. Based upon the environmental assessment, the Commission concluded that there are no significant adverse radiological or non-radiological impacts associated with the proposed action and that the proposed license amendments will not have a significant adverse effect on the quality of

the human environment. Therefore, the Commission has determined, pursuant to 10 CFR 51.31, not to prepare an environmental impact statement for the proposed amendments.

For further details with respect to this action, see (1) the application for amendments dated December 16, 1985, and supplemental letter of November 24, 1986 (2) the Final Environmental Statement Related to Operation of William B. McGuire Nuclear Station Units 1 and 2, April 1976, with its addendum dated January 1981, (3) licensee's letter of August 23, 1985 with report pursuant to Section 316(a) of the Clean Water Act, and (4) the Environmental Assessment dated December 16, 1986. These documents are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W. Washington, D. C., 20555 and at the Atkins Library, University of North Carolina, Charlotte (UNCC Station), North Carolina 28223.

Dated at Bethesda, Maryland, this 16<sup>th</sup> day of December 1986.

FOR THE NUCLEAR REGULATORY COMMISSION

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B. J. Youngblood, Director  
PWR Project Directorate #4  
Division of PWR Licensing-A

\* SEE PREVIOUS CONCURRENCES

PWR#4/DPWR-A  
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\*JMilhoan  
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PAEB/DPWR-A  
\*RBallard  
12/08/86

PWR#4/DPWR-A  
\*BJYoungblood  
12/09/86

ENVIRONMENTAL ASSESSMENT  
BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATING TO THE CHANGE IN EXPIRATION DATES OF  
FACILITY OPERATING LICENSE NOS. NPF-9 AND NPF-17  
DUKE POWER COMPANY  
MCGUIRE NUCLEAR STATION UNIT NOS. 1 AND 2  
DOCKET NOS. 50-369 and 50-370

Date: December 16, 1986

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## 1.0 INTRODUCTION

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. The proposed amendments would change the expiration date in paragraph 2.L of Facility Operating License NPF-9 for Unit 1 from midnight on February 28, 2013, to midnight on June 12, 2021. Similarly, the expiration date in paragraph 2.K of Facility Operating License NPF-17 for Unit 2 would be changed from midnight on February 28, 2013, to midnight on March 3, 2023.

The currently licensed term for McGuire Nuclear Station, Units 1 and 2 is 40 years commencing with the issuance of the construction permit (February 28, 1973). Accounting for the time that was required for plant construction, this represents an effective operating license term of about 32 years for Unit 1 and about 30 years for Unit 2. The licensee's application dated December 16, 1985, requests a 40-year operating license term for McGuire Nuclear Station, Units 1 and 2.

## 2.0 THE NEED FOR THE PROPOSED ACTION

The granting of the proposed license amendments would allow the licensee to operate McGuire Nuclear Station, Units 1 and 2, for an additional 8½ and 10 years, respectively, beyond the currently approved dates.

## 3.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

In April 1976, the Commission issued the "Final Environmental Statement Related to Operation of William B. McGuire Nuclear Station, Units 1 and 2" (FES). An addendum to the FES was issued in January 1981. These documents provide an evaluation of the environmental impact associated with operation of McGuire Nuclear Station, Units 1 and 2. The Commission has reviewed these documents to determine if any significant environmental impacts, other than those previously considered, would be associated with the proposed license extensions.

### 3.1 RADIOLOGICAL IMPACTS

The Commission has examined the FES to determine whether the environmental impacts would be greater with the extended operating licenses. Updated population estimates for the area surrounding McGuire were compared to population estimates referenced in the FES and FSAR. The Commission also examined the effects of updated population estimates upon the previous determination of exclusion area, low population zone (LPZ) and population center distance, in accordance with 10 CFR 100.11.

The FES estimates for the population within a 50-mile radius of McGuire were based on the 1970 census and were projected to the year 2015. Recalculation of the population estimates based on the 1980 census, and on projections made by the United States Department of Commerce, Bureau of Economic Analysis (References 1 and 2), to the years 2020 and 2030 result in the following updated projections:

Population Projections Within 50-mile Radius  
of McGuire Nuclear Station

<u>Year</u>		<u>Population Total</u>	<u>Population Annual<sup>3</sup> Average Growth (%/yr.)</u>
2015 (1970 census)	1	2.651 Million	1.46
2020 (1970 census)	2	2.818 Million	1.44
2020 (1980 census)		2.188 Million	0.925
2030 (1980 census)		2.279 Million	0.839

1. As reported in McGuire FES.
2. From McGuire FSAR Figure 2.1.3-2
3. Calculated based on 1970 population of 1.38 million within the 0-50 mile radius of McGuire as referenced in the McGuire FES.

The McGuire FES cost-benefit analyses used estimated population doses calculated on the basis of 1970 population statistics to evaluate McGuire radiological impacts. As shown above, use of updated (1980) census information results in population growth projections that are lower than those projected in the FES for the area within a 50-mile radius of the McGuire Nuclear Station. These lower population growth rates tend to improve the already favorable cost-benefit conclusions established in the FES.

The LPZ around McGuire extends to a 5.5-mile radius from the station. Estimates for the populations within a 5-mile radius and a 10-mile radius of McGuire were developed by the licensee based on information previously presented in the McGuire FES and FSAR and updated based on 1980 census data and projections by the United States Department of Commerce (References 1 and 2). These estimates are summarized as follows:

Population Projections Within 5-Mile Radius and 10-mile Radius  
of McGuire Nuclear Station

<u>Year</u>	<u>5-Mile Radius</u>		<u>10-Mile Radius</u>	
	<u>Population Total</u>	<u>Population Annual Average Growth (%/Yr)<sup>3</sup></u>	<u>Population Total</u>	<u>Population Annual Average Growth (%/Yr)</u>
2015 (1970 Cen.) <sup>1</sup>	6,813	1.51	83,095	1.67
2020 (1970 Cen.) <sup>2</sup>	7,399	1.53	88,721	1.64
2020 (1980 Cen.)	10,739	2.29	71,262	1.19
2030 (1980 Cen.)	11,103	1.96	73,982	1.06

1. As reported in McGuire FES.
2. From McGuire FSAR Table 2.1.3-1
3. Calculated based on 1970 population of 3465 within the 0-5 mile radius of McGuire as referenced in the McGuire FES.
4. Calculated based on 1970 population of 39,362 within the 0-10 mile radius of McGuire as referenced in the McGuire FES.

These updated population growth projections based on 1980 census data for the area within 5 miles of McGuire are approximately 50 percent higher than previously projected in the FES or FSAR, which used 1970 census information. The corresponding projections for the area within 10 miles are lower than those in the FES or FSAR by about 15 percent. The exclusion area surrounding the reactors (in which Duke Power Company, through ownership of the property and through agreements with and cooperation of the Mecklenburg County Police and North Carolina Highway Patrol and Lake Norman Marine Commission, exercises appropriate control, including exclusion or removal of personnel and property) remains unchanged from that described in SER Section 2.1. The nearest population center distance, defined as the distance from the reactor to the nearest boundary of a densely populated center having more than 25,000 residents, continues to be greater than one and one-third the distance from the reactor to the outer boundary of the LPZ. The nearest population center continues to be Charlotte, NC and is projected to remain so throughout the proposed extended license period for McGuire. Therefore, the nearest population center remains the same as that described in McGuire SER Section 2.1. Additionally, the licensee's updated population projections for the year 2020 for all the sectors which include Charlotte (i.e., S, SSE, SE at 10 to 20 miles from the McGuire site) and all the sectors just on the McGuire side of Charlotte (i.e., S, SSE, SE at 5 to 10 miles from the McGuire site) are lower than those projected based on 1970 census data and presented in McGuire FSAR Figures 2.1.3-8 and 2.1.3-14.

The higher-than-projected population growth rates experienced in this relatively small area within 5 miles of McGuire are offset by favorable radiological exposure from plant releases during normal operation and by low public risk from accidents (both discussed below), and therefore, do not alter the favorable cost-benefit conclusions reached in the FES. The increase in population within 5 miles of the station is primarily due to residential lakeshore development, upgrading of secondary roads, and the completion of Interstate 77. The land usage in the local area remains rural. Although there has been higher projected growth than previous projections in the FES and FSAR, the upgrading of secondary roads and the completion of Interstate 77 attendant with the population growth in the area assures that there continues to be a reasonable assurance that appropriate measures can be taken on behalf of the population within the LPZ in the event of an accident. The population density around McGuire remains about half the average for U.S. nuclear power plants. Therefore, the conclusion reached in FSAR Section 2.1.3.3 and the FES, that McGuire meets the requirements of 10 CFR 100 remains unchanged.

