Duke Energy

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August 7, 2002

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

Subject: Duke Energy Corporation (DEC)
McGuire Nuclear Station Units 1 and 2
Docket Numbers 50-369 and 50-370
Technical Specifications Amendment Request for Additional Information (RAI); TS 3.7.15 - Spent Fuel Assembly Storage, and TS 4.3 - Fuel Storage

Reference: DEC letter to NRC dated August 1, 2000, and DEC letter to NRC dated April 18, 2002

This letter provides additional information that was requested by the NRC staff during a teleconference call on July 30, 2002. The NRC staff's question and DEC's response are stated below. Also, as discussed during the telecon, DEC is making a correction on page 8 of Attachment 6 to the April 18, 2002 License Amendment Request (LAR) submittal. The last complete sentence on the page is modified to state "The results of this analysis indicate that the size gap required before an increase in reactivity is observed is ~~less~~ *more* than the size of gaps observed in recent measured data." The corrected page is included with this letter as an attachment.

Question:

What is the basis for the 40% threshold for remaining Boraflex for the Region 2A cells in the recent McGuire LAR? Is this supported by BADGER measurements and/or RACKLIFE analyses?

Response:

BADGER measurements were initially performed in the McGuire Unit 2 spent fuel pool (SFP) in 1997. These BADGER results were used to baseline the RACKLIFE computer models for the SFP racks. The RACKLIFE model determined the future degradation of the Boraflex in the SFPs and these analyses indicated that no Region 2 panels would degrade below 50% remaining Boraflex through 2006. Therefore, the threshold for designating Region 2A panels

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in the original LAR submitted on April 5, 1999 was 50%. It was DEC's intent at that point, and it remains our intent today, to have a permanent solution to the Boraflex degradation issue implemented by 2006.

DEC also committed to continued monitoring of the Boraflex in the pools at an interval not to exceed 3 years; therefore, another BADGER campaign was conducted in both of the McGuire SFPs during 2000. The RACKLIFE model was re-baselined with the new BADGER results, and then used to determine the future performance of the Boraflex panels in both SFPs. The results of these revised RACKLIFE models indicated that a significant number of Region 2 panels would degrade below 50% remaining Boraflex prior to the end of 2006. However, these analyses also showed that no Region 2 panels degraded below 40% remaining Boraflex prior to 2006. Therefore, 40% was used as the threshold for Region 2A panels in the latest LAR. While this new 40% threshold will impose an immediate more restrictive loading configuration for the Region 2 storage cells in both pools, it will ultimately provide a significant reduction in the number of spent fuel assembly movements required prior to DEC's implementation of a permanent solution.

DEC is still working toward implementing a permanent solution by 2006. A purchase order was recently issued for new rack modules in Region 1 of both McGuire SFPs, and proposals are currently being evaluated for permanent solutions for Region 2. Additionally, DEC accelerated plans for the next BADGER measurement campaign which was originally scheduled for 2003. A new BADGER campaign was performed in both SFPs in July 2002, and final results should be available in the next few months.

Please contact Norman T. Simms of Regulatory Compliance at 704-875-4685 with any questions with respect to this matter.

Very truly yours,

H. B. Barron

Attachment

xc: (w/attachment)

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Dhiaa M. Jamil, being duly sworn, states that he is Acting-Vice President of McGuire Nuclear Station; that he is authorized on the part of Duke Energy Corporation to sign and file with the U.S. Nuclear Regulatory Commission these revisions to the McGuire Nuclear Station Facility Operating Licenses Nos. NPF-9 and NPF-17; and, that all statements and matters set forth therein are true and correct to the best of his knowledge.

Dhiaa M. Jamil, Acting-Vice President
McGuire Nuclear Station
Duke Energy Corporation

Subscribed and sworn to before me on August 7, 2002.

Deborah S. Rome
Notary Public Deborah S. Rome

My Commission Expires: December 19, 2004

bxc: (w. attachments)

T.C. Geer (MG05EE)
K.L. Crane (MG01RC)
T.M. Luniewski (MG05EE)
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C.J. Thomas (MG01RC)
N.T. Simms (MG01RC)
ELL (EC050)
NSRB Support Staff (EC05N)
Masterfile 1.3.2.9

ATTACHMENT

(Revised page in April 18, 2002 LAR submittal)

is the minimum standard loading offered by the vendor. The IFBA coating is reduced to 75% of this value to account for the IFBA coating not being applied for the full length of the fuel rod.

3.1 No Boron 95/95 k_{eff}

This section describes the methodology used to determine the limits for the k_{eff} calculation with no boron including all biases and uncertainties (95/95 k_{eff}).

The 95/95 k_{eff} must be less than 1.0 with no boron. The calculation of the 95/95 k_{eff} must consider various biases and uncertainties related to the materials and construction of the racks. Specifically, the biases and uncertainties accounted for in the McGuire spent fuel pool criticality analysis are the bias and uncertainty associated with the benchmarking of the methodology, biases and uncertainties associated with the affect of Boraflex shrinkage, a bias to account for the underprediction of reactivity due to self shielding, a bias to account for 3-dimensional effects not captured by the 2-dimensional model and the uncertainty due to mechanical tolerances from the manufacturing process. The mechanical tolerance uncertainty is comprised of the following components: cell ID, CTC spacing, cell thickness, Boraflex width, plenum thickness, enrichment, fuel pellet dish volume, fuel pellet theoretical density, fuel pellet OD, clad OD and assembly position within the storage cell. For the no boron 95/95 k_{eff}, these biases and uncertainties are generated at no boron conditions. Additional uncertainties related to burned fuel are discussed with the burnup credit methodology. Table 4 lists the biases and uncertainties for each region.

The uncertainties associated with the effect of Boraflex shrinkage include the following. A reactivity bias is included to account for an assumed 0.25 inches of shrinkage in the width of the Boraflex panels. A reactivity uncertainty is included to account for the 95/95 worst case shrinkage in the axial direction (end pullback of the top and bottom). No reactivity penalty is included to account for gaps in the middle of the Boraflex panels, nor are any gaps included in the models. However, an analysis was performed to determine the maximum gap size before an increase in reactivity occurs. This analysis looked at a gap in one out of four panels, two out of four and four out of four panels. The results of this analysis indicate that the size gap required before an increase in reactivity is observed is more than the size of gaps observed in recent measured data. Hence, no reactivity penalty is necessary to account for gaps in the