Duke Power
A Duke Energy Company

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May 13, 2004

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Duke Energy Corporation Catawba Nuclear Station Units 1 & 2, Docket Nos. 50-413, 50-414 Proposed Amendments to the Facility Operating License and Technical Specifications to Allow Insertion of Mixed Oxide (MOX) Fuel Lead Assemblies (Correspondence Review)

References:
(1) Letter, April 16, 2004, H. B. Barron (Duke) to U. S. Nuclear Regulatory Commission, Proposed Amendments to the Facility Operating License and Technical Specifications to Allow Insertion of Mixed Oxide (MOX) Fuel Lead Assemblies (MOX in Catawba 1 Cycle 16)

(2) Letter, February 27, 2003, M. S. Tuckman (Duke) to U. S. Nuclear Regulatory Commission, Proposed Amendments to the Facility Operating License and Technical Specifications to Allow Insertion of Mixed Oxide (MOX) Fuel Lead Assemblies and Request for Exemption from Certain Regulations in 10 CFR Part 50

In Reference 1, Duke supplied additional information to the NRC in support of the license amendment application for receipt and use of four MOX fuel lead assemblies (Reference 2). The material in reference one identified Catawba 1 Cycle 16 (C1C16) as the first fuel cycle in which Duke intends to load the four MOX lead assemblies. The planned cycle design includes 181 Westinghouse Robust Fuel assemblies (RFAs) and also includes eight Westinghouse Next Generation Fuel (NGF) assemblies. The eight NGF assemblies were previously loaded in C1C15; hence those assemblies will be in their second cycle of operation in C1C16. The NGF LTA design is very similar to the Westinghouse Robust Fuel Assembly (RFA) design.

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Duke provided some basic design characteristics of the Next Generation Fuel in Reference 1 and subsequently met with the NRC staff to further describe the core design for Catawba 1 Cycle 16. In addition, Reference 1 indicated that Duke was undertaking a review of the license amendment application material and would provide the NRC staff with a written summary of that review. The review is documented in the Duke corrective action program as PIP G-04-157. Attachment 1 to this letter contains specific items that Duke has determined should be clarified. None of these clarifications is expected to have an impact on prior staff review. Please contact Mike Cash at (704) 382-5826 regarding this or any other matters related to the MOX fuel lead assemblies.

Sincerely,

H. B. Barron
Executive Vice President – Nuclear Generation
Duke Energy Corporation

Attachment 1- Summary of Items from Correspondence Review

Oath and Affirmation

I affirm that I, H.B. Barron, am the person who subscribed my name to the foregoing, and that all the matters and facts set forth herein are true and correct to the best of my knowledge.

H.B. Barron

Subscribed and sworn to before me on this ~~May~~ 13rd day of May 2004.
MTC

Notary Public

My Commission expires:

January 22, 2008
Date

MICHAEL T. CASH
Notary Public
Lincoln County, North Carolina
Commission Expires January 22, 2008

cc: w/attachments

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NRIA File/ELL - EC05O
MOX File 1607.2304
Catawba Document Control File 801.01– CN04DM
Catawba RGC Date File (J. M. Ferguson – CN01SA)

Attachment 1
Summary of Items from Correspondence Review

Item No	Document/Section Description	Item Description	Clarification
1	2/27/03 License Amendment Request (LAR), Att. 3, Section 3.2	Paragraph 2 identifies the "nominal average total plutonium concentration" of the MOX fuel lead assemblies and the nominal plutonium concentrations of each zone. These are nominal values and are subject to change during the core design process. In fact, the currently-planned values are slightly different (4.35% vs. 4.37%).	These values are representative and are not final design values. This should be clear from the totality of the application (e.g., Section 3.5.1, "maximum expected plutonium concentration is 4.94 weight percent") and the MOX Fuel Design Report (BAW-10238 (P), Rev. 1).
2	2/27/03 License Amendment Request (LAR), Att. 3, Appendix 3-1, A3.3	Reference values of MOX fuel assembly plutonium concentration and isotopics are provided.	These values are representative and are not final design values. See Item 1.
3	2/27/03 License Amendment Request (LAR), Att. 3, Appendix 3-1, A3.6, p. A3-12	Reference values of isotopics are provided.	These values are representative and are not final design values. See Item 1.
4	2/27/03 License Amendment Request (LAR), Att. 4, Section 4.2.1.1	The cited failure rate (less than one per 100,000 rods, from all manufacturing related causes) is subject to change.	This value was meant to be representative and subject to change with time. There are additional Mk-BW failures under review.
5	12/10/03 Request for Additional Information (RAI) Response Letter, Attachment 1	The response to #2 does not clearly state that the MOX fuel lead assembly burnup and peaking factor projections for three cycles are representative, not final values.	There was telephonic discussion with the NRC that made this point clear.
6	2/2/04 RAI Response Letter, Att. 1, Introductory Response	Paragraph 2 refers to a failure rate (less than one per 100,000 rods, from all manufacturing related causes) that is subject to change.	Same as Item 4.

Item No	Document/Section Description	Item Description	Clarification
7	2/27/03 License Amendment Request (LAR), Attach. 3, Technical Justification, Sec. 3.6.3	This section does not specifically mention COPERNIC.	COPERNIC is also used for fuel rod analyses, and was the subject of a stand alone topical report for this purpose and was subject to review at the time of the application.
8	11/03/03 RAI Response Letter, Question 31 (pg. 70)	Discusses RFA & Mark-BW/MOX1, but not NGF (the question asks about maximum allowable peaking (MAP) limits, not what CHF correlations are used)	The Next Generation Fuel will have specific MAP limits developed or determined to be bounding for DNBR analyses. The WRB-2M DNB correlation is applied to the NGF assemblies. This application has been confirmed by Westinghouse as the appropriate correlation.
9	11/03/03 RAI Response Letter, Question 29 (pg. 58) Duke Response to RAIs	Analysis of mixed core addresses RFA/MOX core but does not discuss mixed core effects of NGF assemblies.	Duke has determined an exclusion zone of separation between MOX and NGF fuel assemblies to prevent hydraulic interactions between the two fuel assembly types.
10	2/27/03 License Amendment Request (LAR), Table 3-6 (page 3-44) and 11/3/03 RAI response Table Q14-1	The peak cladding temperature (PCT) identified in Table 3-6 (LAR) for the MOX analysis is 2018 F. A similar case presented in the response to question 14 (RAI response, Table Q14-1) shows a somewhat different PCT of 1919.2 F. The difference in PCTs is somewhat attributable to a different assumed location for the axial peak, but this does not explain all of the difference.	Table 3-6 presents the results from an early MOX-low enriched uranium (LEU) analysis. There were minor adjustments made to the model inputs between the time of the Table 3-6 analysis and the performance of the analyses that provided the detailed MOX fuel lead assembly LOCA limits shown in Table Q14-1. The minor adjustments do not affect the conclusions about relative differences between MOX and LEU based on Table 3-6 (Table 3-6 study remains valid for that purpose). The actual MOX lead assembly LOCA limits (Table Q14-1) are based on the most up-to-date model inputs.