April 4, 2003

Mr. Dhiaa Jamil
Vice President, McGuire Site
Duke Energy Corporation
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION, UNIT 2 RE: PROCEDURE FOR STRAIGHTENING AN IRRADIATED FUEL ROD (TAC NO. MB7536)

Dear Mr. Jamil:

By letter dated January 31, 2003, you submitted an application for amendment to the operating license for McGuire Unit 2. The amendment would authorize a change to the licensing basis that would allow preparation of a bent fuel rod for storage in a broken rod capsule. The Nuclear Regulatory Commission staff has reviewed the information provided and has determined that additional information is required. Our questions are provided in the Enclosure. We discussed these questions with your staff on March 13 and April 2, 2003. Your staff indicated that a response could be provided by April 30, 2003.

Please contact me at (301) 415-1493, if you have any other questions on these issues.

Sincerely,

/***RA***/

Robert E. Martin, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-370

Enclosure: Request for Additional Information

cc w/encl: See next page

April 4, 2003

Mr. Dhiaa Jamil
Vice President, McGuire Site
Duke Energy Corporation
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION, UNIT 2 RE: PROCEDURE FOR STRAIGHTENING AN IRRADIATED FUEL ROD (TAC NO. MB7536)

Dear Mr. Jamil:

By letter dated January 31, 2003, you submitted an application for amendment to the operating license for McGuire Unit 2. The amendment would authorize a change to the licensing basis that would allow preparation of a bent fuel rod for storage in a broken rod capsule. The Nuclear Regulatory Commission staff has reviewed the information provided and has determined that additional information is required. Our questions are provided in the Enclosure. We discussed these questions with your staff on March 13 and April 2, 2003. Your staff indicated that a response could be provided by April 30, 2003.

Please contact me at (301) 415-1493, if you have any other questions on these issues.

Sincerely,

/***RA***/

Robert E. Martin, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-370

Enclosure: Request for Additional Information

cc w/encl: See next page

DISTRIBUTION:

| | | |
|---|---|---|
| PUBLIC | OGC | CHawes |
| PDII-1 R/F | ACRS | JNakoski |
| LPlisco, RII | RMartin | RHaag, RII |

ADAMS Accession No.: ML 030940679

| OFFICE | PDII-1/PM | PDII-1/LA | PDII1/SC |
|---|---|---|---|
| NAME | RMartin | CHawes | JNakoski |
| DATE | 04/4/03 | 04/3/03 | 04/4/03 |

OFFICIAL RECORD COPY

REQUEST FOR ADDITIONAL INFORMATION

ON SPENT FUEL ROD STRAIGHTENING

DUKE POWER COMPANY

WILLIAM B. MCGUIRE NUCLEAR STATION, UNIT 2

DOCKET NOS. 50-370

Radiological Considerations

1. Given the potential for fuel rod breakage during handling and straightening, and the resultant potential for gross failure and dispersal of fuel pellets or fragments, describe the containment system(s) employed to limit the contamination of the general spent fuel pool (and associated cooling, filtering and makeup systems) during the fuel puncturing and straightening evolutions. For example, are the filter pore sizes sufficiently small to ensure the capture of very small particulates before they cross-contaminate the spent fuel pool cooling system?

2. Describe the extent of station health physics technician (HPT) involvement and job coverage (continuous or intermittent) during the following evolutions (phases) of the project: 1) pre-job planning/briefings, 2) fuel rod movement, penetration and plenum gas collection, and 3) job site and equipment cleanup.

3. Describe the types of radiation surveys and when these will be performed by the HPTs providing job coverage. For example, will the HPT: 1) check external radiation levels of and contamination on materials or equipment removed from the pool; 2) survey for external radiation levels from equipment as it breaks the surface of the pool, to detect unexpected sources of high radiation?

4. Discrete hot particles (fuel and/or activated corrosion and wear products) of sufficient activity to cause significant shallow-dose equivalent and whole body, deep dose exposures can be present in spent fuel pools. Describe the survey program for identifying hot particles, and if found, minimizing their potential spread. For example, how will the licensee ensure that workers decontaminating (wiping down) the special equipment used during this project (prior to packaging and shipment or storage) are protected from unexpected hot particle doses?

5. Describe what training, including the worker training required by 10 CFR Part 19, will be provided to the station staff, relative to fuel rod handling, puncturing and straightening. For example, will this training for plant staff personnel include lessons learned by the contractor relative to the contractor's past experience in these infrequent evolutions?

