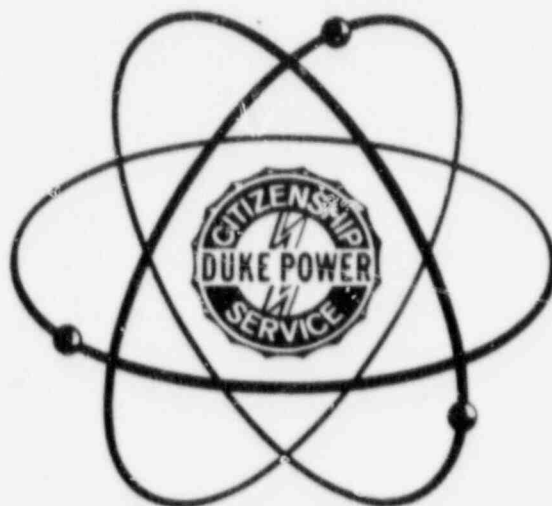


**INDEPENDENT SPENT FUEL  
STORAGE INSTALLATION**

**LICENSE APPLICATION**

**Duke Power Company**

**OCONEE NUCLEAR STATION**



APPENDIX A

BEFORE THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION

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IN THE MATTER OF  
DUKE POWER COMPANY  
OCONEE NUCLEAR STATION, UNITS 1, 2 AND 3  
INDEPENDENT SPENT FUEL STORAGE INSTALLATION

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LICENSE APPLICATION  
UNDER  
10 CFR PART 72

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## CHAPTER 1

### GENERAL AND FINANCIAL INFORMATION

#### (1) APPLICATION FOR LICENSE

Duke Power Company hereby makes application, pursuant to the provisions of 10 CFR Part 72 for the necessary license to construct, own, use and operate an Independent Spent Fuel Storage Installation (ISFSI) located at the site of Oconee Nuclear Station in Oconee County, South Carolina, and to be known as the "Oconee Nuclear Station, Independent Spent Fuel Storage Installation".

This application for the proposed ISFSI contains information pursuant to the provisions of 10 CFR Part 72 and has been prepared in accordance with the guidance provided by the "Proposed Revision 1 to Regulatory Guide 3.50, Guidance on Preparing a License Application to Store Spent Fuel and High-Level Radioactive Waste, September 1986, Division 3, Task CE 402-4". The application consists of the following three parts:

- (a) the license application which is set out herein;
- (b) the technical information and safety analysis report required by 10 CFR 72, which is set out in a separate document entitled, "Independent Spent Fuel Storage Installation, Safety Analysis Report, Duke Power Company, Oconee Nuclear Station", forwarded herewith and made a part of hereof; and
- (c) The environmental information required by Subpart A of 10 CFR 51, which is set out in a separate document entitled, "Independent Spent Fuel Storage Installation, Environmental Report, Duke Power Company, Oconee Nuclear Station", forwarded herewith and made a part hereof.

#### (2) NAME OF APPLICANT

Duke Power Company

#### (3) ADDRESS OF APPLICANT

Duke Power Company  
P.O. Box 33189  
422 South Church Street  
Charlotte, North Carolina 28242

#### (4) DESCRIPTION OF BUSINESS OF APPLICANT

Duke Power is the nation's seventh largest investor-owned electric utility. It is headquartered in Charlotte, North Carolina, near the center of its 20,000 square-mile service area in North Carolina and South Carolina with a population of 4.5 million.

In 1987, Duke Power's three nuclear stations, eight coal-fired plants and 26 hydroelectric facilities produced more than 69.9 billion kilowatt-hours of electricity for nearly 1.5 million customers. About 70 percent of sales were in North Carolina and 30 percent in South Carolina. Electric revenues for the year totaled \$3.7 billion.

Duke serves its retail customers through 100 district and branch offices. The Company also sells power to bulk users at wholesale and contractual rates.

