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CNS-17-061

December 21, 2017

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)  
Catawba Nuclear Station, Unit 1 and 2  
Docket Numbers 50-413 and 50-414  
Relief Request # 17-CN-001  
Third Ten-Year Inservice Inspection Plan, Limited Volumetric Examinations  
Response to NRC Requests for Additional Information

References: 1. Letter from Duke Energy to the NRC dated May 25, 2017, ADAMS  
Accession No. ML17150A305  
2. Letter from the NRC to Duke Energy dated November 29, 2017, ADAMS  
Accession No. ML17335A097

Reference 1 was submitted for the Catawba Nuclear Station, Units 1 and 2, Relief Request for Third Ten-Year Inservice Inspection Plan, Limited Volumetric Examinations. Reference 2 transmitted Requests for Additional Information (RAIs) from the NRC associated with the relief request.

The purpose of this letter is to formally respond to the RAI questions contained in the November 29, 2017, letter. The enclosure to this letter constitutes Duke Energy's response to the RAIs. The format of the enclosure is to re-state each RAI question, followed by its associated response.

There are no regulatory commitments contained in this letter or its enclosure.

If you have any questions concerning this material, please call Dustin Yang at (803) 701-3084.

Sincerely,

Tom Simril  
Vice President, Catawba Nuclear Station

Enclosure: Requests for Additional Information, Relief Request#17-CN-001

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REQUESTS FOR ADDITIONAL INFORMATION  
RELIEF REQUEST# 17-CN-001  
THIRD TEN-YEAR INSERVICE INSPECTION PLAN  
LIMITED VOLUMETRIC EXAMINATIONS  
DUKE ENERGY  
CATAWBA NUCLEAR STATION, UNITS 1 AND 2  
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RAI-01

Provide wall thickness, operating pressure and temperature for the welds listed in Section 1.0 of Enclosure 1 to this relief request.

**Catawba response:**

**The wall thickness, operating pressure and temperature for the welds listed in Section 1.0 are as follows:**

Weld No.	Description	Nozzle Nominal Wall Thickness	Operating Pressure	Operating Temperature
1NC22-WN7	14" Pressurizer Surge Line	1.406"	2235 PSIG	614.9°F
1NC22-WN8	12" Residual Heat Removal Line	1.125"	2235 PSIG	614.9°F
1NC24-WN9	6" Safety Injection Line	0.718"	2235 PSIG	614.9°F
2NC11-WN7	14" Pressurizer Surge Line	1.406"	2235 PSIG	616.7°F
2NC11-WN8	12" Residual Heat Removal Line	1.125"	2235 PSIG	616.7°F
2NC13-WN9	12" Residual Heat Removal Line	1.125"	2235 PSIG	616.7°F

RAI-02

In the third 10-year ISI interval, were any through-wall leaks identified in the subject Class 1 piping welds during system leakage test conducted in accordance with Examination Category B-P of Table IWB-2500-1?

**Catawba response:**

**In the third 10-year ISI interval, no through-wall leaks were detected on the subject Class 1 piping welds during system leakage tests conducted in accordance with Examination Category B-P of Table IWB-2500-1.**

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RAI-03

Was the UT procedure used for the inservice inspection (ISI) demonstrated on a plant-specific CASS mockup having deep flaws in the outer two thirds of volume of the pipe wall thickness?

**Catawba response:**

**No.** During the previous (second) inservice inspection interval, procedure demonstration using plant-specific CASS mockup having deep inner flaws in the inner one third of volume was attempted unsuccessfully. Subsequently, CNS requested and received relief for this demonstration in Relief Request 04-CN-001, Revision 1 (ADAMS Accession No. ML051230324). During the third inservice inspection interval, calibration was performed using a calibration block made of SA-351 CF8A centrifugally cast stainless steel with axially and circumferentially oriented side-drilled holes.

RAI-04

Given the inability to inspect the required volume C-D-E-F of Figure IWB-2500-8, the inability to qualify the UT procedure and personnel, and the limited coverage of the proposed volume (i.e., less than 50 percent coverage of the outer two thirds of volume), provide the cumulative usage factor based on the actual plant operating cycles for each Class 1 weld listed in this relief request to ensure the structural integrity of unexamined volume of the weld.

**Catawba response:**

**Cumulative Usage Factors (CUF) associated with actual plant operating cycles are not available. However, bounding values of CUFs associated with the total number of design transient events over plant life are reported for each ASME Class 1 weld location below. All CUFs satisfy the acceptance limits of the ASME Section III NB-3600 Code with significant margin.**

Weld No.	Description/Location	Max CUF	Allowable
1NC22-WN7	14" Pressurizer Surge Line / 1B	0.276	1.0
1NC22-WN8	12" Residual Heat Removal Line / 1B	0.044	1.0
1NC24-WN9	6" Safety Injection Line / 1A	0.016	1.0
2NC11-WN7	14" Pressurizer Surge Line / 2B	0.276	1.0
2NC11-WN8	12" Residual Heat Removal Line / 2B	0.044	1.0
2NC13-WN9	12" Residual Heat Removal Line / 2C	0.044	1.0

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RAI-05

NRC report, NUREG/CR-7122 "An Evaluation of Ultrasonic Phased Array Testing for Cast Austenitic Stainless Steel Pressurizer Surge Line Piping Welds" published in March 2012 (ADAMS Accession No. ML12087A061) documents the latest NRC guidance for an effective inspection of CASS components from the OD. Furthermore, ASME Code Case N-824 "Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1" that has been incorporated by reference in 10 CFR 50.55a (by Federal Register Notice 82 FR 32934, dated July 18, 2017 (which became effective on July 18, 2017)) with conditions provides improved requirements for inspecting CASS until a performance demonstration qualification and testing for CASS to be developed.

Discuss whether the licensee has considered implementing ASME Code Case N-824 or using NRC NUREG/CR-7122 guidance to improve the effectiveness of its CASS inspection in the next interval.

**Catawba response:**

**The licensee intends to use ASME Code Case N-824 for future examination of these CASS welds in the next inspection interval.**

RAI-06

The NRC staff notes that in Section 3.5 of this relief request, the licensee requested relief from I-2220 of Appendix I while in Section 4.1, the licensee discussed impracticality of compliance associated with III-2200 of Appendix III.

For consistency and clarification, identify the specific paragraph in the ASME Code, Section XI for which the relief is sought, and discuss impracticality associated with that specific paragraph in the ASME Code, Section XI.

**Catawba response:**

**ASME Section XI (1998/2000A), IWA-2232 requires that ultrasonic examinations shall be conducted in accordance with Mandatory Appendix I. Appendix I, I-2220 (Welds in Piping) requires that "Ultrasonic examination procedures, equipment, and personnel used to detect and size flaws in piping welds shall be qualified by performance demonstration in accordance with Appendix VIII and no other I-2000 requirements apply ." Appendix VIII, VIII-3100 (Qualification Test Requirements) specifies qualification test requirements of performance demonstration for ultrasonic examination systems. VIII-3110 (Detection) subsection (c) reads, "For piping welds whose requirements are in course of preparation, the requirements of Appendix III, as supplemented by Table I-2000-1, shall be met." Since, the requirements for cast austenitic piping welds are in the course of**

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preparation per Table VIII-3110-1, and applicable per VIII-3110 (a), the requirements of Appendix III, as supplemented by Table I-2000-1, apply.

Therefore, relief was requested from the overall requirement to perform a procedure demonstration in accordance with Mandatory Appendix I, I-2220. However, the specifics of the impracticality of compliance is detailed in Mandatory Appendix III due to the relationship of the Mandatory Appendices as described above.