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June 9, 2010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas LLC (Duke Energy)
Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos: 50-269, 50-270, and 50-287
Relief Request No. 10-ON-001, Alternative to Volumetric Examination Requirements for the Residual Heat Removal (RHR) Heat Exchanger Class 2 Nozzle-to-Shell Welds

Pursuant to 10 CFR 50.55a(a)(3)(i), Duke Energy requests relief from specific requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda on the basis that the proposed alternatives would provide an acceptable level of quality and safety.

Therefore, Duke Energy submits the enclosed Relief Request 10-ON-001, related to volumetric examination requirements for specific Class 2 nozzle-to-shell welds on the RHR Heat Exchangers. Relief Request 10-ON-001 includes reference (including ADAMS Accession numbers) to a similar request previously approved by the NRC for use at another utility.

Duke Energy requests that the NRC authorize the proposed alternatives under 10 CFR 50.55a(a)(3)(i), and further, requests review and authorization prior to June 15, 2011.

If there are any questions or further information is needed you may contact Randy Todd at (864) 873-3418.

Very truly yours,

for Dave Baxter,
Site Vice President

Enclosure with Attachments (3)

A047
NRR

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Enclosure

Duke Energy Carolinas, LLC

Oconee Nuclear Station, Units 1, 2, and 3

Relief Request Serial #10-ON-001

Request for Alternative in Accordance with 10 CFR 50.55a(a)(3)(i) for Specific Welds on Residual Heat Removal Heat Exchangers

Fourth Inservice Inspection Interval

1. ASME Code Component(s) Affected

Low Pressure Injection (LPI) Residual Heat Removal Heat Exchangers (Decay Heat Coolers).

This request is limited to the following Class 2 tube side inlet and outlet "Nozzle-to-Shell Welds". These welds are subject to the examination requirements of IWC-2500, Table IWC-2500-1, Category C-B, Item C2.32.

Unit 1

Cooler 1A (Tag No. 1LP-C1A, National Board No. 734) Nozzles Mk. "M" and "N"
Cooler 1B (Tag No. 1LP-C1B, National Board No. 735) Nozzles Mk. "M" and "N"

Unit 2

Cooler 2A (Tag No. 2LP-C1A, National Board No. 736) Nozzles Mk. "M" and "N"
Cooler 2B (Tag No. 2LP-C1B, National Board No. 737) Nozzles Mk. "M" and "N"

Unit 3

Cooler 3A (Tag No. 3LP-C1A, National Board No. 738) Nozzles Mk. "M" and "N"
Cooler 3B (Tag No. 3LP-C1B, National Board No. 739) Nozzles Mk. "M" and "N"

Details of these components can be found on drawings referenced in Section 8 of this request.

2. Applicable Code Edition and Addenda

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

3. Applicable Code Requirement

IWC-2500, Table IWC-2500-1, Examination Category C-B, Item C2.32 requires a volumetric examination of the nozzle-to-shell welds when the inside of the vessel is accessible.

4. Reason for Request

Duke Energy plans to remove the Channel Cover from each of the Residual Heat Removal (RHR) Heat Exchangers to permit Eddy Current Examination of the heat exchanger tubes during the current inservice inspection interval at each unit. Because these activities will enable access to the interior of the heat exchangers, a volumetric examination of accessible nozzle-to-shell welds would be required in order to satisfy the requirement of IWC-2500, Table IWC-2500-1, Examination Category C-B, Item C2.32.

Eddy Current Examinations on the RHR Heat Exchangers are scheduled during plant operation (just prior to refueling outages) in order to minimize radiological dose, which is considerably higher during plant shutdown. Dose estimates for performing the required volumetric examinations for all three Oconee Units are 600 to 900 mrem (during plant operation) compared to 4.2 to 6.6 rem (during refueling outages).

Duke Energy believes that performing the volumetric examination of these nozzle-to-shell welds is unnecessary because the proposed alternative provides an acceptable level of safety and quality. The proposed alternative will also eliminate all radiation dose associated with performing these volumetric examinations.

5. Proposed Alternative and Basis for Use

Pursuant to 10 CFR 50.55a(a)(3)(i), the following alternative is proposed in lieu of the volumetric examinations required by IWC-2500, Table IWC-2500-1, Category C-B, Item C.2.32 for the tube side inlet and outlet nozzles of the Residual Heat Removal Heat Exchangers (Decay Heat Coolers).

