



Scott L. Batson
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP | 7800 Rochester Hwy
Seneca, SC 29672

o: 864.873.3274
f: 864.873.4208

Scott.Batson@duke-energy.com

ONS-2016-050

June 1, 2016

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

10 CFR 50.55a

Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station, Units 1, 2 and 3
Docket Numbers 50-269, 50-270, 50-287
Renewed License Numbers DPR-38, DPR-47, and DPR-55

Subject: Response to Request for Additional Information (RAI) for Oconee Relief Requests
15-ON-002 & 003, Limited Volume Inspections from 1EOC27, 2EOC26 and 3EOC27

Pursuant to 10 CFR 50.55a(g)(5)(iii), Duke Energy submitted Relief Requests 15-ON-002 and 15-ON-003 on July 15, 2015, requesting that the NRC grant relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) with respect to Limited Volume inspections due to the impracticality of inspecting the required volume in the fourth 10-year inservice inspection (ISI) interval. The NRC submitted a Draft Request for Additional Information (RAI) via email dated February 22, 2016 regarding this Relief Request. Duke Energy determined that no clarifications were needed to the draft RAI questions and thus is submitting answers to those RAI questions as an enclosure to this letter.

There are no regulatory commitments associated with this letter.

If there are any questions, or further information is needed, you may contact David Haile in Regulatory Affairs at (864) 873-4742.

Sincerely,

Scott L. Batson
Vice President
Oconee Nuclear Station

Enclosure:

Oconee Nuclear Station Unit 1, 2 and 3, Response to Request for Additional Information (RAI), regarding Relief Requests 15-ON-002 & 003 for Limited Volume Inspections.

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cc :

Ms. Catherine Haney
Administrator Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

Mr. James R. Hall, Project Manager (ONS)
(by electronic mail only)
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Mail Stop O-8B1
Rockville, MD 20852

Mr. Eddy Crowe
NRC Senior Resident Inspector
Oconee Nuclear Station

Enclosure

**Oconee Nuclear Station Unit 1, 2 and 3,
Response to Request for Additional Information (RAI), regarding
Relief Requests 15-ON-002 & 003 for Limited Volume Inspections.**

ONS-2016-050 Enclosure: Response to Request For Additional Information

1. SCOPE (from NRC's RAI document)

By two separate letters dated July 15, 2015 (ML15202A032 & ML15202A052), the licensee, Duke Energy Carolinas, LLC (Duke Energy), submitted Requests for Relief 15-ON-002 and 003 from requirements of the ASME Boiler and Pressure Vessel Code (Code), Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components* for ONS 1, 2, and 3. These requests for relief apply to the fourth 10-year inservice inspection interval, in which ONS 1, 2, and 3 adopted the 1998 Edition through the 2000 Addenda of ASME Code, Section XI.

In accordance with 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 requires that 100 percent of the examination volumes described in Tables IWB-2500 and IWC-2500 be performed during each interval. The licensee stated that 100 percent of the ASME Code-required volumes are impractical to obtain at ONS 1, 2 and 3.

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 U.S. 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.

NRC staff has reviewed the information submitted by the licensee, and based on this review, determined the following additional information or clarification is required to complete the technical evaluation.

2. REQUEST FOR ADDITIONAL INFORMATION

2.1 Requests for Relief 15-ON-002 and 15-ON-003, Examination Category B-A, Item B1.21, Pressure Retaining Welds in Reactor Vessel

RAI Question 2.1.1

The ASME Code states that essentially 100% of the "accessible length" of circumferential head welds must be examined. The licensee stated that approximately 36 percent of the ASME-required volumetric coverage could be obtained on reactor pressure vessel (RPV) transition piece-to-lower head Welds 1-RPV-WR35, 2-RPV-WR35, and 3-RPV-WR35, on ONS 1, 2 and 3, respectively. Schematics have been provided of the RPV lower shell-to-lower head area depicting examination limitations caused by the incore instrumentation nozzles and flow stabilizers. However, it is difficult to determine from the submitted drawings whether the 36 percent obtained is related to the entire weld length, or applies to only the ASME Code "accessible length" of the weld.

Please state the accessible length of each of the RPV circumferential head welds, and clarify whether the 36% volumetric coverage obtained is applicable to the accessible length, or to the entire length of the weld. If applicable to the entire length, and the licensee has completed 100% of the accessible length, relief may not be required.

Duke Energy's Response RAI 2.1.1:

The 36% coverage obtained is applicable to the entire length of the weld. The entire length of each weld was 449.25 inches and the obstruction length was 242.97 inches, leaving 206.28 inch of accessible weld length. The percentage coverage based on accessible length for these welds is also below the 90% minimum required.

2.2 Requests for Relief 15-ON-002, Examination Category B-J, Item B9.11, Pressure Retaining Welds in Piping

RAI Question 2.2.1

Configuration of Weld # 1-PDA1-1: Section 6.4 of 15-ON-002 describes the configuration of the components joined by weld # 1-PDA1-1. This weld joint includes a stainless steel safe end, but the licensee request does not provide any detail on components adjacent to the safe end which might affect the inspectability of the component.

Please clarify the following:

(a) Clarify whether the safe end is welded to adjacent components such as pipe or elbow, and whether the ultrasonic beam will pass through the safe end, adjacent weld, and adjacent component (e.g., pipe or elbow) during inspection of the weld for which relief is requested; and (b) If the ultrasonic beam will pass through adjacent weld and components, identify the materials for the adjacent weld and components, and provide the distance between these components and weld # 1-PDA1-1.

