



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

**draft**

Mr. Michael S. Tuckman  
Executive Vice President  
Duke Energy Corporation  
526 South Church St  
Charlotte, NC 28201-1006

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2 RE: MIXED OXIDE LEAD  
FUEL ASSEMBLIES (TAC NOS. MB7863, AND MB7864)

Dear Mr. Tuckman:

By letter dated February 27, 2003, you submitted applications for amendment to the operating licenses for Catawba Nuclear Station, Units 1 and 2. The proposed amendments would revise the Technical Specifications to allow the use of four mixed oxide fuel assemblies at the Catawba station. The Nuclear Regulatory Commission staff has reviewed the information provided and has determined that additional information is required as identified in the Enclosure.

We discussed these questions with your staff on October , 2003. Your staff indicated that a response to these issues could be provided by , 2003. Please contact me at (301) 415-1493, if you have any other questions on these issues.

Sincerely,

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

Docket Nos. 50-413, and 50-414

Enclosure: Request for Additional Information

cc w/encl: See next page

REQUEST FOR ADDITIONAL INFORMATION  
ON APPLICATION FOR MOX LEAD TEST ASSEMBLIES  
DUKE POWER COMPANY  
CATAWBA NUCLEAR STATION, UNITS 1 AND 2  
DOCKET NOS. 50-413 AND 50-414

Materials Engineering

Section 3.6.1 of Attachment 3 to the licensee's letter dated February 27, 2003, indicates that the fast flux impacting the reactor vessel will be virtually identical to that for a reactor core consisting entirely of low enriched uranium (LEU) fuel. The licensee states that the Reactor Vessel Integrity Program will manage the reduction in fracture toughness of the reactor vessel beltline region so that the function of the vessel is maintained. The licensee states that the existing pressure-temperature curves in the Catawba Technical Specifications will remain valid with the use of four MOX lead test assemblies.

The Nuclear Regulatory Commission (NRC) staff requests that the licensee identify the capsules, dosimetry and projected neutron fluence for the capsules that will be withdrawn during the period of time that the MOX fuel will be utilized in order that the NRC staff may evaluate whether the Reactor Vessel Integrity Program will adequately manage reduction in fracture toughness. The test results from the reactor vessel material samples should be compared to the results predicted using Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," and dosimetry should be evaluated in accordance with RG 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence."

Environmental Review

1. Describe any change to the types, characteristics, or quantities of nonradiological effluents discharged to the environment as a result of the proposed change.
2. Describe any changes to liquid radioactive effluents discharged as a result of the proposed change.
3. Describe any changes to gaseous radioactive effluents discharged as a result of the proposed change.
4. Describe any change in the type or quantity of solid radioactive waste generated as a result of the proposed change.
5. What is the difference in source characteristics of MOX fuel (compared to LEU fuel) that is considered in accident analysis?

**Draft**

6. What is the expected change in occupational dose expected as a result of the proposed change under normal and DBA accident conditions?
7. What is the expected change in public dose expected as a result of the proposed change under normal and DBA accident conditions?
8. What are the performance characteristics of the packages that will be used to ship irradiated assemblies offsite?
9. What are the expected impacts of transporting the fresh MOX assemblies (to workers/drivers and to the public) under normal and accident conditions?
10. What are the expected impacts of transporting the irradiated MOX assemblies (to workers/drivers and to the public) under normal and accident conditions?

**draft**