

NRR-PMDAPEm Resource

From: Wengert, Thomas
Sent: Thursday, October 26, 2017 3:20 PM
To: Shaw, Jim D.
Cc: Van Der Kamp, David W.
Subject: Cooper Nuclear Station - Final RAI RE: Relief Request RI-21, Revision 1 (CAC No. MF9623)
Attachments: CNS - Draft RAI for RR RI-21 MF9623.pdf

On October 24, 2017, the U.S. Nuclear Regulatory Commission (NRC) staff sent Nebraska Public Power District (NPPD or licensee) the draft Request for Additional Information (RAI) provided below and attached. This RAI relates to Relief Request RI-21, Revision 1, concerning examination coverage of American Society of Mechanical Engineers Code Class 1 and 2 piping welds and vessel related items (threads and welds) at Cooper Nuclear Station.

NPPD subsequently informed the NRC staff that the information requested by the NRC staff was understood and that no additional clarification of the RAI was necessary. NPPD requested that the response date for this RAI be revised to no later than November 30, 2017. The NRC staff informed NPPD that this response date is acceptable. A publicly available version of this final RAI will be placed in the NRC's Agencywide Documents Access and Management System (ADAMS).

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From: Wengert, Thomas
Sent: Tuesday, October 24, 2017 2:55 PM
To: Shaw, Jim D.
Cc: 'Van Der Kamp, David W.' ; Rezai, Ali ; Sydnor, Christopher
Subject: Cooper Nuclear Station - Draft RAI RE: Relief Request RI-21, Revision 1 (CAC No. MF9623)

By letter dated March 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17109A071), Nebraska Public Power District (the licensee) requested relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI requirements at Cooper Nuclear Station (CNS). Relief Request RI-21, Revision 1, concerns examination coverage of ASME Code Class 1 and 2 piping welds and vessel related items (threads and welds) at CNS.

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that additional information, as described in the attached request for additional information (RAI), is required for the staff to complete its review of this relief request.

This RAI is identified as draft at this time to confirm your understanding of the information that the NRC staff needs to complete the evaluation. If the request for information is understood, please respond to this request for additional information within 30 days of the date of this request. Please contact me if you would like to set up a conference call to clarify this request for information.

Regards,

Tom Wengert
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(301) 415-4037

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DRAFT REQUEST FOR ADDITIONAL INFORMATION

RELIEF REQUEST RI-21, REVISION 1, REGARDING WELD EXAMINATION COVERAGE

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

By letter dated March 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17109A071), Nebraska Public Power District (the licensee) requested relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI requirements at Cooper Nuclear Station (CNS). Relief Request RI-21, Revision 1, concerns examination coverage of ASME Code Class 1 and 2 piping welds and vessel related items (threads and welds) at CNS. To complete its review, the Nuclear Regulatory Commission (NRC) staff requests the following additional information for the piping welds listed in this relief request.

RAI-1

In Section 3 of the attachment to the submittal, the licensee categorized the piping welds as Examination Category R-A, Item No. R1.20-1. The NRC staff notes that this categorization does not exist in Table 1 of ASME Code Case N-578-1 "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B, Section XI, Division 1." Revise or justify this categorization.

RAI-2

As documented in the submittal (Section 4 of the Attachment, Section 12.0, and Section 1.0 (Table 1-1) of Appendix 1),

- a. Weld No. RVI-BJ-16B1 was subjected to the ultrasonic testing (UT) during the third 10-year inservice inspection (ISI) interval in 2005, and achieved essentially 100 percent coverage of the required examination volume.
 1. Confirm that Weld No. RVI-BJ-16B1 is a butt weld.
 2. Were there any indications found by UT? If yes, describe.
 3. Confirm that the UT procedures were demonstrated and personnel qualified in accordance with ASME Section XI, Appendix VIII.
- b. Weld No. RVI-BJ-16B1 was subjected to the UT during fourth 10-year ISI interval in 2014. In footnote 1 (Note 1) of the table in Section 12.0 of Appendix 1 (page 70 of 92), the licensee states, in part:

The previous exam from 2005 reported 100 [percent] Code and procedural coverage (full volume). Current exam coverage from 2014 was calculated to be 88.56 percent with a procedural coverage of 85.69

[percent]. The coverage difference appears to be due to the currently qualified procedure, which requires the use of contoured RL probes.

