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A Duke Energy Company

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August 14, 2003

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

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
Request For Relief (RFR) 03-004

References: (1) Letter from Surry Nuclear Power Station to NRC, dated September 30, 2002, and (2) Letter from Surry Nuclear Power Station to NRC, dated April 10, 2003

Pursuant to10CFR50.55a(a)(3)(ii), Duke Energy Corporation (Duke) requests relief from the 1989 ASME Section XI Code requirement as stipulated in Paragraph IWA-2430(d) on the basis that the requirement imposes hardships without a compensating level of quality and safety. Relief is requested to extend the inspection interval for performing the McGuire Unit 2 reactor vessel examinations beyond the one-year Code allowable extension to encompass the entire duration of the Spring 2005 refueling outage. However, inspections shall be completed before the end of the outage, which shall be accomplished prior to June 1, 2005. The enclosed relief request provides a basis for why the proposed alternative will provide an acceptable level of quality and safety.

Duke requests approval of the relief request by March 1, 2004. A similar relief request was submitted for approval by the Surry Nuclear Power Plant as addressed in references (1) and (2) above.

Please direct questions regarding this request to Norman T. Simms of Regulatory Compliance at (704) 875-4685.

Sincerely,

G. R. Peterson

Enclosure

A047

xc w/enclosure:

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ENCLOSURE

RELIEF REQUEST NO. 03-004

Duke Energy Corporation

Station: McGuire Nuclear Station Unit 2

Request for Relief No. 03-004

Duke Energy Corporation (Duke) has determined that conformance with certain ASME Section XI Code requirements will create a hardship. Therefore, pursuant to 10CFR50.55a (a)(3)(ii), Duke requests relief from certain portions of the code.

ASME Section XI Code of Record: 1989 Edition with No Addenda
ISI Plan Status: Third Inspection Period of the Second 10-Year Interval of Inspection Program B

I. System/Components for which Relief is Requested:

Category	Item No.	Description
B-A	B1.11	Circumferential Shell Weld
B-A	B1.21	Circumferential Head Weld
B-A	B1.22	Meridional Head Weld
B-A	B1.30	Flange-to-Upper Shell Weld
B-D	B3.90	Nozzle-to-Vessel Weld
B-D	B3.100	Nozzle Inside Radius Weld
B-F	B5.10	Dissimilar Metal Nozzle-to-Safe End Butt Weld
B-F	B5.130	Dissimilar Metal Piping $\geq$ 4 inch NPS Butt Weld
B-N-1	B13.10	Reactor Vessel Interior
B-N-2	B13.60	Interior Attachments Beyond Beltline
B-N-3	B13.70	Removable Core Support Structure

II. Code Requirement:

IWA-2430(a) – The inservice examinations and system pressure tests required by IWB, IWC, IWD and IWE shall be completed during each of the inspection intervals for the service lifetime of the power unit. The inspections shall be performed in accordance with the schedule of ... Inspection Program B of IWA-2432.

IWA-2430(d) – For components inspected under Program B, each of the inspection intervals may be extended or decreased by as much as 1 year. Adjustments shall not cause successive intervals to be altered by more than 1 year from the original pattern of intervals.

III. Code Requirement from which Relief is Requested:

Relief is requested from the requirement of IWA-2430(d) that an interval extension be no more than one year.

IV. Basis for Requesting Relief:

The end date of the current 10-year interval is February 29, 2004. As allowed by code paragraph IWA-2430(d), Duke plans to use the one year interval extension to capture an additional refueling outage in which to conduct the unit's 10-year reactor vessel inspections. However, based on the projected start date and duration of refueling outage 2EOC-15 and the fuel cycle design for cycle 16, the next scheduled refueling outage (2EOC-16) start date could potentially be beyond the one year extended inspection interval end date of February 28, 2005. Also, the schedule impact of an extension of the 2EOC-15 refueling outage duration and/or any forced outage(s) during cycle 16 could push the outage date out further. Therefore, relief is requested to perform the second interval reactor vessel examinations beyond the Code allowable one-year extension period, to encompass the entire duration of the spring 2005 refueling outage.

