



**Duke Power Company**

*A Duke Energy Company*

*McGuire Nuclear Station*

MG01VP

12700 Hagers Ferry Rd.

Huntersville, NC 28078-9340

**H. B. Barron**

*Vice President, McGuire*

*Nuclear Generation Department*

(704) 875-4800 OFFICE

(704) 875-4809 FAX

May 23, 2002

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

Subject: Relief Request 02-001  
McGuire Nuclear Station Unit 1  
Docket Nos. 50-369

References: (1) NRC Safety Evaluation Report on Relief  
Request 97-GO-001 Revision 2, dated March 23,  
2002; (2) ASME Code Case N-566-2

Pursuant to 10CFR50.55a(a)(3)(i), Duke Energy Corporation requests the use of an alternative to the 1995 Edition with the 1996 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code (Code). Reference (1) provides information with respect to precedent approval of the alternative. Specific details are described in the attached relief request.

Questions on this matter should be directed to Norman T. Simms, McGuire Regulatory Compliance, at (704) 875-4685.

Sincerely,

H. B. Barron

Enclosure

AD47

U.S. Nuclear Regulatory Commission  
May 23, 2002  
Page 2

cc: Mr. L. A Reyes  
Regional Administrator, Region II  
U. S. Nuclear Regulatory Commission  
Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303

Mr. R.E. Martin, Project Manager (addressee only)  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
One White Flint North, Mail Stop 0-8G9  
11555 Rockville Pike  
Rockville, MD 20852-2738

S. M. Shaeffer  
Senior NRC Resident Inspector  
McGuire Nuclear Station

bxc w/encl: N.T. Simms  
R. Branch (MG01MM)  
G.J. Underwood (EC07J)  
D.E. Caldwell (MG01MM)  
R.K. Rhyne (EC07J)  
J.M. Boughman (EC07J)  
R.D. Klein (MG01MM)  
K.L. Crane  
NRIA File/ELL  
Master File # 1.3.2.13

**ENCLOSURE**

**Relief Request 02-001**

Attachment

DUKE ENERGY CORPORATION

Request for Alternative

ASME Boiler and Pressure Vessel Code, Section XI

**Background:**

Pursuant to 10 CFR 50.55a (a) (3) (i), Duke Energy Corporation requests the use of an alternative to the 1995 Edition with the 1996 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code (Code) for the third inspection interval at McGuire Unit 1.

Duke Energy Corporation requested relief via Request for Relief serial number 97-GO-001, revision 2, and was granted NRC approval via Safety Evaluation Report, Docket No 50-369, dated March 23, 2000, to use an evaluation of the mechanical joint as an alternative to pulling the bolt in the second inspection interval. Since the submittal of that Request for Relief, ASME has published a Code Case that is essentially the same alternative. This Code Case is N-566-2.

**I. Systems/Components for Which Alternative is Requested:**

All Class 1, 2, and 3 systems/components subject to IWA-5000 pressure testing.

**II. Code Requirement:**

Section XI of the ASME Code, 1995 Edition with 1996 Addenda, Subsection IWA-5250(a)(2) states, "If leakage occurs at a bolted connection, on other than a gaseous system, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of the leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100."

**III. Requirement for Which Alternative Is Requested:**

Relief is requested from the requirement to remove the bolt closest to the source of leakage when leakage is detected at a mechanical connection.

**IV. Basis for Requesting Alternative:**

Removal of pressure retaining bolting at mechanical connections for visual, VT-3 examination and subsequent evaluation in locations where leakage has been identified is not always the most discerning course of action to determine the acceptability of the bolting. The Code requirement to remove, examine, and evaluate bolting in this situation does not allow the owner to consider other factors which may indicate the acceptability of mechanical joint bolting.

Other factors that should be considered when evaluating bolting acceptability when leakage has been identified at a mechanical joint include, but are not limited to: joint bolting material, service age of joint bolting materials, location of the leakage, history of leakage at the joint, evidence of corrosion with the joint assembled, and corrosiveness of process fluid.

