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June 4, 2012

10 CFR 50.55a

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370
Relief Request Serial # 11-MN-001, Response to Request for Additional Information on Limited Weld Examinations for Refueling Outages 1EOC20 and 2EOC19

By letter dated September 21, 2011, Duke Energy submitted the subject relief request requesting relief from the volumetric coverage requirement for weld examinations specified in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI.

On March 01, 2012, the Nuclear Regulatory Commission (NRC) staff electronically requested additional information regarding this relief request. After further review of the relief request, it was determined that the welds in Sections 3, 15, 16 and 17 no longer require relief, therefore, they can be removed from the 11-MN-001 request. As such, Duke Energy is not including responses to the NRC staff's questions related to these removed sections. Please find enclosed Duke Energy's response to the remaining parts of your request for additional information.

If you have any questions or require additional information, please contact P. T. Vu at (980) 875-4302.

Sincerely,

A D Brewer for

Regis T. Repko

Enclosure

A047
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xc:

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Enclosure

McGuire Nuclear Station Unit 1 and 2

Relief Request 11-MN-001 Request for Additional information (RAI)

1EOC-20 and 2EOC-19 Limited Weld Exam Third interval 10 Year ISI

Duke Energy Response

REQUEST FOR ADDITIONAL INFORMATION

***General Statement on Relief Request 11-MN-001***

Duke Energy Response: Duke Energy hereby withdraws from Relief request 11-MN-001 entire sections 3, 15, 16, and 17 (welds 1ELDHX-HD-FLG, NVFW10-20, NVFW180-46 and NVFW180-45). These welds may be removed from consideration under Relief Request 11-MN-001. As a result, Duke Energy is not providing RAI responses for sections 3, 15, 16, and 17. These sections will be not applicable.

***Question 1:***

*For sections 2, 4, 10, 11, 12, 13, 14, 15, 16, and 17: To determine the level of safety significance for each weld, NRC staff needs to know which system would be impacted by a leak or failure of the weld or welded attachment in question. This information is provided in the enclosures for some, but not all welds. To assist the NRC staff in assessing each weld, please provide a table for all welds in RR sections 2, 4, 10, 11, 12, 13, 14, 15, 16, and 17 that describes the locations of each weld and the systems to which each weld belongs.*

Duke Energy Response: The locations and systems for each weld are presented in the table below:

| Section#/Weld #/Summary No. | Location | System |
|---|---|---|
| Section #2 / 1NC1F-3613-3092 / M1.R1.11.0390 | 14 inch pressurizer surge piping to nozzle on loop 2 hot leg piping and steam generator 1B | Reactor Coolant System |
| Section #4 / 1NV1FW53-27 / M1. R1.11.2170 | 2 inch pipe line to let down orifice outlet isolation valve 1NV-35A. Reference Attachment #1 | Chemical and Volume Control System |
| Section #10 / 2NC2FW39-1 / M2.R1.11.0048 | 1 ½ inch safety injection line to loop 1 cold leg nozzle after reactor coolant pump 2A | Reactor Coolant System |
| Section #11 / 2NC2FW40-11 / M2. R1.11.0049 | 1 ½ inch safety injection line to loop 2 cold leg nozzle after reactor coolant pump 2B | Reactor Coolant System |
| Section #12 / 2NC2FW43-1 / M2.R1.11.0050 | 1 ½ inch safety injection line to loop 3 cold leg nozzle after reactor coolant pump 2C | Reactor Coolant System |

| | | |
|---|---|---|
| Section #13 / 2NV2FW180-1 / M2.R1.11.1566 | 2 X 3 inch reducer to 2 inch seal water injection line to reactor coolant pump 2A, between valves 2NV-28 and 2NV-76 | Chemical and Volume Control System |
| Section #14 / 2NC2FW2-2 / M2. R1.11.1730 | 14 inch pressurizer surge pipe to nozzle on hot leg piping (loop 2) and steam generator 2B | Reactor Coolant System |

***Question 2:***

*For sections 2, 4, 10, 11, 12, 13, 14, 15, 16, and 17 the components are described as being made of stainless steel. For each weld, please specify which components, if any, are made of cast stainless steel.*

Duke Energy Response: The one weld associated with these sections that connects to a component fabricated from cast stainless steel is listed in Section #4 (weld #1NV1FW53-27). The specific component fabricated from cast stainless steel material (ASME SA 351 Grade CF8M) is valve 1NV-35A.

***Question 3:***

*For sections 10 and 16, specify whether welds of similar compositions have had any history of degradation at McGuire 2. If there has been degradation in similar welds, explain why the subject welds is not vulnerable to the same degradation.*

Duke Energy Response: Section #10 is applicable to weld #2NC2FW39-1 (pipe to nozzle). The weld 2NC2FW39-1 is a full penetration butt weld made from Type 308 filler metal and joins a 1 ½ inch SA-376, Type 304 safety injection line to the reactor coolant system loop 1 cold leg nozzle SA-182, Type F304N. There are three other similar welds at McGuire Unit 2, which join safety injection lines to Reactor Coolant System Loops 2, 3, and 4 cold legs. Although thermal fatigue is a degradation mechanism that is applicable to each of these welds, degradation due to thermal fatigue has not been detected in any of these welds.