5.1. Proposed Alternative:

- Surface examinations shall be performed in accordance with IWC-2500, Table IWC-2500-1, Examination Category C-B, Item C2.31, and
- A VT-2 visual examination shall be performed in accordance with IWC-2500, Table IWC-2500-1, Examination Category C-B, Item C2.33, and
- A VT-2 visual examination shall be performed on the RHR Heat Exchangers in accordance with IWC-2500, Table IWC-2500-1, Examination Category C-H, Item C7.10 during each inspection period.

5.2. Basis for Use of the Proposed Alternative:

5.2.1 Westinghouse Owner's group (WOG) performed a study (see Reference 8.1.) as part of the ASME approval process for Code Case N-706. This report provided technical justification for eliminating the volumetric examination of the residual heat removal heat exchangers. The components at Oconee are typical of the heat exchangers described in the WOG report in fabrication, design, inspection requirements and geometric restrictions.

The WOG report also addresses flaw tolerance and risk assessment for these components. Fracture evaluations were performed for the components using finite element models and fracture calculations. It was concluded that the heat exchangers have a large flaw tolerance and that significant leakage would be expected long before any failure occurred. Fatigue crack growth was determined to be extremely slow even in the most highly stressed region. These heat exchangers do not have a severe duty cycle, and there are no known degradation mechanisms applicable to the tube side nozzle-to-shell welds. Therefore, detailed examinations are not required to ensure their integrity.

A risk evaluation was performed using the accepted methodology applied for Risk Informed ISI piping inspection programs. The following conclusions were made:

- Safety equipment required to respond to a potential event is unaffected.
- Potential for loss of pressure boundary integrity is negligible.
- No safety analysis margins are changed.
- Leakage before full break is expected (i.e., there are no core damage consequences associated with leakage).

Thus, elimination of the volumetric examinations required by Table IWC-2500-1, Examination Category C-B, Item C2.32 is expected to result in an insignificant increase in risk. The WOG report indicated that there have been no through-wall

leaks on these components or components of similar design reported in the industry. The WOG report indicated that one US plant (San Onofre Unit 3) had experienced a small leak from the letdown line exiting the Regenerative Heat exchanger, but this was caused by excessive vibration on the piping line and is not an indication of a defect in the heat exchanger.

Duke Energy performed a review of industry operating experience reports and did not identify any through-wall leaks in RHR heat exchangers subsequent to the publication date of the WOG report.

5.2.2 Oconee Selected Licensee Commitment (SLC) 16.6.4 currently limits Low Pressure Injection (LPI) system leakage to 2 gph, and LPI system leakage is periodically monitored. Any system leakage through the tube side inlet and outlet nozzle-to-vessel welds would likely be detected by Operations personnel during plant rounds performed each week and include the LPI Cooler (RHR Heat Exchanger) rooms. Any identified leakage from these welds would be noted and entered into the site corrective action program.

5.2.3 The examinations required by IWC-2500, Table IWC-2500-1, Category C-B, Item C.2.32 are conditional (required only if the interior of the heat exchanger is accessible). Therefore, the level of quality and safety afforded by the proposed alternative is equivalent to that provided by other types of RHR heat exchangers where the interior of the heat exchangers are not considered to be accessible.

5.2.4 The proposed alternative and operator rounds will identify defects resulting in through-wall leakage prior to propagation that results in failure of the component structural integrity.

For the reasons stated above, the proposed alternative provides an acceptable level of quality and safety.

6. Duration of Proposed Alternative

The proposed alternative is requested for use during the following inservice inspection intervals:

Station	Unit	ISI Interval Number	Interval Start Date	Interval End Date (Tentative)
Oconee	1	4	January 1, 2004	July 14, 2014
Oconee	2	4	September 9, 2004	July 14, 2014
Oconee	3	4	January 2, 2005	July 14, 2014

7. Related Industry Relief Requests

7.1. Virginia Electric and Power Company (Dominion), North Anna Power Station Unit 1 Relief Request No. NDE-006, submitted October 7, 2008 (ML082880160), approved August 13, 2009 (ML092230647).

8. References

8.1. Westinghouse Owner's group (WOG) project MUHP 5093, Working Group Inservice Inspection Optimization Action 97-01 (Boiler Code Item BC03-338), "Technical Basis for

Revision of Inspection Requirements for Regenerative and Residual Heat Exchangers," August, 2004.

8.2. Duke Energy Drawings (copies attached):

- #OM-201.00-0286.001, Decay Heat Coolers
- #OM-201.00-3131.002, Channels for Decay Heat Coolers
- #OM-2201.00-0277.001, Decay Heat Coolers

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