(5) LEGAL STATUS AND ORGANIZATION

Duke Power Company is a corporation organized and existing under the laws of the State of North Carolina, and its principal office is located in Charlotte, North Carolina, at the address stated above. It is domesticated and authorized to transact business as a public utility in the State of South Carolina.

Duke Power Company is not owned, controlled or dominated by an alien, a foreign corporation or foreign government. The names and addresses of Duke Power Company's directors and principal officers, all of whom are citizens of the United States, are provided in Appendix A to this document.

(6) FINANCIAL QUALIFICATION

Duke estimates that the total cost of the proposed Oconee Nuclear Station ISFSI will be approximately \$20 million. The financial qualifications of Duke Power Company to engage in the proposed activities are evidenced by the financial data contained in its 1986 Annual Report to Shareholders and Annual Report to the Securities and Exchange Commission (Form 10-K) for the year ending December 31, 1986. These reports are attached as Appendix A and Appendix B, respectively.

Duke Power Company intends to operate the proposed ISFSI facility for the licensed life of the Oconee Nuclear Station. The funds necessary for decommissioning of the proposed ISFSI will be derived from the electrical operating revenues.

(7) SITE LOCATION AND COMPLETION DATES

The proposed ISFSI is located at the Oconee Nuclear Station site within the Owner Controlled Area, Oconee County, South Carolina.

Duke Power Company's projected spent fuel storage requirements will necessitate operation of Oconee Nuclear Station ISFSI by January, 1990. The date for completion of the first phase of construction of ISFSI and the preoperational testing is October, 1989. Earth removal will begin in October, 1988 with first design concrete pours scheduled for April, 1989.

Duke Power Company requests that the license for the proposed ISFSI be granted prior to April, 1989.

(8) RESTRICTED DATA

This application does not contain any restricted data or other defense information, and it is not expected that any will become involved. However, the applicant agrees that it will not permit anyone to have access to such information if it does become involved and will not permit any individual to have access to Restricted Data until the Civil Service Commission shall have

made an investigation and a report to the Nuclear Regulatory Commission on the character, association and loyalty of such individual, and the Nuclear Regulatory Commission shall have determined that permitting such person to have access to Restricted Data will not endanger the common defense and security.

(9) COMMUNICATIONS

It is requested that communications pertaining to this application be sent to:

Hal B. Tucker  
Vice President, Nuclear Production  
Duke Power Company  
P. O. Box 33189  
422 South Church Street  
Charlotte, North Carolina 28242

## CHAPTER 2

### TECHNICAL QUALIFICATIONS

Chapter 9 of the ISFSI Safety Analysis Report provides a discussion of Technical Qualifications of Duke Power Company staff to design, construct, and operate the ISFSI facility. Duke Power Company hereby commits to staff the project with adequate personnel possessing the required skill through all phases of the project.

The ISFSI will utilize a dry storage cask designed by Nutech Engineers, Inc. The Nutech Horizontal Modular Storage (NUHOMS-24P) System is similar to a generic design already approved by the NRC. Duke Power Company engineers have worked in conjunction with Nutech to develop the site specific design. A topical report describing the NUHOMS-24P system design has been submitted by Nutech for NRC review and approval. Duke Power Company is, therefore, knowledgeable in all aspects of the project. Details of Duke organizational structure, preoperational testing and operation of the ISFSI, training program, emergency planning, and physical security plan are contained in Chapter 9 of the ISFSI Safety Analysis Report.



## CHAPTER 3

### TECHNICAL INFORMATION

#### SAFETY ANALYSIS REPORT (SAR)

Duke Power Company began commercial operation of the Oconee Nuclear Station, Units 1, 2 and 3 on July 15, 1973, September 9, 1974 and December 16, 1974, respectively. Since then these three 2568 MW Thermal units have generated millions of KWH in a safe and reliable manner. In so doing, these units have discharged a total of approximately 1750 spent fuel assemblies. These assemblies are currently being stored in two onsite pools and in the McGuire Nuclear Station spent fuel pools.

