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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Catawba Nuclear Station, Unit 2
Docket Number 50-414
Request for Relief Number 10-CN-001
Alternative Requirements for Temporary Acceptance of a Through-Wall Flaw in Boric Acid Tank Nozzle Weld

Attached is Request for Relief Serial No. 10-CN-001, submitted pursuant to 10 CFR 50.55a(a)(3)(ii), requesting relief from ASME Code, Section XI requirements to perform an immediate repair of a through-wall leak in the Unit 2 Boric Acid Tank Nozzle Mk. M.

Duke Energy plans to perform a Code-compliant repair of the subject weld during the next Unit 2 refueling outage scheduled in the fall of 2010.

If you have any questions concerning this information, please call L.J. Rudy at (803) 701-3084.

Very truly yours,

James R. Morris

LJR/s

Enclosure

A047
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NCMPA-1
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Enclosure

Duke Energy Carolinas, LLC

Catawba Nuclear Station, Unit 2

Relief Request Serial #10-CN-001

Relief Requested in Accordance with 10 CFR 50.55a(a)(3)(ii)

Alternative Requirements for Temporary Acceptance of a Through Wall Flaw in Boric Acid Tank Nozzle Weld

1. ASME Code Component(s) Affected

Catawba Nuclear Station, Unit 2 ASME Class 3 Boric Acid Tank shell nozzle Mk. "M" nozzle-to-shell weld.

The following information is applicable to this component and nozzle:

System:	Chemical and Volume Control (NV)
Design Pressure:	Atmospheric pressure
Design Temperature:	200° F
Shell Material:	SA-240, TP304
Shell Thickness:	¼" Nominal
Nozzle Material:	SA-182, TP304
Nozzle Description:	1" NPS, 3000# Threaded Full Coupling

Nozzle Mk. "M" is located near the bottom of the tank shell and is connected to the tank using a full penetration weld with a ¼" fillet weld reinforcement.

2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda.

3. Applicable Code Requirement

3.1. The ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWD, IWD-3000. IWD-3000 specifies that the rules of IWB-3000 may be used.

3.2. The ASME Boiler and Pressure Vessel Code, Section XI, Subsection IWB, IWB-3522. IWB-3522 specifies acceptance standards for all pressure retaining components. IWB-3522.1 requires that relevant conditions, such as those described in IWB-3522.1(e) [discoloration or accumulated residues on surfaces of components, insulation, or floor areas that may be evidence of borated water leakage] shall require correction to meet the requirements of IWB-3142 and IWA-5250 prior to continued service.

3.3. Because Duke has chosen to use IWB-3522 acceptance standards to address this operational leakage from Boric Acid Tank Nozzle Mk. "M", relief is requested from the requirement of IWB-3522.1 that the relevant condition (through wall leakage) be corrected prior to continued service.

4. Reason for Request

4.1. On April 2, 2010, evidence of leakage was detected at the bottom of Nozzle Mk. "M" on the Unit 2 Boric Acid Tank. This evidence consisted of a very small (approximately 1" diameter) patch of dried boron. Through-wall leakage was confirmed in the nozzle-to-shell weld after the weld was cleaned and reinspected. The leakage rate has been characterized as negligible.

4.2. NRC Inspection Manual, Part 9900 Technical Guidance, Appendix C.12 Operational Leakage From ASME Code Class 1, 2, and 3 Components, states "The NRC staff does not consider through-wall conditions in components, unless intentionally designed to be there such as sparger flow holes, to be in accordance with the intent of the ASME Code or construction code and, therefore, would not meet code requirements, even though the system or component may demonstrate adequate structural integrity."

The guidance provided in Part 9900 implies that the NRC does not accept that IWD-3000 of the ASME Code, Section XI allows through wall leakage in Class 3 components. Duke Energy believes that relief is needed to comply with this guidance.

5. Proposed Alternative and Basis for Use

5.1. In lieu of the requirement of IWB-3522.1 to correct the degraded condition prior to continued service, Duke Energy requests NRC approval to allow continued operation of the Boric Acid Tank until such time that an ASME Code, Section XI repair/replacement activity can be performed in accordance with IWA-4000. The following alternative requirements are proposed:

1. A visual examination of Nozzle Mk. "M" shall be performed weekly during Operations rounds to confirm that the leakage from the nozzle Mk. "M" weld has not increased significantly.
2. If a significant increase in leakage is detected during the visual examination (i.e., boric acid deposit with accumulated volume greater than 1 in^3 over the weekly inspection period or active, visible leakage) an Engineering evaluation shall be performed to confirm the continued structural integrity of the nozzle weld.
3. If the Engineering evaluation determines that the structural integrity of the connecting weld can no longer be assured, the Unit 2 Boric Acid Tank shall be declared "non-functional" and actions would be taken in accordance with applicable licensing commitments.

5.2. Compliance with the requirement of IWB-3522.1 would require that a repair be made to the Boric Acid Tank Mk. "M" nozzle-to-shell weld prior to returning the component to service. Because the flaw was identified during plant operation, compliance with IWB-3522.1 would require that the Boric Acid Tank be immediately removed from service in order to make the necessary repairs. Duke Energy believes that it would be difficult to complete the necessary repairs during plant operation because the Boric Acid Tank will have to be drained and the contents (approximately 42,000 gallons) transferred to temporary storage, which is limited during plant operation. Performing these actions will require the development of temporary procedures because existing procedures do not address draining, transferring and temporary storage of tank contents, and refilling of the Boric Acid Tank from temporary storage during plant operation.

5.3. Duke Energy believes that immediate repair of the nozzle-to-shell weld is not necessary for the following reasons:

1. Nozzle Mk. "M" is used for the installation of a thermowell. As such, the external loads on this nozzle are negligible, and pressure loads are small (approximately 3.6 psi due to internal pressure from the static head of the water in the tank).
2. The stress intensity in the nozzle-to-shell weld from the applied loads is not sufficient to support crack growth in this material, which has a relatively high fracture toughness.
3. Liquid penetrant (PT) and visual examinations were performed on the Mk. "M" nozzle weld on April 6, 2010. The PT examination confirmed the existence of two, 1/16" rounded indications near the 7 O-clock position on the weld. These indications satisfied the ASME Code, Section XI acceptance standards based on their size.
4. All other accessible external welds on the Unit 1 and 2 Boric Acid Tanks were visually examined on April 27, 2010, and evidence of leakage was not detected at

any other locations. The results of these examinations support Duke Energy's position that the through-wall leakage on the Unit 2 Mk. "M" nozzle-to-shell weld is likely the result of a fabrication defect. The indications are small and satisfy the acceptance standards for Section XI surface examination. For these reasons, Duke Energy does not believe that the through-wall leakage is the result of service-induced degradation.

5. The proposed alternative visual examinations are judged sufficient to monitor the leakage from this weld to ensure that flaw growth does not occur. A significant increase in the observed leakage will require an Engineering evaluation to be performed to ensure that the condition does not challenge the structural integrity of the nozzle weld.

5.4. The proposed alternative provides reasonable assurance that the structural and functional integrity of the affected component will continue to be maintained until such time that a code compliant repair/replacement activity can be completed. For the above reasons, Duke Energy believes that the proposed alternative is acceptable and compliance with the requirements of IWB-3522.1 would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety for the Catawba Nuclear Station, Unit 2 Boric Acid Tank.

6. Duration of Proposed Alternative

The proposed alternative shall be used until the affected weld can be repaired during the next scheduled Unit 2 refueling outage during the fall of 2010.

7. References

7.1. US NRC Regulatory Issue Summary 2005-20, Rev. 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety".