

July 14, 2004

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

ATTENTION: Document Control Desk

SUBJECT: Duke Energy Corporation
Oconee Units 1, 2, & 3
Docket Nos. 50-287
McGuire Nuclear Station, Units 1 & 2
Docket Nos. 50-370
Catawba Nuclear Station, Units 1 & 2
Docket Nos. 50-413, 50-414

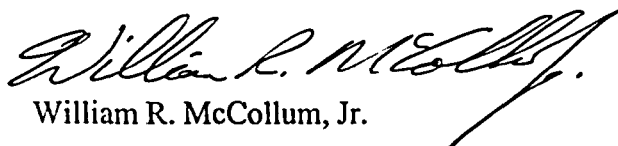
Relief Request for Alternative to ASME Section XI
Relief Request 04-GO-002

Pursuant to 10 CFR 50.55a (a) (3) (i), Duke Energy Corporation (Duke) requests the use of an alternative to the ASME Boiler and Pressure Vessel Code, Section XI, IWA-2232, 1989 Edition with no addenda for the 10-year RPV examinations scheduled for the fall outages at Catawba Unit 2 and Oconee Unit 3; the spring 2005 outage for McGuire Unit 2 and the spring 2006 outage at Catawba Unit 1.

Specifically, Duke requests relief from the requirement to perform ultrasonic examination of the RPV Upper Shell to Flange Weld using Section XI, Appendix I which in turn references ASME Section V, Article 4. The additional guidance of Regulatory Guide 1.150, Revision 1 also applies. Duke requests approval to use, as an alternate, an ultrasonic procedure, personnel and equipment qualified in accordance with ASME Section XI, Div. 1, Appendix VIII, Supplement 4 and Supplement 6, 1995 Edition with the 1996 Addenda as administered by the Performance Demonstration initiative (PDI) to examine the RPV Upper Shell to Flange Welds at McGuire Unit 2, Oconee Unit 3 and Catawba Units 1 and 2.

A detailed description of the proposed alternative and justification is included as an attachment to this letter. Duke is requesting approval of this request by September 10, 2004 to support the fall outages for Catawba Unit 2 and Oconee Unit 3. Questions regarding this request may be directed to M. H. Hazeltine at 704-382-5880.

Very truly yours,


William R. McCollum, Jr.

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Attachment

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**Duke Energy Corporation
CATAWBA UNITS 1 AND 2
McGUIRE UNIT 2
OCONEE UNIT 3
REQUEST FOR RELIEF No. 04-GO-002**

Pursuant to 10 CFR50.55a (a) (3) (i), Duke Energy Corporation proposes an alternative to the requirements of ASME Section XI, Subsection IWA-2232, 1989 Edition with no addenda.

I ASME Code Component (s) Affected:

Class 1 Reactor Pressure Vessel (RPV) Upper Shell to Flange Weld.

ASME Section XI Category B-A, Item Number: B01.030.001

McGuire Unit 2 2RPV-W07

Oconee Unit 3 3RPV-WR19

Catawba Unit 1 1RPV-W07

Catawba Unit 2 2RPV-101-121

II Applicable Code Edition and Addenda:

ASME Section XI, 1989 Edition with no addenda.

III Applicable Code Requirement:

ASME Section XI, IWA-2232, Ultrasonic examination shall be conducted in accordance with Appendix I.

IV Reason for Request:

Duke Energy Corporation is required to perform ultrasonic examination of the RPV Upper Shell to Flange Weld using Section XI, Appendix I which in turn references ASME Section V, Article 4. The additional guidance of Regulatory Guide 1.150, Revision 1 also applies. This is the only circumferential weld in the RPV that is not examined in accordance with the requirements of ASME Section XI, Appendix VIII since the issuance of Federal Register Notice 64 FR 51370, dated September 22, 1999 which mandated use of ASME Section XI, Appendix VIII, Supplement 4 and Supplement 6 for RPV examinations.

