



## Nebraska Public Power District

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NLS2008042  
April 11, 2008

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

**Subject:** Response to Request for Additional Information Regarding 10 CFR 50.55a  
Request RI-35, Revision 1  
Cooper Nuclear Station, Docket No. 50-298, DPR-46

- References:**
1. Letter from Carl F. Lyon, U. S. Nuclear Regulatory Commission, to Mr. Stewart B. Minahan, Nebraska Public Power District, dated April 7, 2008, "Cooper Nuclear Station – Request for Additional Information Re: Relief Request RI-35 (TAC No. MD8025)"
  2. Letter from Stewart B. Minahan, Nebraska Public Power District, to the U. S. Nuclear Regulatory Commission, dated March 27, 2008, "Response to Request for Additional Information Regarding 10 CFR 50.55a Request RI-35, Revision 0, and Submittal of RI-35, Revision 1"

Dear Sir or Madam:

The purpose of this letter is for the Nebraska Public Power District (NPPD) to submit a response to the Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) dated April 7, 2008 (Reference 1). The additional information requested by the RAI is in support of the NRC review of the 10 CFR 50.55a request (RI-35, Revision 1) for the Cooper Nuclear Station (CNS) submitted by letter dated March 27, 2008 (Reference 2). The 10 CFR 50.55a request submitted by Reference 2 was a request to use alternatives to the dissimilar metal weld requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

The response to the RAI is provided as Attachment 1. Approval of RI-35, Revision 1 is requested as soon as practicable in order to support weld repair work, if needed, for Refueling Outage 24. Based on discussions with the NRC Project Manager for CNS, verbal approval can be issued if needed, provided that the request is justified.

Should you have any questions regarding this submittal, please contact David Van Der Kamp, Licensing Manager, at (402) 825-2904.

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A047  
NRR

Sincerely,



Stewart B. Minahan  
Vice President-Nuclear and  
Chief Nuclear Officer

/dm

Attachment

cc: Regional Administrator w/ attachment  
USNRC - Region IV

Cooper Project Manager w/ attachment  
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/ attachment  
USNRC - CNS

Nebraska Health and Human Services w/ attachment  
Department of Regulation and Licensure

NPG Distribution w/o attachment

CNS Records w/ attachment

**Attachment 1**

**Response to Request for Additional Information (RAI)  
 Related to Relief Request RI-35, Revision 1**

**Cooper Nuclear Station (CNS), Docket No. 50-298, DPR-46**

*The Nuclear Regulatory Commission (NRC) staff has reviewed the Nebraska Public Power District (the licensee)[NPPD] March 27, 2008, Response To Request For Additional Information regarding Request RI-35, Revision 1 for the Cooper Nuclear Station (CNS) and has determined that additional information is necessary to complete the review of their request for relief. Based on the staff's review, please provide a response which addresses the following request for additional information questions.*

1. NRC Request

*The licensee has stated that the weld overlay of the dissimilar metal welds may require welding on more than 300 square inches of surface on some of the materials shown in Table 1 of Request Number RI-35, Revision 1. Provide sketches and calculations to justify the basis for the maximum surface area of weld overlay for Component Numbers RAS-BF-1, RBS-BF-1 and RAS-BF-12 shown in Table 1 of Request Number RI-35, Revision 1.*

NPPD Response

The following table is provided in lieu of sketches and calculations. The design rules require that the weld overlay extend a sufficient distance on either side of the defect location to provide for effective load transfer across the defect location. The repair length on the safe end side and the nozzle side will be extended to provide sufficient access to allow for ultrasonic testing examination of the repair and underlying volume. Based on the nominal diameters and the calculated size of the repair, the minimum required areas for each side of the flaw are summarized below. The maximum areas include some additional margin:

Nozzle	Nominal OD (in)	WOL Circumference <sup>1</sup> (in)	Minimum WOL Length <sup>2</sup> (in <sup>2</sup> )	Minimum WOL Area <sup>3</sup> (in <sup>2</sup> )	Maximum <sup>4</sup> WOL Area (in <sup>2</sup> )
RAS-BF-1	29.0625	91.3	4	365.2	420
RBS-BF-1	29.0625	91.3	4	365.2	420
RAS-BF-12	20	62.8	2.5	157	180

Note 1: Circumference = OD x  $\pi$

Note 2:  $L = 0.75\sqrt{Rt}$  where L is the full thickness length of the repair on each side of the observed weld. Note the length is rounded up.