Duke Power Company intends to construct and operate an ISFSI at its Oconee Nuclear Station to provide long-term interim storage for irradiated fuel assemblies which have been discharged from the reactor and stored in the existing Oconee spent fuel pools. The facility to be installed is based on the system which has been developed by Nutech Engineers, Inc., of San Jose, California; the Nutech Horizontal Modular System (NUHOMS-24P). The NUHOMS-24P system is fully described in the Revision 2 of the Topical Report for the NUHOMS-24P system submitted by Nutech in February, 1988. The SAR describing the technical information for the Oconee ISFSI is provided as an attachment to this License Application.

The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The dry storage canister and horizontal storage module (HSM) have been designed to withstand certain accidents as described in the attached SAR. The fuel assemblies are confined in a helium atmosphere by the stainless steel DSC. The DSC is protected and shielded by a massive concrete HSM. Decay heat is removed by thermal radiation, conduction and convection from the DSC to an air plenum inside the HSM. Air flows through this internal plenum by natural draft convection.

The fuel assemblies to be stored in the ISFSI were or will be irradiated in the Oconee reactors and stored in the Oconee spent fuel pools prior to their transfer to the ISFSI. Twenty-four fuel assemblies are stored in each DSC, and one DSC is stored in each HSM. The DSC containing twenty-four irradiated fuel assemblies is transferred from the spent fuel pool to the HSM in a transfer cask. The cask is precisely aligned and the DSC is inserted into the HSM by means of a hydraulic ram system. The license application requests a license to construct and operate up to a total of eighty-eight modules (2112 assemblies). These modules will be built incrementally, as needed, to match the requirements for additional storage. Operations of the facility will continue for up to 20 years under the initial license and continue under license extension as necessary until a permanent federal repository or other facility is available to receive the spent fuel.

## CHAPTER 4

### CONFORMITY TO GENERAL DESIGN CRITERIA

The Oconee Nuclear Station ISFSI will provide long-term interim storage of irradiated fuel assemblies (IFAs) in a dry environment. The Oconee ISFSI is based on the NUHOMS-24P system and is composed of a series of reinforced concrete horizontal storage modules (HSM). Each HSM will house a stainless steel helium filled dry storage canister (DSC) containing twenty-four IFAs. The sealed DSC serves as a confinement vessel for the IFAs while the HSM provides the biological shielding as well as a passive heat removal system for the decay heat of the IFAs. A description of the principal design criteria is provided in Chapter 3 of the attached SAR.

The mechanical and structural designs of the DSC are based on the physical, thermal and radiological characteristics of the PWR IFAs to be stored within the DSC. The physical characteristics of the PWR IFAs to be stored at the Oconee ISFSI are presented in Table 3.1-1 of the SAR. Additional information on the physical characteristics of these fuel assemblies is contained in Section 4.2 of the Oconee Final Safety Analysis Report (FSAR). Design basis characteristics of IFAs are provided in Table 1.2-1 and Section 3.1-1 of the SAR.

Table 3.3-1 of the SAR lists the major components and functions important to safety. Chapter 6 of this License Application and Chapter 11 of the SAR discuss the quality standards to be applied to these components and functions. Chapter 3 of the SAR describes the design criteria used for the Oconee ISFSI. These criteria establish the design, fabrication, construction, testing, and performance requirements for the structures and components listed in Table 3.3-1. These structures and components are designed to withstand the effects of natural phenomena postulated to occur at the Oconee site without impairing their capability to perform safety functions (see SAR Chapters 2 of 3).

The facility is designed to be totally passive, requiring no utilities or waste processing systems and to utilize Oconee's existing cask handling, fuel handling and associated auxiliary equipment in preparing the IFAs for dry storage. A description of the location and layout of the storage site, operating systems, systems and components and decommissioning plan are described in Chapter 4 of the SAR. Further details of the storage system including Transfer Cask, DSC and HSM are included and fully documented in Reference 3.1 of the SAR.

Structures, systems and components relating to fuel handling activities and storage shall be designed, fabricated, located, shielded, controlled and tested to control external radiation exposures to personnel and public. Chapter 7 of the SAR provides information regarding the Oconee ISFSI radiation protection.

