

NRR-PMDAPEm Resource

From: James, Lois
Sent: Tuesday, September 15, 2015 1:54 PM
To: Shaw, Jim D.
Cc: Lingam, Siva
Subject: Request for Additional Information - Relief Request for RR5-01, Cooper - TAC No. MF6332
Attachments: MF6332 -EVIB - Cooper FSWOL RAI.docx

Jim,

By letter dated June 9, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15167A066), Nebraska Public Power District (NPPD) proposed an In-service Inspection (ISI) Alternative to install a full structural weld overlay (FSWOL) on one weld at Cooper Nuclear Station (CNS) during the Refueling Outage 29 (which is projected to occur during the 5th ten-year ISI interval).

The NRC staff's Vessel & Internals Integrity Branch (EVIB) has completed its initial review of the licensee's proposed relief request for CNS. Based on our review, the NRC staff has identified the attached request for additional information (RAI) for completing its review.

Draft RAIs were transmitted via e-mail on August 26, 2015, and no clarification call was needed or held. Jim Shaw of NPPD agreed to provide the RAI response within 45 days from the date of this e-mail. Please treat this e-mail as formal transmittal of RAI.

Respectfully,

Lois M. James
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Tracking Status: None
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REQUEST FOR ADDITIONAL INFORMATION RELIEF REQUEST NO. RR5-01
ALTERNATE WELD OVERLAY REPAIR FOR A DISSIMILAR METAL WELD JOINING NOZZLE
TO CONTROL ROD DRIVE END CAP
COOPER NUCLEAR STATION
NEBRASKA PUBLIC POWER DISTRICT
DOCKET NO. 50-298

By letter dated June 9, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15167A066), Nebraska Public Power District (NPPD) proposed an In-service Inspection (ISI) Alternative to install a full structural weld overlay (FSWOL) on one weld at Cooper Nuclear Station (CNS) during the Refueling Outage 29 (which is projected to occur during the 5th ten-year ISI interval). The licensee intends to use relief request RR5-01 only as a contingency in the event that a flaw is discovered during Refueling Outage 29 in a control rod drive nozzle to cap weld resulting in the need for a FSWOL. CNS currently has no weld overlays installed. To complete its review, the U.S. Nuclear Regulatory Commission (NRC) staff requests following additional information.

RAI-1:

In the submittal dated June 9, 2015, the licensee proposed to use Code Case N-638-4 with the Conditions that "Demonstration for ultrasonic examination of the repaired volume is required using representative samples which contain construction type flaws" and that "CNS will comply with 3(e)(1) of the code case." NRC staff notes that paragraph 2.1(j) of the code case states:

"The average lateral expansion value of the three HAZ Charpy V-notch specimens shall be no less than the average lateral expansion value of the three unaffected base metal specimens. However, if the average lateral expansion value of the HAZ Charpy V-notch specimens is less than the average value for the unaffected base metal specimens and the procedure qualification meets all the other requirements of this Case, either of the following shall be performed:

- (1) The welding procedure shall be requalified.
- (2) An Adjustment Temperature for the procedure qualification shall be determined in accordance with the applicable provisions of NB-4335.2 of Section III, 2001 Edition with 2002 Addenda. The RT_{NDT} or lowest service temperature of the materials for which the welding procedure will be used shall be increased by a temperature equivalent to that of the Adjusted Temperature."

Based on the above information, the staff requests that the licensee provide the following information:

- (a) Identify whether aforementioned option (1) or option (2) was used in the temperbead weld qualification for Cooper weld overlays.
- (b) If the welding procedure specification (WPS) was qualified with option (2), provide the value for the new Adjusted Temperature for the vessel component (where temperbead structural overlay is to be applied). Identify if this Adjusted Temperature value was considered in the evaluation of the vessel integrity analyses (e.g., pressure-temperature curves-if applicable).

RAI-2:

In the submittal dated June 9, 2015, the licensee proposed to use Code Case N-638-4 with the Conditions that "Demonstration for ultrasonic examination of the repaired volume is required using representative samples which contain construction type flaws" and that "CNS will comply with 3(e)(1) of the code case." NRC staff notes that paragraph 2.1(c) of the code case states:

"Consideration shall be given to the effects of irradiation on the properties of material, including weld material for applications in the core belt line region of the reactor vessel. Special material requirements in the Design Specification shall also apply to the test assembly materials for these applications."

NRC staff notes that Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix G, Section II.G defines the beltline region of reactor vessel as:

"the region of the reactor vessel (shell material including welds, heat affected zones, and plates or forgings) that directly surrounds the effective height of the active core and adjacent regions of the reactor vessel that are predicted to experience sufficient neutron radiation damage to be considered in the selection of the most limiting material with regard to radiation damage."

NRC staff notes that Regulatory Issue Summary (RIS) 2014-11 defines the beltline as follows:

"the beltline definition in 10 CFR Part 50, Appendix G is applicable to all reactor vessel ferritic materials with projected neutron fluence values greater than 1×10^{17} n/cm² (E>1 MeV), and this fluence threshold remains applicable for the design life as well as throughout the licensed operating period."

Based on the above information, the staff requests that the licensee provide the following information:

- (a) Identify whether or not the subject weld joint is considered to be in the beltline region per the definitions of 10 CFR Part 50 Appendix G and RIS 2014-11.
- (b) If the subject weld joint is considered to be in the beltline region as defined by 10 CFR Part 50 Appendix G and RIS 2014-11, identify what consideration was given to the effect of

irradiation on the properties of material, as required by paragraph 2.1(c) of Code Case N-638-4.

RAI-3:

In the submittal dated June 9, 2015, the licensee states that the current configuration of the subject weld joint is an “A-508, Class 2 low alloy steel nozzle” joined to an “SB-166, Alloy 600 nickel alloy cap” with “Alloy 182/82 materials”. The licensee proposed to perform the FSWOL welding using “ERNiCrFe-7A (Alloy 52M) filler metal.” Later in the submittal, the licensee states that the “overlay will completely cover the area of the flaw and other Alloy 182 or susceptible austenitic stainless steel material with the highly resistant Alloy 52M weld filler material.”

Based on the above information, the staff requests that the licensee provide the following clarification:

- (a) Identify whether alloy 82 or 182 is used in the final layer of the existing weld joint to which the FSWOL is proposed to be applied.
- (b) Clarify whether or not austenitic stainless steel material is used in the existing weld joint to which the FSWOL is proposed to be applied. If austenitic stainless steel material is used in the existing weld joint, provide a detailed weld sketch identifying all the following materials: A-508 Class 2, Stainless Steel (specify type), SB-166 Alloy 600, Alloy 82 filler metal, and Alloy 182 filler metal.

RAI-4:

Provide a sketch or diagram of each subject weld that is applied with a FSWOL demonstrating that the ultrasonic examination of the overlaid weld will achieve 100 percent coverage of the required volume per the ISI alternative. The sketch/diagram should include lines that represent the ultrasonic beam angles and signal path that cover the required volume.