April 30, 2004

LICENSEE: Duke Energy Corporation

FACILITY: Catawba Nuclear Station, Units 1 and 2

SUBJECT: SUMMARY OF MEETING ON APRIL 23, 2004, WITH DUKE ENERGY ON MIXED OXIDE FUEL

Representatives of the Duke Energy Corporation (Duke), met with members of the Nuclear Regulatory Commission (NRC) staff at NRC Headquarters on April 23, 2004, in Rockville, Maryland. The meeting addressed issues related to Duke's application dated February 27, 2003, as supplemented, to use mixed oxide (MOX) lead test assemblies (LTAs) at the Catawba Nuclear Station. A list of attendees is provided in Enclosure 1. Duke's handouts provided in the meeting are provided in Enclosure 2.

The meeting was held to discuss the issue that was addressed in Duke's letter dated April 16, 2004. Duke's letter discusses the licensee's current plans for the reactor core that would, if approved by the NRC, include MOX LTAs in fuel Cycle 16 for Catawba Unit 1 (C1C16). The application, as supplemented, describes the C1C16 core as including 189 fuel assemblies of the Westinghouse Robust Fuel Assembly (RFA) design and four MOX LTAs. As the NRC staff learned on April 12, 2004, and as described in Duke's letter dated April 16, 2004, Duke's current plans are that C1C16 would include 181 RFA fuel assemblies, the four MOX LTAs and eight assemblies of the Westinghouse Next Generation Fuel (NGF) design. The NRC staff's safety evaluation for the MOX LTAs, issued on April 5, 2004, did not explicitly consider the NGF fuel assemblies. Therefore this meeting was held to discuss the degree to which the NGF and RFA designs are similar and thus the extent to which information previously submitted by Duke continues to be bounding for the MOX core.

Duke's slides 1- 5, provided in Enclosure 2, provide introductory information. Slide 6 describes a review by Duke to ensure consistency between the planned C1C16 design and all documents associated with its application of February 27, 2003, as supplemented. Duke has committed to provide the NRC with a summary of that review.

Slide 8 states that the goal of the NGF design is to eliminate a grid to rod fretting failure mechanism in 17 x 17 fuel and that the basic geometry of NGF fuel is the geometry of the 17 x 17 RFA with improved features.

A qualitative summary of the differences between RFA and NGF fuel was provided with the statement in slide 9 that the most significant change is in the grid design, location and performance. Slide 9 also states that departure from nucleate boiling (DNB) was calculated with the existing RFA critical heat flux (CHF) correlation, which was identified in the meeting as the WRB-2M correlation and that CHF performance was verified by testing at Columbia University in 2003. The NRC staff expressed interest in verifying the applicability of the WRB-2M correlation to NGF fuel and in the recently developed CHF test data.

Slides 9 and 10 state that the VIPRE-01 code was used for the NGF analyses and that fuel reliability is evaluated by analyzing fuel assembly crossflow velocities. Slides 11 and 12 identify core loading exclusion zones to preclude any local crossflow issues. The NRC staff expressed interest in further information on these issues.

Slide 13 identifies the use of the PAD code for analysis of RFA and NGF fuel and the COPERNIC code for MOX LTAs. The NRC staff expressed interest in the applicability of PAD to NGF fuel.

Slide 14 states that for the fuel rod mechanical analysis, generic analyses demonstrate that the performance of the limiting rod is within the fuel rod design limits and that this is then verified for each reload cycle. Duke stated that a mixed core of NGF, RFA and MOX LTAs would have no impact on the generic fuel rod analyses.

Slides 15 - 20 addressed loss of coolant accident (LOCA) analyses and concluded that introduction of NGF fuel would not significantly impact results for MOX LTAs. It was noted that the previously calculated limiting value of 2056 °F would need to be revised to account for recent ECCS code analysis changes.

Slides 21 - 24 addressed non-LOCA analyses, stating that all three fuel types will be explicitly evaluated in the standard reload process.

Summary slide 25 stated that cycle specific reload analysis will explicitly confirm acceptable performance of all three fuel types prior to completion of the reload safety evaluation.

