From: Boska, John
Sent: Tuesday, August 14, 2012 4:29 PM
To: Alter, Kent R
Cc: 'Gray, Corey A'
Subject: Oconee Units 1 and 2, NRC Request for Additional Information on Relief Request 11-ON-001, ME8010 to ME8036

Importance: High

By letter dated December 23, 2011, (Agencywide Documents Access and Management System (ADAMS) at Accession Number ML12009A091), Duke Energy Carolinas, LLC (the licensee), submitted Request for Relief (RR) 11-ON-001, Sections 2 through 28, from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components for Oconee Nuclear Station, Units 1 and 2 (ONS 1 and 2). The request for relief applies to the fourth 10-year inservice inspection (ISI) interval, in which the licensee adopted the 1998 Edition through the 2000 Addenda of ASME Code Section XI as the code of record.

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.55a(g)(5)(iii), the licensee has submitted the subject requests for relief for limited examinations in multiple ASME Code Examination Categories. The ASME Code, Section XI, requires that 100 percent of the examination volumes, or surface areas, described in ASME Code, Section XI, Tables IWB-2500 and IWC-2500 be performed during each interval. The licensee stated that 100 percent of the ASME Code-required volumes, or surface areas, are impractical to obtain at ONS 1 and 2.

10 CFR 50.55a(g)(5)(iii) states that when licensees determine that conformance with ASME Code requirements is impractical at their facility; they shall submit information to support this determination. The Nuclear Regulatory Commission (NRC) will evaluate such requests based on impracticality, and may impose alternatives, giving due consideration to public safety and the burden imposed on the licensee.

The NRC staff has reviewed the information submitted by the licensee, and determined the following information is required to complete the evaluation. The questions are found below. The NRC staff requests that a response to the request for additional information would be provided within 45 days of the date of this email.

2.0 REQUEST FOR ADDITIONAL INFORMATION

2.1 General Information Required on Request for Relief 11-ON-001
For all welds in this request of relief, there was a check mark next to “Reject” under the results section on each of the data sheets, regardless whether there were indications detected. Please confirm that this is Duke Energy’s procedure meant only for tracking purposes of examinations that do not meet the requirements of ASME Code Case N-460, Revision 16 “Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1.” If this is not the case, please confirm why all weld examination results are considered rejectable.

2.2 Request for Relief 11-ON-001, Part A, ASME Code, Section XI, Examination Category B-D, Items B3.110 and B3.150, Full Penetration Welded Nozzles in Vessels (ONS 1 and 2)

The licensee has provided only general, and somewhat vague, information regarding impracticality of obtaining ASME Code-required volumetric examinations. For example, the licensee's statement "limitation was caused by the design of the nozzle," is inadequate to describe the basis for not obtaining the ASME Code-required examination volumes.

2.2.1 Please submit detailed and specific information to support the bases for limited examination in all requests for relief in ASME Code, Section XI, Examination Category B-D, and therefore, demonstrate impracticality.
a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences to applied NDE techniques.
b) As applicable, describe NDE equipment (ultrasonic (UT) scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

2.2.2 It is not clear from the information provided in the licensee's submittal which UT wave mode corresponds to each insonification angle for Items B3.110 (ON, Unit 2) and B3.150 (ONS 1). Please clarify the wave modality and insonification angles used for all ultrasonic examinations performed on the pressurizer (PZR) (ONS 2) and letdown cooler (ONS 1) nozzle-to-vessel welds listed in ASME Code, Examination Category B-D.

2.3 Request for Relief 11-ON-001, Part B, ASME Code, Section XI, Examination Category B-J, Item B9.11, Pressure Retaining Welds in Piping (ONS 1 and 2)

2.3.1 Please describe NDE equipment (UT scanning apparatus) and discuss whether alternative methods or ASME Code, Section XI, Appendix VII qualified advanced technologies could be employed to maximize ASME Code coverage.

2.3.2 Please state whether a full surface examination was performed on each of the piping welds and state whether any indications were discovered as a result of the surface examinations on each of the ASME Code, Class 1 piping welds for ONS 2.

2.4 Request for Relief 11-ON-001, Part C, ASME Code, Section XI, Examination Category C-F-1, Items C5.11 and C5.21, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping (ONS 1 and 2)
For ONS 1, the licensee did not provided a description of the limitation for each of the subject welds. Only burden statements were provided of the modifications required to be performed in order to scan all of the ASME Code required volume.