The McGuire FES includes an assessment of the public risks from reactor accidents per year of operation. The Commission has also assessed the public risks from reactor accidents per year of operation at other reactors of comparable design and power level (and larger). In all cases, including McGuire, the estimated reactor accident risks of early and latent cancer fatality per year of operation have been small compared to the background accident and cancer fatality risks to which the public is exposed, and did not increase with longer periods of operation. Therefore, we conclude that the proposed additional years of operation will not increase the annual public risk from reactor accidents.

The principal factors associated with an additional period of operation which could potentially change the probability or consequence of an accident would be due to aging of electric equipment important to safety, and changes in the fracture toughness properties of reactor vessel beltline materials due to neutron irradiation. The Commission has reviewed fracture toughness requirements for protection against pressurized thermal shock events and has determined that each McGuire unit can be operated for 40 calendar years without reaching pressurized thermal shock screening criterion specified in 10 CFR 50.61. The Commission also finds that the licensee has established an environmental qualification program for electric equipment important to safety in accordance with 10 CFR 50.49, and that this program has given appropriate consideration to all significant types of degradation, including aging, which can have an effect on the functional capability of equipment. Under the licensee's environmental qualification program, equipment important to safety has either been determined to be qualified for at least 40 years of operation, or is designated for periodic replacement or refurbishment prior to the end of its predetermined life.

In addition to the environmental qualification program, numerous other programs exist at nuclear power plants to assure that the probability and consequence of any accident remains consistently small. Examples of such programs include those of Technical Specifications which limit conditions for operation and require periodic surveillances; operating and emergency procedures; administrative procedures; inservice inspection requirements; periodic maintenance; quality control and quality assurance programs; personnel qualification and training programs; and other programs associated with continued conformance to national codes and standards. Such programs remain in effect throughout the duration of the operating license, including any extended operation authorized by the Commission. Accordingly, the Commission concludes that the proposed extension does not increase the probability or the severity of any accident. Although there does exist an integral exposure to risk by virtue of the additional years of plant operation and increased population within 5 miles of the site, the additional exposure to risk is not significant because the probability and consequences of accidents remain small. Accordingly, the proposed extension would not cause a significant increase in the public risks from reactor accidents and would not change any conclusions by the Commission in the FES.

The Commission has evaluated the radiological environmental effects associated with normal operation of the facility. This evaluation was conducted to assure that the licensee's "as-low-as-is-reasonably-achievable" (ALARA) measures and dose projections are applicable for the additional years of plant service and are in accordance with 10 CFR Part 20 and the guidance of Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be as Low as is Reasonably Achievable".

### 3.1.1 ENVIRONMENTAL IMPACTS - GENERAL PUBLIC

The Commission calculated dose commitments to the human population residing around nuclear power reactors to assess the impact on people from radioactive material released from these reactors during normal operation. The annual dose commitment

is the calculated dose that would be received over a 50-year period following the intake of radioactivity for one year under the conditions that would exist 15 years after the plant began operation.

The 15 year period is chosen as representing the midpoint of 30 year plant operations cycle and was incorporated into the dose models by allowing for buildup of long-lived radionuclides in the soil. Estimated doses are affected significantly only for radionuclides that have half-lives greater than a few years and are ingested by humans. For a plant licensed for 40 years, increasing the buildup period from 15 to 20 years would increase the total dose from long-lived radionuclides via the ingestion pathways about 33 percent. The effect on dose from shorter-lived radionuclides would be nil; even Cobalt-60 with its 5 year half-life reaches equilibrium in 15 years. Annual doses are dominated by short-lived nuclides such as Iodine-131 so the total change caused by the increase in operating life is negligible compared to the already low doses.

In Appendix D of the McGuire SER dated March 1978, the Commission provided an assessment of McGuire with respect to the design objectives of Appendix I of 10 CFR 50. Table 4 of Appendix D indicates that the estimated doses via the ingestion pathways are well below the regulatory design objectives. For example, the ingestion dose to the thyroid from Units 1 and 2 is 0.58 mrem/yr/site compared to a design objective of 5 mrem/yr/site.