1. Describe the differences between the following percent coverages: (a) "calculated to be 88.56 percent" and (b) "procedural coverage of 85.69 percent." [emphasis added]
 2. Provide justification for claiming coverage of 88.56 percent rather than coverage of 85.69 percent (refer to Section 1.0 and 12.0 of Appendix 1) in the fourth 10-year ISI interval.
 3. Describe the differences between "Code Coverage" and "Procedural Coverage."
 4. Confirm that the UT procedures were demonstrated and personnel qualified in accordance with Section XI, Appendix VIII.
- c. In Section 12.0 of Appendix 1 of the relief request, Weld No. RVI-BJ-16B1 is identified as Examination Category R-A, Item No. R1.20 (element not subject to a damage mechanism). In Table 1-1 of Appendix 1 of the relief request, Weld No. RVI-BJ-16B1 is described as SB-166 (Inconel) nozzle and welded to SA-182 (stainless steel) safe end with Inconel 182 weld metal.

The NRC staff notes that Inconel 182 is known to be susceptible to the intergranular stress corrosion cracking (IGSCC). Justify this categorization.

- d. The NRC staff notes that NRC NUREG-0313 "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," Revision 2 (ADAMS Accession No. ML031470422), categorizes (e.g., Category A through G) a weld based on degrees of susceptibility to IGSCC, depending on the materials and processing involved. What is the categorization (e.g., Category A through G) of Weld No. RVI-BJ-16B1 with respect to NUREG-0313?
- e. The NRC staff notes that, as stated on page 4 of 92 of the attachment to the submittal, there are four reactor vessel (RV) instrument penetration nozzle-to-safe-end butt welds identified in this relief request. In accordance with the CNS Risk-informed (RI)-ISI program, one of these four welds was selected for inspection in the fourth 10-year interval.
1. Did the licensee inspect any of these four welds during the third 10-year interval? If yes, discuss the results of the inspections.
 2. Was any through-wall leakage identified in any of these four welds during fourth 10-year ISI interval?

RAI-3

Provide the operating pressure and temperature for each piping weld in this relief request.

RAI-4

For several of the RPV nozzle welds addressed in RI-21, Rev. 1, the licensee reported limited scope examination coverages that had decreased from those that were previously approved by the NRC for an earlier version of this fourth ISI interval relief request. Specifically, in its safety evaluation dated January 12, 2010 (ADAMS Accession No. ML093521350), for Relief Request No. RI-21, Rev. 0, dated February 16, 2009 (ADAMS Accession No. ML090540420), the NRC staff granted relief for limited-scope examinations for several of the RPV nozzle welds that are now addressed again in RI-21, Rev. 1, with lower reported coverages. The limited scope exams that were previously approved for the fourth ISI interval are identified in Table 1 below.

The 2009 submittal for RI-21, Rev. 0 states that CNS performed the limited scope reactor pressure vessel (RPV) nozzle examinations using the alternative examination volume defined in Code Case N-613-1. Since both Rev. 0 and Rev. 1 of RI-21 reported the use of Code Case N-613-1, the NRC staff could not determine the reason for the decrease in the limited-scope examination coverages. In addition, for RPV nozzle welds identified in Table 1 below that were not previously approved in RI-21, Rev. 0, the staff could not determine how the application of Code Case N-613-1 for the fourth ISI interval would result in lower exam coverages than those reported for the third ISI interval. Therefore, please explain how the coverages for the fourth ISI interval limited examination were determined for the subject RPV nozzle welds, as detailed in Table 1 and Parts "a" through "d" below:

Table 1 – Changes in Reported Coverage for Item No. B3.90 RPV Nozzle Welds

Component ID	Limited-Scope Exam Coverage Reported in RI-21, Rev. 1	Was 4th Interval Relief Previously Requested/Approved per RI-21, Rev. 0? (Yes or No)	Previously Approved Limited-Scope Coverage per RI-21, Rev. 0	Information Needed for Review of RI-21, Rev. 1
Recirculation Outlet, NVE-BD-N1A	25.76 percent	Yes	46 percent	Parts (a), (b)
Recirculation Inlets, NVE-BD-N2E NVE-BD-N2H NVE-BD-N2K NVE-BD-N2C NVE-BD-N2F NVE-BD-N2G NVE-BD-N2J	37.36 percent 37.36 percent 37.36 percent 37.36 percent 37.36 percent 37.36 percent 37.36 percent	Yes Yes Yes No No No No	55 percent 55 percent 55 percent N/A N/A N/A N/A	Parts (a), (b) Parts (a), (b) Parts (a), (b) Part (c) Part (c) Part (c) Part (c)
Main Steam Outlet, NVE-BD-N3A	27.85 percent	Yes	49 percent	Parts (a), (b)
Reactor Feedwater, NVE-BD-N4A NVE-BD-N4B NVE-BD-N4C NVE-BD-N4D	36.8 percent 39 percent 36.8 percent 39 percent	No No No No	N/A N/A N/A N/A	Part (c) Part (c) Part (c) Part (c)
Core Spray Inlet NVE-BD-N5A	31.05 percent	Yes	51 percent	Parts (a), (b)
Top Head Spray NVE-BD-N6B	18.52 percent	No	N/A	Part (c)
Top Head Vent NVE-BD-N7	59.09 percent	No	N/A	Parts (c), (d)
Control Rod Drive (CRD) Return NVE-BD-N9	37.48 percent	No	N/A	Part (c)