2.4.1 Submit detailed and specific information to support the bases for limited examinations in all welds in ASME Code, Section XI, Examination Category C-F-1 (ONS 1) and therefore, demonstrate impracticality.
a) Include detailed descriptions (written and/or sketches, as necessary) of the interferences to applied NDE techniques.
b) As applicable, describe NDE equipment (UT scanning apparatus), details of the listed obstructions (size, shape, proximity to the weld, etc.) to demonstrate accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

2.4.2 For Pipe-to-Valve Weld 1-51A-04-1C (ONS 1), confirm that the two indications found were acceptable per ASME Code, Section XI criteria.

2.4.3 State whether a full surface examination was performed on each of the Pipe-to-Valve Welds 1LP-251-27 and 2HP-341-V1 (ONS 2) and state whether any indications were discovered as a result of the surface examinations on each of the welds.

2.4.4 The licensee's submittal states that the subject weld areas were interrogated with a combination of 38-, 45-, 60-, and/or 70-degree shear waves, and in some cases, 60- and 70-degree longitudinal waves (L-waves) were applied to detect circumferentially-oriented flaws. The licensee's submittal further states that examinations were performed in accordance with ASME Code, Section XI, Appendix VIII (performance demonstration), and consisted of single-sided examinations.
Confirm the insonification angles and wave modalities used to examine each of the subject welds. Discussions with the industry's Performance Demonstration Initiative (PDI) administrator, the Electric Power Research Institute (EPRI), indicate that Supplement 2 qualifications require refracted longitudinal wave or 70-degree shear wave methods to be applied, as applicable, depending on thickness. If the pipe thickness was equal to or less than 0.50-inches, please explain why 70-degree shear waves were not used. If only shear wave techniques were used to examine the subject stainless steel welds and the pipe thickness was greater than 0.50-inches, please explain why refracted longitudinal wave techniques were not used as part of a "best effort" examination. The L-wave method has been shown capable of detecting planar inside diameter (ID) surface-breaking flaws on the far-side of wrought stainless steel welds. Recent studies recommend the use of both shear and L-waves to obtain the best detection results, with minimum false calls, in austenitic welds. If both shear and L-waves were used please state the "best effort" coverage achieved on the near- and far-side of the subject weld volumes.

(See 1. F.V. Ammirato, X. Edelmann, and S.M. Walker, Examination of Dissimilar Metal Welds in BWR Nozzle-to- Safe End Joints, 8th International Conference on NDE in the Nuclear Industry, ASM International, 1987.
2. P. Lemaitre, T.D. Koble, and S.R. Doctor, PISC III Capability Study on Wrought-to-Wrought Austenitic Steel Welds: Evaluation at the Level of Procedures and Techniques, Effectiveness of Nondestructive Examination Systems and Performance Demonstration, PVP-Volume 317, NDE-Volume 14, ASME, 1995.
3. Anderson, M.T., A.A. Diaz, A.D. Cinson, S.L. Crawford, S.E. Cumblidge, S.R Doctor, K.M. Denslow, and S. Ahmed, 2011. An Assessment of Ultrasonic Techniques for Far-Side Examinations of Austenitic Stainless Steel Piping Welds, NUREG/CR-7113, PNNL-19353, U. S. Nuclear Regulatory Commission,
Washington, DC.)

2.4.5 Below in Table 2.4, is a list of the ASME Code, Section XI, Examination Category C-F-1 welds contained in RR-11-ON-001, that required ASME Code, Section III, acceptance and preservice inspection examinations in accordance with ASME Code, Section XI:

Table 2.4 – ASME Code, Section XI, Examination Category C-F-1

Unit	ASME Code Item	Weld ID	Weld Type
1	C5.21	2-51A-0029-94	Pipe-to-Valve 2HP-139
1	C5.21	2HP-0396-23	Pipe-to-Valve 2HP-140
2	C5.21	2-51A-0029-94	Pipe-to-Valve 2HP-139
2	C5.21	2HP-0396-23	Pipe-to-Valve 2HP-140

Briefly describe the nondestructive examinations that were performed on the subject welds contained in Table 2.4 above during the repair/replacement activities of the subject components,

including examinations for ASME Code, Section III, acceptance and preservice inspection in accordance with ASME Code, Section XI. State whether or not any indications were observed as a result of the ASME Code-required repair/replacement or preservice examinations that could interfere with any future inservice inspection UT examinations.

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