Note 3: Area= circumference x length

Note 4: Maximum area is based on minimum area required plus a 15% margin.

2. NRC Request

*In Table 1 of Request Number RI-35, Revision 1, and "Material 1" for several components is shown as "Nozzle: A-508 Class 2 CS." This implies that ASME SA-508 Class 2 is a carbon steel material (P-1 material). This is incorrect. ASME SA-508 Class 2 is a low alloy steel material (P-3 material). As this clarification is important with respect to the qualification of the welding procedure which will be used to apply the weld overlay, please correct this discrepancy.*

NPPD Response

NPPD did not intend any confusion in using the CS suffix for A-508 Class 2 material. NPPD used it to clarify that the nozzle material is different from the stainless steel safe end. NPPD concurs that this material is P-3 (low alloy steel) per ASME Section IX.

3. NRC Request

*In Table 1 of Request Number RI-35, Revision 1, one of the materials to be welded is shown as, "Pipe: A-155 Class 1 CS." NRC cannot find a material with this class of A-155. Please identify the material designation of this material, including material type or class and year of this designation. As noted above, documentation of this information is significant with respect to ensuring proper qualification of the welding procedure which will be used to apply the weld overlay.*

NPPD Response

A-155 is an older standard for electric-fusion-welded steel pipe suitable for high-pressure service for use at high, intermediate, or low temperatures. The class 1 designation means that the pipe was required to be heat treated and radiographed. The grade is KC-70. This material specification was annulled by the ASME in 1980 and was replaced by SA-671, SA-672, or SA-691. The use of A-155 Class 1 was allowed by the construction code, ANSI B31.1-1967. A copy of the material specification (circa 1976) can be obtained directly from ASME.

4. NRC Request

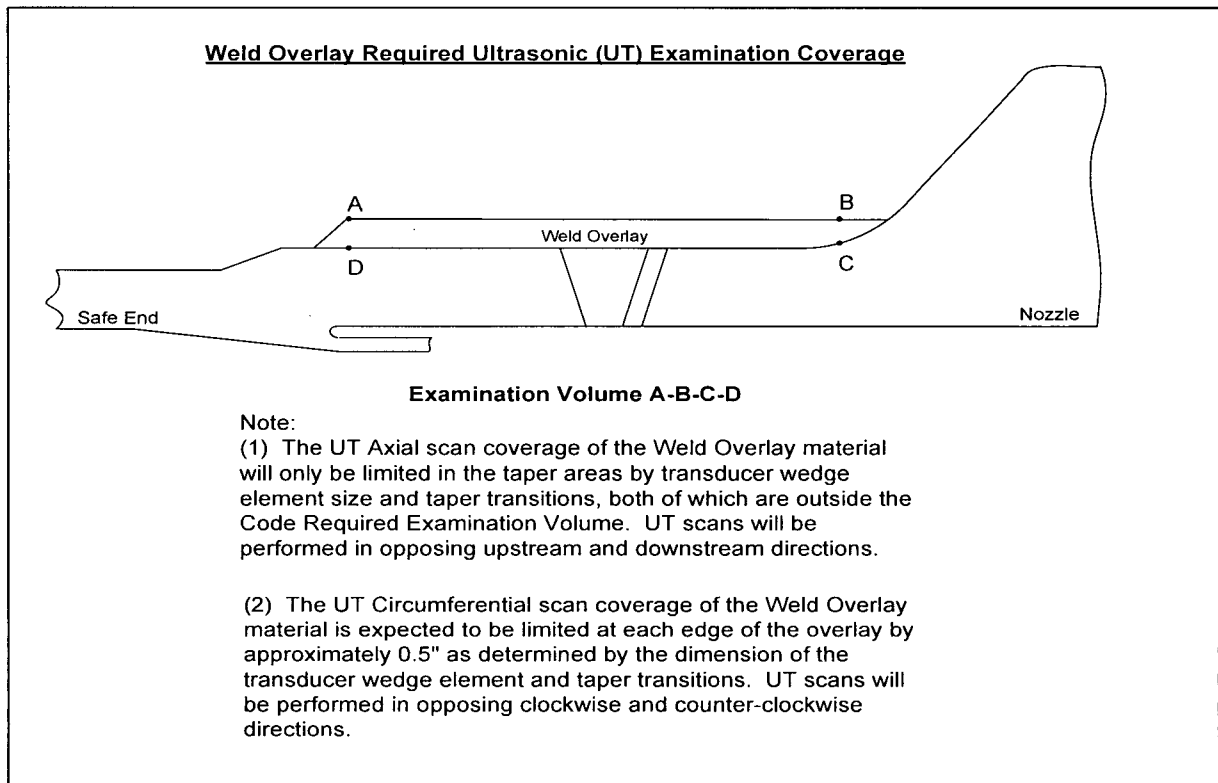
*The relief request states that full ultrasonic examination of the final weld surface and band area (1.5T width) will not be performed. Provide a sketch similar to Figure 1 in RI-35 to describe how much of the final weld surface and band area will be post-weld examined using the ultrasonic method and how much of the final weld surface and band area will be examined by the liquid penetrant method. Provide a detailed explanation for the basis that the liquid penetrant method can be substituted for the ultrasonic method in areas where the ultrasonic method will not be used.*