V Proposed Alternative and Basis for Use:

In lieu of the requirements of ASME Section V, Article 4, Duke Energy Corporation proposes to use an ultrasonic procedure, personnel and equipment qualified in accordance with ASME Section XI, Div. 1, Appendix VIII, Supplement 4 and Supplement 6, 1995 Edition with the 1996 Addenda as

administered by the Performance Demonstration Initiative (PDI) to examine the RPV Upper Shell to Flange Welds at McGuire Unit 2, Oconee Unit 3 and Catawba Units 1 and 2.

ASME Section V, Article 4 describes the required techniques to be used for the ultrasonic examination of welds in ferritic pressure vessels greater than 2 inches in thickness. These techniques were first published in ASME Section V, Article 4, 1974 Edition, Summer 1975 Addenda. The calibration technique, recording criteria and flaw sizing methods are based on the use of a distance-amplitude-correction curve (DAC) derived from machined reflectors in a basic calibration block.

Prior ultrasonic examination of the RPV welds used recording thresholds of 50% DAC for the outer 80% of the examination volume and 20% DAC from the clad/base metal interface to the inner 20% of the examination volume. Therefore, ultrasonic indications below the 20% DAC threshold at the clad/base metal interface and below 50% DAC in the remaining volume were not required to be recorded. Use of the Appendix VIII qualified procedure would enhance the detection sensitivity because the procedure requires the vendor to evaluate all indications determined to be flaws regardless of amplitude. The recording thresholds in ASME Section V, Article 4 and Regulatory Guide 1.150, Rev. 1 are arbitrary and do not consider flaw orientation which affects amplitude response.

EPRI Report NP-6273, March 1989 indicates that flaw sizing techniques based on tip diffraction are the most accurate. The Appendix VIII qualified procedure uses tip diffraction for flaw sizing and is considered technically superior to the prescriptive methodology of ASME Section V, Article 4. The proposed alternative ultrasonic detection technique uses echo dynamics as an analysis tool which has been validated through performance demonstration. The sizing technique uses tip diffraction, also validated through performance demonstration, which is considered to be more accurate than the method prescribed in ASME Section V, Article 4.

Ultrasonic examinations performed in accordance with ASME Section V, Article 4 require the use of 0°, 45°, 60° and 70° beam angles with recording criteria that are time consuming and require equipment changes that increase personnel radiation exposure without a compensating increase in quality or safety. The use of an Appendix VIII qualified procedure for all RPV shell welds would relieve Duke Energy Corporation's inspection vendor from making equipment changes just to examine one weld with consequent savings in personnel exposure and examination time.

Previous examinations were performed using automated and manual ultrasonic systems in 1993 at McGuire Unit 2, 1994 at Oconee Unit 3, 1993 at Catawba Unit 1 and 1995 at Catawba Unit 2. Coverage for the RPV Flange to Upper Shell Weld was greater than 90% for the volume shown in ASME Section XI, Figure

IWB-2500-4 for Catawba Units 1 and 2 and McGuire Unit 2. Because of interferences from clad patches on the vessel inside surface, coverage for Oconee Unit 3 was 68% from the RPV shell surface using an automated ultrasonic system and 100% from the flange seal surface using manual ultrasonic equipment. Duke Energy Corporation does not anticipate any less coverage than previously reported.

VI Duration of Proposed Alternative:

Duke Energy Corporation proposes to use procedures, personnel and equipment qualified in accordance with ASME Section XI, Appendix VIII, Supplements 4 and 6 to examine the RPV Flange to Upper Shell Weld during the 10-year RPV examinations scheduled for the fall 2004 outages at Catawba Unit 2 and Oconee Unit 3; the spring 2005 outage for McGuire Unit 2 and the spring 2006 outage at Catawba Unit 1.

VII Precedents:

This request for alternative is similar to that approved for Southern California Edison Company for San Onofre Unit 3, on January 15, 2003 (TAC NO. MB6708) and for PSEG Nuclear LLC for Salem Nuclear Station, Unit No. 1 on May 3, 2001 (TAC NO. MB1234).

Sponsored By: James J. McQuillan Date: 7-13-04

Approved By: L. Kevin Rhyme Date: 7/13/04