Enclosure

Reactor Systems Considerations

1. Provide a list of known precedents for this evolution. Additionally, describe how previous lessons learned for this type of maintenance will be covered in the procedures and training for McGuire Unit 2.

2. Provide a detailed description of the current state of the fuel rod. Describe the amount of damage the fuel rod previously incurred including the following: 1) the angle of the bend, 2) the axial location of the bend, 3) any measured or calculated thinning of the cladding due to the bend, and 4) any other pertinent information which classifies the extent of damage.

3. During the performance of the proposed evolution, the potential exists for the cladding of rod I-14 to fail. Since preventing the failure of the cladding will substantially limit both the dose received by the workers and the potential for a criticality accident, the staff requests the licensee to provide a mechanical analysis of the stresses that must be applied to straighten the rod, the predicted failure stress, and the methodology or controls that will be provided to prevent exceeding the fracture point of the cladding. Additionally, the staff requests the licensee to provide a list of criteria used to make the judgement that the rod could be straightened without breaking.

4. The damage to the fuel rod occurred while being inserted into the assembly recage template during the reconstitution of fuel assemblies. A contractor technician failed to follow approved procedures and attempted to force the rod into the template resulting in severe bending of the rod. Due to the infrequency of rod straightening evolutions and the importance of training for infrequent evolutions, the staff requests the licensee to provide information describing the following: 1) the training provided to the personnel responsible for performing the maintenance, 2) the supervisory oversight to be provided, and 3) the controls implemented to limit the potential for additional damage to the rod.

5. During the performance of this evolution, the potential exists for the cladding of rod I-14 to fail. A significant failure of the cladding can result in a release of fuel to the spent fuel pool. The staff requests the licensee to provide an evaluation of the potential for an inadvertent criticality assuming the worst possible release of fuel to the spent fuel pool. Additionally, the staff requests the licensee to justify any assumptions used in the evaluation.

6. The licensee stated that temporary procedure FS-139, “Procedure for Degassing and Straightening of a Mk-BW Fuel Rod”, will be used by Framatome ANP to perform the maintenance on fuel rod I-14 of fuel assembly V27. Due to the potential for additional damage to occur to the fuel rod which could result in a loss of fuel cladding integrity, the staff requests the licensee to make available a copy of temporary procedure FS-139.

cc:
Ms. Lisa F. Vaughn
Legal Department (PBO5E)
Duke Energy Corporation
422 South Church Street
Charlotte, North Carolina 28201-1006

County Manager of
Mecklenburg County
720 East Fourth Street
Charlotte, North Carolina 28202

Michael T. Cash
Regulatory Compliance Manager
Duke Energy Corporation
McGuire Nuclear Site
12700 Hagers Ferry Road
Huntersville, North Carolina 28078

Anne Cottingham, Esquire
Winston and Strawn
1400 L Street, NW.
Washington, DC 20005

Senior Resident Inspector
c/o U.S. Nuclear Regulatory Commission
12700 Hagers Ferry Road
Huntersville, North Carolina 28078

Dr. John M. Barry
Mecklenburg County
Department of Environmental
Protection
700 N. Tryon Street
Charlotte, North Carolina 28202

Mr. Peter R. Harden, IV
VP-Customer Relations and Sales
Westinghouse Electric Company
6000 Fairview Road
12th Floor
Charlotte, North Carolina 28210

Ms. Karen E. Long
Assistant Attorney General
North Carolina Department of
Justice
P. O. Box 629
Raleigh, North Carolina 27602

Mr. C. Jeffrey Thomas
Manager - Nuclear Regulatory
Licensing
Duke Energy Corporation
526 South Church Street
Charlotte, North Carolina 28201-1006

NCEM REP Program Manager
4713 Mail Service Center
Raleigh, North Carolina 27699-4713

Mr. Richard M. Fry, Director
Division of Radiation Protection
North Carolina Department of
Environment, Health and Natural
Resources
3825 Barrett Drive
Raleigh, North Carolina 27609-7721

Mr. T. Richard Puryear
Owners Group (NCEMC)
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745

Mr. H. B. Barron
Vice President, McGuire Site
Duke Energy Corporation
12700 Hagers Ferry Road
Huntersville, NC 28078-8985