The licensee calculates annual offsite doses based upon actual effluent releases during each year of operation. These calculations are based upon methodology and parameters in the licensee's "Offsite Dose Calculational Manual" which was previously reviewed and accepted by the Commission. The doses for 1985 from station liquid radioactive effluents, and from gaseous radioactive effluents were less than 3% and 27%, respectively, of the 10 CFR 50 Appendix I limits. Results for these effluents for the first seven months of 1986 were less than 4% and 10%, respectively, of the Appendix I limits (corresponding to extrapolated year-end dose percentages of less than 7% and 17%, respectively). The licensee states that doses for earlier years of operation are comparable in that they, too, are far below Appendix I dose limits. The licensee also expects the annual doses calculated to date to remain typical of plant operations through the year 2023. Thus, an increase of even as much as 33 percent in these pathways would result in a dose that remains within Appendix I dose limits and would not be significant.

### 3.1.2 ENVIRONMENTAL IMPACTS - OCCUPATIONAL EXPOSURES

The Commission has evaluated the licensee's occupational dose assessment for the years 2013 to 2023 (the additional years during which Unit 1 and/or Unit 2 would operate), and compared it with current McGuire and overall industry occupational dose experience.

The average dose over the recent three year period covering 1983-1985 has been 640 person-rem per year for both McGuire units (320 person-rem per unit). By comparison, the average annual dose per reactor for other U.S. pressurized water reactors has been about 700 person-rem per unit.

The licensee estimates that an average annual dose of 700 person-rem for both units will be incurred for each additional year of operation. The total occupational dose expected over the period of the operating license extension is 7000 person-rem, and is based on 10 additional years of operation and 15 additional refuelings during this period with no major unanticipated maintenance.

The licensee also indicated that it will utilize criteria established in its current formal ALARA program in addition to any improvements that are made throughout the duration of the operating license. The program is constantly evolving as techniques are perfected, technology is improved, and the work force becomes more educated in radiation protection practices. Items such as robotics, remote surveillance, remote tooling, decontamination, and improved computer resources, are presently anticipated to be significant factors in the future in further achieving ALARA doses.

As a supplement to its corporate ALARA program, for which the licensee's Nuclear Production Department has responsibility, the Design Engineering Department has developed an ALARA program applicable to the design process. This program consists of periodic training, the Design Engineering Department ALARA Guide, and peer review of designs. Following initial design ALARA training, refresher training is required for appropriate Design Engineering personnel every two years. State-of-the-art ALARA design techniques, emphasizing crud and modification dose reductions, are introduced at the training sessions. In addition, the ALARA Guide is distributed to appropriate personnel for use as a reference during the design process. This guide is revised to reflect new design ALARA techniques and concepts. Finally, designs are subject to review by personnel responsible for ALARA training and guide development. Also, a methodology that considers personnel dose received during modification implementation at the design stage, is being evaluated by the licensee. The Design Engineering Department's ALARA program has been audited by the licensee and by external organizations such as the Institute of Nuclear Power Operations (INPO), with favorable results.

Planned or recently completed station modifications that are expected to contribute to reduced occupational exposure over the remainder of station life include removal of the Upper Head Injection System (see Unit 1 Amendment 57 and Unit 2 Amendment 38) and bypass manifolds associated with resistance temperature detection instrumentation (presently under Commission review). To prolong the life of the McGuire steam generators and reduce occupational exposures, the licensee has obtained Commission approval (by Amendments 59 and 40) of technical specifications revisions to the plugging criteria for tube defects located within the tube sheet region and has developed a shot-peening process (implemented on Unit 1 and planned on Unit 2) to reduce stresses on the primary water surface of the tubes.

Spent fuel is stored in the reracked spent fuel pool in lieu of shipment offsite as stated in the FES. Such storage was previously evaluated by the Commission for Amendments 35 and 16 and was found to result in insignificant adverse environmental consequences. Any further expansion of on-site spent fuel storage capacity would be further evaluated for radiological environmental effects by the Commission.

The Commission agrees that it is reasonable to anticipate still further improvements affecting occupational exposures throughout the duration of the operating licenses. In view of such improvements and the favorable results demonstrated by the licensee's ALARA program to date, the Commission agrees that occupational radiation exposures will be maintained ALARA and in compliance with 10 CFR Part 20 requirements. Therefore, the integral exposure which would occur throughout the additional years during which Unit 1 and Unit 2 would be permitted to operate by the proposed amendments would be small.