The NRC staff also asked whether the power history information that had been submitted in support of the dose consequence analyses had been impacted by the inclusion of NGF fuel and was advised by Duke that it had not changed.

The NRC staff summarized by stating that it is encouraging to learn that the licensee had previously performed analyses for the three fuel types. The NRC staff indicated that the primary areas of staff interest that could be identified at the time of the meeting include the CHF analysis for NGF fuel, the crossflow calculations and use of the VIPRE code and defined exclusion zones and the vendor fuel design reports for RFA and NGF fuels. The NRC staff indicated that it would consider the most useful way of obtaining this information.

Several members of the public asked questions at the conclusion of the meeting. This included a question on how and when the NRC staff first learned of the inclusion of NGF fuel in the C1C16 core. The NRC staff replied that this was in an oral communication with a Duke representative on April 12, 2004. A question was also asked on whether the licensee could determine whether a leaking fuel assembly was a low enriched uranium assembly or a MOX assembly. The answer was that, except for very specific isotopic ratios that can occur at specific times in core life, fuel failures could not be associated during power operation with specific fuel designs in the core.

/RA/

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

Enclosures: 1. List of Meeting Participants
2. Duke's Handouts

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Robert E. Martin, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
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Meeting Notice:ML041070480 Package: ML041230011
Meeting Summary:ML041230012 Enclosure 2:

OFC	PDII-1/PM	PDII-1/LA	PDII-1/SC
NAME	RMartin:as	CHawes	JNakoski
DATE	04/30/04	04/30/04	04/30/04

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Dated: April 30, 2004

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TMensah

ATTENDEES LIST

APRIL 23, 2004

MEETING WITH DUKE ENERGY

NAME	ORGANIZATION
Bob Martin	NRC
Frank Akstulewicz	NRC
Zahira Cruz	NRC
Steve La Vie	NRC
Marvin Itzkowitz	NRC
Susan Uttal	NRC
Antonio Fernandez	NRC
Ralph Landry	NRC
Ed Hackett	NRC
Anne Cottingham	Winston & Strawn
Ralph Caruso	NRC
Daniel Horner	McGraw Hill
Jay Verbos	Duke Power
Jim Eller	Duke Power
Michael Scott	Duke Power
Tom Geer	Duke Power
Bob Harvey	Duke Power
Kenny Epperson	Duke Power
Mike Cash	Duke Power
Dave Lochbaum	UCS

Enclosure 1

Catawba Nuclear Station

cc:

Lee Keller, Manager
Regulatory Compliance
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745

Ms. Lisa F. Vaughn
Duke Energy Corporation
Mail Code - PB05E
422 South Church Street
P.O. Box 1244
Charlotte, North Carolina 28201-1244

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

North Carolina Municipal Power
Agency Number 1
1427 Meadowwood Boulevard
P. O. Box 29513
Raleigh, North Carolina 27626

County Manager of York County
York County Courthouse
York, South Carolina 29745

Piedmont Municipal Power Agency
121 Village Drive
Greer, South Carolina 29651

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

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

North Carolina Electric Membership Corp.
P. O. Box 27306
Raleigh, North Carolina 27611

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
4830 Concord Road
York, South Carolina 29745

Henry Porter, Assistant Director
Division of Waste Management
Bureau of Land and Waste Management
Dept. of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201-1708

Mr. R. L. Gill, Jr., Manager
Nuclear Regulatory Issues
and Industry Affairs
Duke Energy Corporation
526 South Church Street
Mail Stop EC05P
Charlotte, North Carolina 28202

Saluda River Electric
P. O. Box 929
Laurens, South Carolina 29360

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

Mary Olson
Director of the Southeast Office
Nuclear Information and Resource Service
729 Haywood Road, 1-A
P. O. Box 7586
Asheville, North Carolina 28802

Catawba Nuclear Station

cc:

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

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

Diane Curran
Harmon, Curran, Spielberg &
Eisenberg, LLP
1726 M Street, N.W.
Suite 600
Washington, DC 20036

D. M. Jamil
Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745-9635