The welds listed in Sections 10, 11, and 12 are 3 of the 4 welds identified above

**Question 4:**

*For section 2, 4, 13, 14, and 15; The difficulties on obtaining coverage in several welds seem to be caused by the use of fixed-angle probes with a limited range available for scanning. Provide a discussion on alternative examination methods and techniques such as phased-array ultrasonic techniques (line scan or raster) that cover many angles that can be used to obtain greater coverage for welds in sections 2, 4, 13, 14, and 15.*

*Duke Energy Response:* See sections 2.5, 4.5, 13.5, and 14.5 along with sections 2.4, 4.4, 13.4, and 14.4. It is stated in these sections that an alternative is to use Radiography (RT), but RT is not an option because there is no practical access for film placement; therefore, this alternative is impractical. In addition, use of manual or automated Ultrasonic Testing (UT), including phased array techniques qualified under ASME Section XI, Appendix VIII would not increase coverage due to the limitation created by the geometrical configuration of each component.

***Question 5:***

*For sections 3, 5, 6, 7, 8, and 9: No actual alternatives are specified under the "Proposed Alternative and Basis for Use." Specify the requested alternative and basis for use for all sections:*

Duke Energy Response: See sections 5.5, 6.5. 7.5. 8.5 and 9.5. It is stated in these sections that an alternative is to use Radiography (RT), but RT is not an option because there is no practical access for film placement; therefore, this alternative is impractical. In addition, use of manual or automated Ultrasonic Testing (UT), including phased array techniques qualified under ASME Section XI, Appendix VIII would not increase coverage due to the limitation created by the geometrical configuration of each component.

***Question 6:***

*For sections 3, 5, 6, 7, 8, and 9: Specify whether any indications, acceptable or otherwise, were detected during the examinations*

Duke Energy Response: No indications were detected during the examinations of welds in sections 5, 6, 7, 8, and 9. Examination results were recorded on the "UT Vessel Examination" data sheet per the original relief request in Section 5 (Attachment A - page 20 of 24), Section 6 (Attachment B - page 1 of 13), Section 7 (Attachment B - page 14 of 26), Section 8 (Attachment B - page 27 of 39) and Section 9 (Attachment B - page 40 of 43), On each of these data sheets the Indication results document that no indications were detected and therefore are checked as "No".

***Question 7:***

*For section 3; Specify material compositions of the weld and adjoining materials. Was the stainless steel cast?*

Duke Energy Response: Not applicable (see general statement).

***Question 8:***

*For section 3; Specify whether welds of similar composition (carbon steel to stainless steel of the same types) have any history of degradation at McGuire 1. Explain why the subject weld is, or is not, vulnerable to the same degradation.*

Duke Energy Response: Not applicable. (See general statement).

**Question 9:**

*For section 9; Specify the number of similar welds in the system, and the coverage percentages for these should they have been tested as part of the third In-service inspection (ISI) program.*

Duke Energy Response: *Applicable to weld # 2ACSHX-SH-48 (Containment Spray Heat Exchanger 2A).* McGuire Unit 2 does not have any similar welds that are included in the ASME Section XI program ISI scope. McGuire Unit 1 has two similar welds (one on the containment spray heat exchanger 1A and one on the containment spray heat exchanger 1B). Of the two similar Unit 1 welds only one is required to be examined. Both of the Unit 1 and Unit 2 welds had examinations that resulted in similar limited weld coverage and required NRC Code Relief Request due to impracticality. The coverage percentage examined was 22% for the Unit 1 similar weld. Reference previously approved safety evaluations on these identical examinations that required relief request 99-001 (TAC No.MA8090) dated 11/9/2000, Unit 2 and 99-003 (TAC No. MA9034) dated 3-28-2001, Unit 1.

**Question 10:**

*For section 9: Justify how the examined volume can provide assurance regarding the condition of the entire weld-length:*

*a. What has been the operating experience for these welds? Have indications been found in similar welds? Have similar welds required repair/mitigation?*

*b. What would the consequences of these welds failing be? Would the consequences be safety significant, or impact safety systems?*

Duke Energy Response: The cause of the limitation is the existence of support members at 4 specific locations around the periphery of the weld. As such, the entire cross-section of the weld volume was interrogated, but was limited to 23.4% of the weld circumference. Duke Energy believes that because a representative portion of the entire weld volume was examined, any gross degradation of the weld would be detected in the examined locations. Additional assurance of the integrity of the weld is provided by performing periodic system leakage tests and VT-2 visual examinations in accordance with IWC-2500, table IWC-2500-1, Category

Examination C-H. In addition, any obvious degradation of the interior cladding would be detected when the heat exchanger is opened and the interior is accessed for eddy current testing.