Accordingly, the Commission concludes that with respect to radiological impacts associated with occupational exposures, there would not be any significant changes to the FES that would be necessary in order to consider 40 years of operation.

### 3.1.3 ENVIRONMENTAL IMPACTS - URANIUM FUEL CYCLE

The impacts of the uranium fuel cycle as indicated in addendum to the FES were based upon Table S-3 of 10 CFR 51, Table of Uranium Fuel Cycle Environmental Data. Table S-3 is a summary of environmental impacts attributable to the uranium fuel cycle, normalized to the annual fuel requirement, based on 30 years of operation of a model light water reactor (LWR). The fuel requirements for the model LWR were assumed to be one initial core load and 29 annual refuelings (approximately 1/3 core per refueling). In considering the annual fuel requirement for 40 years for the model LWR, fuel use is averaged over a 40-year operating life (one initial core and 39 refuelings of approximately 1/3 core) and results in a

slight reduction compared to the annual fuel requirement averaged for a 30-year operating life. The net result is an approximate 1.5% reduction in the annual fuel requirements for the model LWR, due to averaging out of the initial core load over 40 years, rather than 30 years. Total fuel use for McGuire (1112 metric tons of U-235) would be expected to increase about 5 percent over the amount (1062 metric tons of U-235) originally considered in the FES addendum. This entails a longer production run for the fuel cycle for the McGuire units and, consequently, increased environmental costs related to mining, enrichment, and other fuel cycle impacts. The net annualized effects which form the basis for Table S-3 impacts, remain essentially unchanged from those discussed in the addendum to the FES.

The above evaluation of fuel use takes into account the fact that the licensee has been in the process of converting from Westinghouse Standard Design Fuel to Optimized Fuel Assemblies (OFA) on both McGuire units. This transaction is essentially complete on Unit 1 (with only nine fuel assemblies of the standard design remaining) and has one more significant conversion cycle to complete Unit 2. This conversion has been previously evaluated by the Commission and found to have no significant environmental impact.

The Commission concludes that with respect to radiological impacts associated with the uranium fuel cycle, there would not be any significant changes to the FES that would be necessary in order to consider 40 years of operation.

#### 3.1.4 ENVIRONMENTAL IMPACTS - TRANSPORTATION OF FUEL AND WASTE

The licensee is presently shipping about 10,000 ft<sup>3</sup> of solid rad-waste per McGuire unit per year, with year to year variations based on duration of outages. This is consistent with the quantities which had been projected in the FES. The licensee expects this annual volume to remain at about the present level for the life of the station.

The environmental impacts (both radiological and non-radiological) attributable to transportation of fuel and waste to and from the McGuire site, with respect to normal conditions of transport and possible accidents in transport, would continue to be in accordance with the impacts set forth in Table S-4 of 10 CFR 51.52. Table S-4 represents the contribution of such transportation to annual environmental costs including dose per reactor year to exposed transportation workers and to the general public (both onlookers and individuals located along the route), and the estimated numbers of such persons exposed each year. These annual environmental costs would not be changed by the extended period of operation. Although some integral risk with respect to normal conditions of transportation and possible accidents in transport would be attributed to the additional years of operation, the integral risk would not be significant because the annual risk for such transport is small.



The environmental impacts associated with the transshipment of Oconee spent fuel to the McGuire site for storage was previously evaluated by the Commission and found to be insignificant; these impacts would not be changed by the proposed extension because the current authorization to receive, possess and store such fuel at McGuire is limited to 300 fuel assemblies, and this limitation is not changed by the proposed action.

Accordingly, the Commission concludes that there would not be any significant changes to the FES with respect to the transportation of fuel and waste that would be necessary in order to consider 40 years of operation.