Duke Energy's Response RAI 2.2.1:

- (a) The safe-end is about 2 feet long. On one end, weld 1-PDA1-1 attaches the safe-end to the Reactor Coolant Pump nozzle and on the other end a separate weld attaches the safe-end to an elbow. The weld to the "adjacent component" does not interfere with the inspection of weld 1-PDA1-1.
- (b) The ultrasonic beam only passes through the stainless steel base material (Mat. Spec. A376 Type 316) during the safe-end side of the examination.

RAI Question 2.2.2

Examination Coverage of Weld # 1-PDA1-1: Section 6.4 of 15-ON-002 describes the examination coverage of the component, which is reduced because the cast stainless steel material does not allow meaningful interrogation from the RCP-1A1 side.

Please clarify whether the licensee's best effort ultrasonic examination coverage included the weld root and heat affected zone (HAZ) of base materials typically susceptible to high stresses and potential degradation.

Duke Energy's Response RAI 2.2.2:

The examination utilizes the best-effort ultrasonic techniques for the upper 2/3 of component volume. The procedure uses ultrasonic techniques identified in EPRI Report TR-107481, "Status of the Ultrasonic Examination of Reactor Coolant Loop Cast Stainless Materials." This procedure is a demonstrated procedure as opposed to an ASME Section XI, Appendix VIII qualified procedure.

Note: Refer to NRC Staff Evaluation (Accession Number ML13365A023) regarding approved Relief Request 12-ON-001 and 002 addressing this weld on other pumps.

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RAI Question 2.2.3

UT Performance Qualification and Demonstration: Section 6.4 of 15-ON-002 states that this component was scanned manually with conventional methods, and that the scanning requirements are described in 10 CFR 50.55a(b)(2)(xv)(A)(1).

- (a) Discuss whether the UT used was qualified and demonstrated; and*
- (b) If Appendix VIII was used for the UT performance qualification and demonstration, provided the supplement number.*

Duke Energy's Response RAI 2.2.3:

- (a) The procedure utilized from the Safe-End surface is an ASME Section XI Appendix VIII qualified procedure. The procedure utilized from the pump nozzle surface is a demonstrated procedure.
- (b) The examination from the Safe-End surface is qualified under ASME Section XI Appendix VIII Supplement 2.

The techniques applied to the Safe-End surface have been qualified through the industry's Performance Demonstration Initiative (PDI), which meet ASME Code Section XI, Appendix VIII requirements for flaws located on the near-side of the welds; far-side detection of flaws is considered to be a "best-effort." No ASME Code, Section XI, Appendix VIII requirements currently exist for qualification of ultrasonic examination procedures through cast austenitic materials.

2.3 Editorial Discrepancies Noted in Requests for Relief 15-ON-002 and 15-ON-003

RAI Question 2.3.1

Weld #s 1-LDCB-INLET and 1-LDCB-OUTLET: In Sections 4.4 and 5.4 of 15-ON-002, the diameter of the Letdown Cooler circumferential head welds are listed as 8.75 inches. On page 16 and 29 of Attachment A, the diameters are listed as 8.625 inches. Please clarify the correct diameter.

Duke Energy's Response RAI 2.3.1:

The diameter listed in Sections 4.4 and 5.4 of 15-ON-002 is the outside diameter which is 8.75 inch. The diameter listed on page 16 and 29 of Attachment A of 15-ON-002 is the inside diameter which is 8.625 inch. The Limitation calculation was performed using the inside diameter of 8.625 inch. The inside diameter is the correct value to be applied to the calculation for limitations.

RAI Question 2.3.2

Weld #s 1-LDCB-INLET, 1-LDCB-OUTLET, 3-LDCA-IN-1, and 3-LDCA-OUT-WJ35V: In Sections 4.4 and 5.4 of 15-ON-002 and Sections 5.4 and 6.4 of 15-ON-003, the impracticality section states that in order to scan all of the required volume for these welds, the "shell-to-sampling nozzle" weld would have to be redesigned and replaced. Please clarify whether the correct statement should be the "channel body-to-chemical connector nozzle" weld.

Duke Energy's Response RAI 2.3.2:

The statement should refer to the channel body-to-chemical connector nozzle weld.

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RAI Question 2.3.3

Weld # 2-LDCB-OUT-WJ36V: In Section 15.4 of 15-ON-002, the impracticality section states that the configuration of the “inlet nozzle to the channel body” does not allow interrogation from Surface 2. Please clarify whether the correct statement should be the “outlet nozzle to the channel body.”

Duke Energy’s Response RAI 2.3.3:

The statement should refer to the outlet nozzle to the channel body.

RAI Question 2.3.4

Weld # 2-SGB-W69: In Section 16.4 of 15-ON-002, the component materials are identified as being carbon steel. However, Section 16.5 of 15-ON-002 states that the coverage limitation is “created by the component cast stainless material”. Please clarify and correct as needed.

Duke Energy’s Response RAI 2.3.4:

The component materials are carbon steel ASME SA-508 CL. The statement in Section 16.5 “component cast stainless material” should be changed to “various obstructions from the restraints, trunnions and manway components.”