The ISFSI HSM and DSC contain no flammable material and the concrete and steel used for their fabrication can withstand any credible fire hazard. The facility is located such that the station fire brigade can respond to any fire emergency using portable fire suppression equipment (located at the site) or the Oconee site's Fire Protection System. ISFSI initiated explosions are not considered credible since no explosive materials are present in the fission products or cover gases. Section 3.3.6 of the SAR provides detailed information on fire and explosion protection.

The design of the ISFSI also incorporates considerations for decommissioning. Provisions are made to facilitate decontamination of structures and components, and minimize the quantity of, and facilitate the removal of, contaminated materials (see Section 4.6 of the SAR).

## CHAPTER 5

### OPERATING PROCEDURES; ADMINISTRATIVE AND MANAGEMENT CONTROLS

Procedures for operation of the Oconee ISFSI will be developed by Duke Power Company and incorporated into existing Oconee Nuclear Station procedures. Operation of the ISFSI will consist of loading qualified fuel into DSCs, sealing the DSCs, transporting the DSCs to the HSMS, and loading/unloading of the DSC into the modules. Existing Oconee Nuclear Station procedures for handling irradiated fuel in the spent fuel pools and for operation of the spent fuel building crane will be utilized.

Administrative and management controls will be developed and incorporated into the plant operating procedure systems to ensure that the operation of the ISFSI is performed in a safe manner. Chapter 9 of the SAR provides specific information regarding the organizational structure, procedures for preoperational testing and operation, training program, emergency planning and physical security plan. Operating controls and limits are further addressed in Chapter 10 of the SAR.

## CHAPTER 6

### QUALITY ASSURANCE PROGRAM

The activities associated with the ISFSI will be governed by the applicable portions of the Duke Power Company Quality Assurance Program which has been accepted by the NRC. This Quality Assurance Program is described in the Duke Power Company Topical Report, Duke-1-A, which provides a description of the current QA program for those systems, components, items and services which have been determined to be safety related. Further details of the Quality Assurance Program are provided in Chapter 11 of the SAR.

## CHAPTER 7

### OPERATOR TRAINING

The existing training program for Oconee Nuclear Station will be modified to incorporate the training needed for operation of the ISFSI, in accordance with the Duke Power Employee Training and Qualification System (ETQS) Standards Manual. ETQS provides a systemic approach to training as described in the Oconee FSAR, Section 9.1. The training program for ISFSI will include training for operational, maintenance, health physics and security personnel. Section 9.2 of the SAR describes the training program for ISFSI.

## CHAPTER 8

### INVENTORY AND RECORDS REQUIREMENTS

Special Nuclear Material records are currently maintained for Oconee Nuclear Station in accordance with the requirements of 10 CFR 70 for Special Nuclear Materials. These records show the receipt, inventory, disposal, acquisition and transfer of all spent fuel in storage. The material balance, inventory and records for stored materials for the Oconee ISFSI will be in compliance with 10 CFR Part 72, §72.51 requirements. It is expected that materials accountability at the ISFSI will be under a separate Reporting Identification Symbol (RIS) number to be designated by the NRC.

## CHAPTER 9

### PHYSICAL PROTECTION

The physical security program for the Oconee ISFSI addresses the Physical Security Plan, Safeguards Contingency Plan, Design for Physical Security and Guard Training Plan. The plan is safeguards information and is protected and controlled in accordance with 10 CFR 2.790(d) and 10 CFR 73.21. The ISFSI portion of the Oconee Nuclear Station Security Plan has been submitted for NRC review under separate cover.



## CHAPTER 10

### DECOMMISSIONING PLAN

Decommissioning of the ISFSI will be consistent with decommissioning of the Oconee Nuclear Station. This is predicated on the ability of the federal government to accept spent fuel at the rates and dates specified in the Nuclear Waste Policy Act of 1982, as amended. It is anticipated that the DSCs will be transported to a federal repository when such a facility is operational. However, should the storage facility not accept the DSCs intact, the NUHOMS-24P system allows the DSCs to be brought back into the pool and the fuel repositioned into the racks for loading into transport casks to be provided by the Department of Energy.