### 3.2 NON-RADIOLOGICAL IMPACTS

In accordance with the FES, the licensee has conducted an extensive aquatic monitoring program as detailed in the Environmental Report along with certain modifications. During this same time period, the licensee applied to the Environmental Protection Agency for a National Pollutant Discharge Elimination System (NPDES) permit. The state of North Carolina obtained NPDES permitting authority and Permit No. NCO04392 was issued for McGuire on March 28, 1978. Non-radiological discharges from McGuire would be regulated through the NPDES permitting system including the thermal monitoring as proposed in the McGuire FES. The state of North Carolina required, as part of the March 28, 1978 permit, that the licensee conduct a special demonstration project in accordance with Section 316(a) of the Clean Water Act to show that the thermal discharges would be such that the water quality and indigenous biota of Lake Norman would be protected. Duke completed that study in June 1985, and submitted it in August, 1985. The study was approved by North Carolina by letter dated October 18, 1985 and a copy was provided to the NRC by licensee's letter dated November 27, 1985.

The NPDES permit contains provisions to assure that all non-radiological discharges from McGuire will comply with applicable water quality standards. The permit also contains provisions requiring that it may be modified from time to time to assure that the discharges to state waters will not cause adverse environmental impacts for the life of the plant.

All potential impacts have been identified, described and evaluated in previously-issued environmental impact statements and/or appraisals by the Commission and reviews by the NPDES permitting authority under the Clean Water Act. All operational non-radiological impacts on aquatic biological resources have been assessed by the Commission on bases other than a life-of-plant basis; hence, the requested extensions will not alter previous Commission findings and conclusions.

### 4.0 ALTERNATIVE TO THE PROPOSED ACTION

The principal alternative to issuance of the proposed license extensions would be to deny the applications. This alternative is, in effect, the same as the "no-action" alternative. In either case, McGuire Nuclear Station, Units 1 and 2 would shutdown upon expiration of the present operating licenses at midnight on February 28, 2013.

The cost-benefit analysis in the McGuire FES included a comparison of various options for producing an equivalent electrical power capacity. Even considering significant changes in the economics of the alternatives, operation of McGuire Nuclear Station Unit 1 for an additional 8½ years and Unit 2 for an additional 10 years would only require incremental yearly costs. These costs would be substantially less than the purchase of replacement power or the installation of new electrical generating capacity. Moreover, the overall cost per year of the facility would decrease since the large initial capital outlay would be averaged over a greater number of years. Environmental impacts related to extending the operating life of the McGuire units, including the fuel cycle and transportation impacts, continue to remain small when compared to impacts related to alternative sources of power described in the McGuire FES. Extended operation of the plant maintains the economic benefits of low-cost power as no new construction costs are incurred.

#### 5.0 ALTERNATIVE USE OF RESOURCES

This action does not involve the use of resources not previously considered in connection with the "Final Environmental Statement Relating to Operation of William B. McGuire Nuclear Station Units 1 and 2" dated April 1976 or its addendum dated January 1981.

#### 6.0 AGENCIES AND PERSONS CONSULTED

The Commission reviewed the licensee's request and consulted with the North Carolina Department of Natural Resources and Community Development (NCDNR&CD). NCDNR&CD did not indicate a concern in granting the proposed extension and will extend the water quality requirements in the NPDES to cover the period of the extension. The Commission's review of the proposed action has been based upon the licensee's application of December 16, 1985 and supplemented by letter dated November 24, 1986; the McGuire FES dated April 1976 and its addendum of January 1981; the McGuire Environmental Report-Operating License stage; Appendix B of the McGuire Technical Specifications (Environmental Protection Plan); licensee's letter of August 23, 1985 with report pursuant to Section 316(a) of the Clean Water Act; Chapters 2 and 15 of the McGuire FSAR; and licensee's letter of November 27, 1985 with attached NPDES permit.

#### 7.0 BASIS AND CONCLUSION FOR NOT PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

The Commission has reviewed the proposed license amendments relative to the requirements set forth in 10 CFR Part 51. Based on this assessment, the Commission concludes that there are no significant radiological or non-radiological impacts associated with the proposed action and that the issuance of the proposed license amendments will have no significant impact on the quality of the human environment. Therefore, pursuant to 10 CFR 51.31, an environmental impact statement need not be prepared for this action.

## 8.0 REFERENCES

1. U.S. Department of Commerce, Bureau of Economic Analysis, Projection, Economic Activity in North Carolina, Series E Projection, April 1986.
2. U.S. Department of Commerce, Bureau of Economic Analysis, Projection, Economic Activity in South Carolina, Series E Projection, April 1986.

## 9.0 ACKNOWLEDGMENT

This environmental assessment was prepared by Darl Hood, PWR#4

Date: December 16, 1986