Eight of the welds requiring volumetric examination during the 10-year reactor vessel inspection are Category B-F dissimilar metal (DM) welds. Duke management's decision to use the one year interval extension was based on recent developments in the Performance Demonstration Initiative (PDI) DM weld program. Currently, ultrasonic technology (UT) requires depth sizing detected flaws to an accuracy of 0.125 RMS as specified in Supplement 10 of Appendix VIII. At this time, no reactor vessel inspection vendor within the industry has qualified to the requirements of ASME Section XI, Appendix VIII Supplement 10 for DM welds with the configuration and wall thickness of those at McGuire.

Due to the configuration of the core barrel, inspection of four of the eight DM welds will require its removal. To perform inspections on the non-DM welds during the upcoming outage (2EOC-15) and defer the DM welds to outage 2EOC-16 (i.e. partial scope inspections or partial deferral) would require pulling the core barrel twice (once in each outage). This would be an obvious hardship (without any compensating increase in quality or safety) that would result in extra work/dosage incurred and would significantly increase the potential for damage to plant components from performing the core barrel movement (a "high risk evolution") in both outages 2EOC-15 and 2EOC-16.

V. Alternate Examination:

None. The reactor vessel inspections must be performed by a technically capable inspection vendor during a unit refueling outage to allow access to the inside surfaces of the vessel and its primary nozzles. Furthermore:

a.) MNS-2 has cast stainless steel primary coolant piping which is not conducive to UT examination.

b.) External UT examination of the Category B-F dissimilar metal welds is not an alternative because there is no qualified technique for UT of the cast stainless steel reactor coolant piping material in McGuire Unit 2. Due to the nozzle geometry, they cannot be examined from the nozzle side either.

c.) Radiographic Testing (RT), though an acceptable Code test method, is not a preferred alternative because it may not show the early initiation of some failure mechanisms such as thermal fatigue or stress corrosion cracking.

VI. Justification for Granting Relief:

The Electric Power Research Institute (EPRI) issued a Technical Update in July on their Guidelines for Implementation of Appendix VIII and 10CFR50.55a that stated (under Supplement 10) that a request for relief would be needed for DM welds due to the inability of current UT examination technology to depth size flaws to the 0.125 RMS accuracy requirements. Resolution of this issue in time for implementation, planning, scheduling and performance of all reactor vessel inspections in outage 2EOC-15 (scheduled to start in early September, 2003) is unlikely. In addition, a manual process/procedure for depth sizing any detected flaws has not been developed.

Given current problems with flaw sizing technology it is possible that inaccurate results could lead to increased dose and unnecessary reactor vessel repairs which would compound the hardship to the station. The following possibilities are of special concern:

1) Finding a flaw, then conservatively characterizing it as being unacceptable, but being able to analytically evaluate and accept it. The hardship would be subsequent reexaminations during the next three inspection periods per IWB-2420(b).

2) Finding a flaw, then conservatively characterizing it as being unacceptable, but being unable to analytically evaluate and accept it. The hardship would be the requirement to perform a (possibly unnecessary) component repair.

Deferring the reactor vessel inspections including the DM weld examinations to outage 2EOC-16 would allow an additional 18 months for industry testing, research, technology and vendor qualifications to develop toward resolution of the issues that are currently unresolved, according to NRC Regulatory Issue Summary (RIS) 2003-01. Using vendors qualified to the improved techniques and qualifications resulting from this additional research and technology would contribute to the enhancement of the safety of the plant as opposed to subjecting the station to the risks associated with possible unnecessary reactor vessel flaw repairs. This would enable McGuire to perform the reactor vessel inspections using improved technology while moving the reactor vessel internals only once. This presents a scenario that is more conducive to overall plant health and safety of the general public.

VII. Implementation Schedule:

Inspections requiring PDI automated UT and normal visual examinations on the reactor vessel and adjacent nozzle welds will be performed during refueling outage 2EOC-16. Inspections shall be completed before the end of the outage, which shall be accomplished prior to June 1, 2005. If changes occur to the refueling outage schedule that could extend the outage completion beyond this date, Duke will notify the NRC in a separate letter.

In conjunction with the extended Second Interval reactor vessel exams listed in this relief request, McGuire plans to perform the inservice inspection examinations that are currently scheduled for 2EOC-16. These exams will begin the Third Interval inspection process.