Performance of the pressure test while the system is in service may identify leakage at a bolted connection that, upon evaluation, may conclude the integrity and pressure retaining ability of the joint is not challenged. It would not be prudent to impact the availability of a safety system by removing the system from service to address a leak that does not challenge the system's ability to perform its safety function.

A situation frequently encountered at Duke Energy Corporation is the complete replacement of bolting materials (studs, bolts, nuts, washers, etc.) at mechanical joints during plant outages. When the associated system piping is pressurized during plant start up, leakage may be identified at these joints. The root cause of this leakage is most often due to thermal expansion of the piping and bolting materials and subsequent fluid seepage at the joint gasket. Proper retorquing of the bolting, in most cases, stops the leakage. Removal of the bolting to evaluate for corrosion would be unwarranted in this situation due to the new condition of the bolting materials.

**V. Alternative Examinations:**

When leakage is identified at bolted connections by Visual, VT-2 examination during system pressure testing, an evaluation will be performed to determine the susceptibility of the bolting to corrosion and to assess the potential for failure as stated in Code Case N-566-2.

The evaluation will consider the following factors:

1. the number and service age of the bolts;
2. bolt and component material;
3. corrosiveness of process fluid;
4. leakage location and system function;
5. leakage history at connection or other system components;
6. visual evidence of corrosion at the assembled connection.

When the evaluation of the above variables is concluded and the evaluation determines that the leaking condition has not degraded the fasteners, then no further action is necessary. However, reasonable attempts to stop the leakage shall be taken.

If the evaluations of the variables above indicate the need for further evaluation, or no evaluation is performed, then a bolt closest to the source of leakage shall be removed and VT-3<sup>1</sup> visually examined. When the removed bolting shows evidence of rejectable degradation, all remaining bolts in the connection shall be removed and VT-3 visually examined. If the leakage is identified when the bolted connection is in service or Technical Specifications require it to be operable, and the information in the evaluation is supportive, the removal of the bolt for VT-3 visual examination may be deferred to the next component/system outage of sufficient duration.

---

<sup>1</sup> The acceptance criteria for Visual, VT-1 will be used to assess the acceptability of the bolting.

**VI. Justification for Granting Alternative:**

The purpose of the Code required corrective action to remove bolts and visually examine them for degradation as stated in IWA-5250(a)(2) is to ensure joint integrity. Section V above provides alternative methods to ensure joint integrity of bolted connections. These alternative methods have been determined to provide an acceptable level of quality and safety.

**VII. Implementation Schedule:**

McGuire Unit 1 is currently scheduled to begin refueling outage EOC15 on September 13, 2002. Duke Energy Corporation requests that approval be granted to permit use of this alternative examination at that time.

**CASE  
N-566-2**

**CASES OF ASME BOILER AND PRESSURE VESSEL CODE**

**Approval Date: March 28, 2001**

*See Numeric Index for expiration  
and any reaffirmation dates.*

**Case N-566-2  
Corrective Action for Leakage Identified at  
Bolted Connections  
Section XI, Division 1**

*Inquiry:* What alternative to the requirements of IWA-5250(a)(2) may be used when leakage is detected at bolted connections?

*Reply:* It is the opinion of the Committee that, as an alternative to the requirements of IWA-5250(a)(2), the requirements of (a) or (b) below shall be met.

(a) The leakage shall be stopped, and the bolting and component material shall be evaluated for joint integrity as described in (c) below.

(b) If the leakage is not stopped, the Owner shall evaluate the structural integrity and consequences of

continuing operation, and the effect on the system operability of continued leakage. This engineering evaluation shall include the considerations listed in (c) below.

(c) The evaluation of (a) and (b) above is to determine the susceptibility of the bolting to corrosion and failure. This evaluation shall include the following:

- (1) the number and service age of the bolts;
- (2) bolt and component material;
- (3) corrosiveness of process fluid;
- (4) leakage location and system function;
- (5) leakage history at the connection or other system components;
- (6) visual evidence of corrosion at the assembled connection.

**For Information Only**