All components of the NUHOMS-24P system are manufactured of similar materials found in the existing Oconee Station (i.e., reinforced concrete, stainless steel, lead). These components will be decommissioned by the same methods in place to handle similar materials within the plant. Any of these components that may be contaminated will be cleaned and/or disposed of consistent with the decommissioning technology available at the time of decommissioning.

## CHAPTER 11

### EMERGENCY PLAN

The Emergency Program for Oconee Nuclear Station has been determined to be adequate for events which might occur involving the Independent Spent Fuel Storage Installation. The Emergency Program consists of the Oconee Nuclear Station Emergency Plan and the Duke Power Company Crisis Management Plan for Nuclear Stations and their related implementing procedures. Also included are related radiological emergency plans and procedures of state and local governments. The purpose of these plans is to provide protection of plant personnel and the general public and to prevent or mitigate property damage that could result from an emergency at the Oconee Nuclear Station.

The emergency plans have been prepared in accordance with the requirement of 10 CFR Part 50, 50.47 and Appendix E of 10 CFR Part 50. Detailed information on Oconee ISFSI emergency plan are provided in Section 9.5 of the SAR.

## CHAPTER 12

### ENVIRONMENTAL REPORT

To evaluate any environmental effects of the ISFSI which may exceed those resulting from normal plant operation Duke Power Company has prepared a separate Environmental Report which is submitted as an attachment to this License Application. This Environmental Report describes the environmental effects associated with all aspects of the Oconee ISFSI. These effects are found to be sufficiently small so as not to require the preparation of an environmental impact statement. This Environmental Report has been prepared to meet requirements of Subpart A of 10 CFR 51 and Subpart E of 10 CFR 72.

## CHAPTER 13

### PROPOSED LICENSE CONDITIONS

Administrative and management organization; procedures and controls, including review and approval activities; auditing and reporting requirements; and interfaces between Duke Power Company and its contractors for the Oconee Nuclear Station ISFSI will be incorporated into existing Oconee programs as noted in Chapter 5 of this License Application. The construction and operation of the ISFSI will be performed under the guidance of applicable portions of the existing Duke Power Company Quality Assurance Program (See Chapter 6).

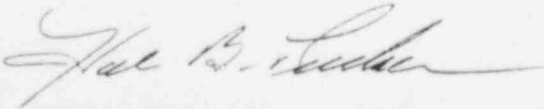
The Oconee ISFSI is a totally passive system which requires no monitoring instrumentation and a minimum of Operating controls. Chapter 10 of the SAR provides the proposed limiting conditions of operation and surveillance requirements.

CHAPTER 14

CONCLUSION

Duke Power Company respectfully requests that the Nuclear Regulatory Commission issue a license under 10 CFR Part 72 to authorize the activities described in this application and the referenced documents for Duke Power Company to construct and operate an ISFSI for the Oconee Nuclear Station. Duke Power Company commits to conduct activities associated with the Oconee ISFSI in accordance with the requirements of 10 CFR Part 72.

HAL B. TUCKER, being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this request for an ISFSI license under 10 CFR Part 72 for Oconee Nuclear Station (Facility Operating Licenses DPR-38, DPR-47, and DPR-55); and that all statements and matter set forth therein are true and correct to the best of his knowledge.



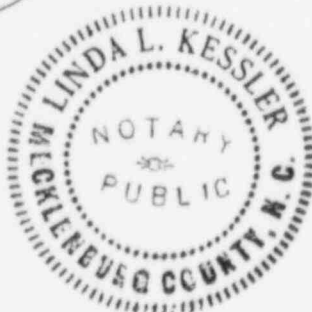
Hal B. Tucker, Vice President  
Nuclear Production  
Duke Power Company

Subscribed and sworn to before me this 31st day of March, 1988.

  
Notary Public

My Commission Expires:

May 1, 1989



APPENDIX B