10a; No unacceptable indications have been detected in this weld (or similar welds on Unit 1 Containment Spray 1A and 1B Heat Exchangers). Repair/replacement activities have not been performed on any of these welds on the 1A, 1B, or 2A Containment Spray Heat Exchangers. The Unit 2, 2B Containment Spray Heat Exchanger is a different design and does not contain similar welds.

10b: Duke Energy believes that weld failure due to postulated degradation of the stainless steel cladding and localized corrosion of the weld (if it were to occur) would result in leakage that would be detected during plant operation. Upon identification of leakage, the affected train of the Containment Spray System would be isolated and declared inoperable. If the "isolated" train of the Containment Spray System cannot be repaired to restore operability within 72 hours, Technical Specifications require the unit to be in Mode 3 within an additional 6 hours.

Attachment Number 1;

McGuire Flow Diagram MCFD-1554-01.02 rev 11 with weld location identified for Section 4 weld #1NV1FW53-27:

ATTACHMENT
# 1

WELD LOCATION
SECTION #4 TO
RAI 11-MN-001

* UNIT 1 - NV1FW-53-27

NOTES:
1. REMOVE FLOW PLATES FOR SYSTEM FLUSH.
2. LOCATE VENT CLOSE TO CEILING AND VENTILATION EXHAUST DUCT (IF POSSIBLE).
3. LOW POINT OF PIPING.
4. SPRING LOADED CHECK VALVE, 200 PSID.
5. PRESSURIZER LOW LEVEL SIGNAL.
6. HIGH POINT VENTS & DRAINS ADDED BY CONSTRUCTION FOR HYDRO AND FLUSH.
7. LOCATE 1NV8041 AS CLOSE TO THE MISSILE BARRIER AS POSSIBLE.
8. VALVE FAILS WITH FLOW TO VCT.
9. 3-WAY VALVE MUST BE ORIENTED IN PIPING AS SHOWN ON THE FLOW DIAGRAM.
10. CONTROL VALVE ACTUATOR IS DISCONNECTED FROM VI. THEREFORE THE VALVE IS FAILED TO AN OPEN POSITION.
11. VENT AND DRAIN ASSEMBLIES ARE TO BE FABRICATED AND INSTALLED IN ACCORDANCE WITH MCS-1208.00-00-0002 USING ENGINEERING SPECIFICATION MDG-ES-1A,1B,1C AND 1D.
12. INSULATE WHERE NEEDED FOR PERSONNEL PROTECTION.

DESIGN PARAMETERS

| LINE LISTING | PIPE SPEC. | PRESSURE | TEMPERATURE | CLASS | MATERIAL |
|---|---|---|---|---|---|
| NB48 | PS 1501.4 | 30 PSIG | 100 F | E | SS |
| NB63 | TS 2701.1 | 150 PSIG | 100 F | E | ST |
| NC03 | PS 2501.1 | 2485 PSIG | 650 F | A | SS |
| NC06 | PS 2501.1 | 2485 PSIG | 650 F | A | SS |
| NC16 | PS 151.4 | 100 PSIG | 383 F | E | SS |
| ND04 | PS 601.2 | 600 PSIG | 350 F | B | SS |
| NV12 | PS 2501.2 | 2535 PSIG | 650 F | B | SS |
| NV13 | PS 2501.2 | 2485 PSIG | 650 F | B | SS |
| NV14 | PS 2501.1 | 2485 PSIG | 650 F | A | SS |
| NV15 | PS 2501.4 | 2535 PSIG | 650 F | E | SS |
| NV20 | PS 151.4 | 150 PSIG | 225 F | B | SS |
| NV38 | PS 2501.1 | 2485 PSIG | 650 F | A | SS |
| NV31 | PS 2501.2 | 2485 PSIG | 650 F | B | SS |
| NV32 | PS 2501.2 | 2535 PSIG | 650 F | B | SS |
| NV33 | PS 601.2 | 600 PSIG | 383 F | B | SS |
| NV44 | PS 2501.1 | 2485 PSIG | 650 F | A | SS |
| NV45 | PS 2501.2 | 2485 PSIG | 650 F | B | SS |
| NV46 | PS 2501.4 | 2485 PSIG | 650 F | C | SS |
| NV47 | PS 151.4 | 50 PSIG | 200 F | E | SS |
| NV63 | PS 2501.1 | 2535 PSIG | 650 F | A | SS |
| NV64 | PS 1501.2 | 2535 PSIG | 250 F | B | SS |
| NV65 | PS 1501.2 | 2535 PSIG | 100 F | B | SS |
| NV72 | PS 1501.2 | 2485 PSIG | 350 F | B | SS |
| WL01 | PS 151.4 | 100 PSIG | 200 F | C | SS |
| WL03 | PS 151.4 | 30 PSIG | 200 F | C | SS |
| WL43 | TS 2701.1 | 100 PSIG | 200 F | E | ST |

REMOVED CONTAINMENT RELATED

NOTE: DRAWING MCFD-1554-01.02 REPLACES MC-1554-1.2 REV. 18

CONDITION 1 ONLY

FLOW DIAGRAM