- a. For those RPV nozzle weld exam limitations that were previously approved per RI-21, Rev. 0, please state whether the actual UT that achieved the limited coverages reported in RI-21, Rev. 1 are the same as those previously addressed in RI-21, Rev. 0. Specifically, were the new reduced examination coverages addressed in RI-21, Rev. 1 determined exclusively by recalculation?
- b. If the changes to the RPV nozzle weld limited coverages from RI-21, Rev. 0 to RI-21, Rev. 1 were determined exclusively by recalculation, please explain whether the recalculated limited examination coverages for RI-21, Rev.1 were based on:
 - (1) Changes to the definition of the full scope (i.e., 100 percent) exam volume, as specified in Figure IWB-2500-7 of the Code vs. ASME Code Case N-613-1; or
 - (2) changes to the methodology used for crediting and/or determining the achieved coverage; or
 - (3) a combination of (1) and (2).

For example, Section 2.0 of Appendix 1 of the attachment to RI-21, Rev. 1 reports "25.76" percent as the limited scope examination coverage of RPV Nozzle Weld NVE-BD-N1A, which is a reduction from the previously approved RI-21, Rev. 0 coverage of "46" percent. However, it is not clear whether the 25.76 percent limited-scope coverage in Rev. 1 is based on the full scope (100 percent) exam volume specified Figure IWB-2500-7 (i.e., Exam Volume "A-B-C-D-E-F-G-H-I") of Table IWB-2500-1 of the ASME Code, Section XI or the alternative reduced examination volume specified in ASME Code Case N-613-1, Figure 1 (i.e., Exam Volume "A-B-C-D-E-F-G-H"), and/or whether there was a change in methodology for crediting actual coverage. Please clarify this issue for all limited RPV nozzle weld exams that were previously approved in RI-21, Rev. 0 so that the NRC staff can accurately determine the basis for the changes in limited coverages addressed RI-21, Rev. 1.

- c. The NRC staff identified that relief was not previously requested or approved in RI-21, Rev. 0 for the reactor feedwater nozzles, top head spray nozzle, top head vent nozzle, CRD return line nozzle, and several of the recirculation inlet nozzles. For these nozzle weld exams, please explain how the application of Code Case N-613-1 for the fourth ISI interval would result in lower exam coverages than those reported for the third ISI interval, given that the full scope (100 percent) exam volume per the Code Case is lower than that required by Figure IWB-2500-7 of the Code. The response to this part should also address any other reasons for a reduction in examination coverage from third to fourth ISI interval not related to Code Case N-613-1 (e.g., such as corrective action for crediting excessive exam coverage, similar to issues raised in RAI-5).
- d. For the top head vent nozzle, there are inconsistencies in the discussion of the third ISI interval examination coverages in Section 8.0 of Appendix 1 of the attachment to RI-21, Rev. 1. Specifically, the table in this section specifies a third ISI interval examination coverage of "58.6" percent in 1998, whereas the "Note 1" text beneath the table states that previous exams from 1995 and 2001 reported a coverage of "92.25" percent. Please clearly state the actual third ISI interval examination coverage and the corresponding calendar year when this exam was performed.

RAI-5

For several of the Class 1 RPV and Class 2 Residual Heat Removal heat exchanger items addressed in RI-21, Rev. 1, the licensee reported that fourth ISI interval examination coverages had decreased from those reported for the third ISI interval because the third ISI interval exam coverages did not properly account for certain scanning obstructions, access restrictions, or other issues, which resulted in excessive amounts of coverage credited during the third interval.

- a. Please identify whether the CNS ISI procedures specifically provide for accurate accounting of scanning obstructions, access restrictions, or other design/configurational issues that would result in limited exam coverages.
- b. For cases where plant design and/or configurational issues preclude achieving the full-scope exam coverage, please identify whether the CNS ISI procedures specifically ensure that examination coverage is accurately determined and credited, based on the documented scan limitations and qualified UT techniques, including applicable Performance Demonstration Initiative requirements of the ASME Code, Section XI, Appendix VIII, as conditioned by 10 CFR 50.55a.