NPPD Response

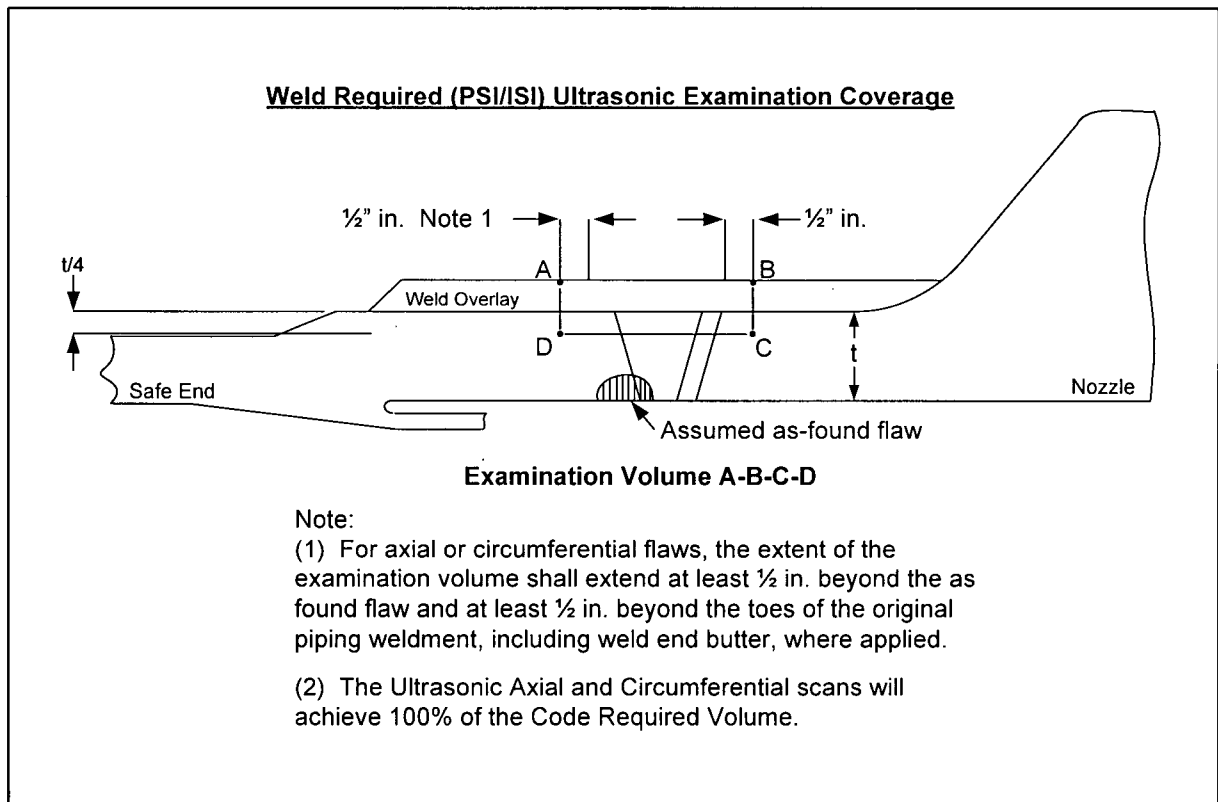
Full ultrasonic examination of the 1.5T band will not be possible due to geometric interferences. The ultrasonic examination may not extend up to the very edge of the overlay. The weld overlay will extend into the blend radius of the nozzle for structural reinforcement. This extension into the blend radius eliminates a stress riser on the nozzle and may provide additional surface area for ultrasonic examination of the defect area in the original weld. Figures 1 and 2 identify the extent of coverage expected for scans in the circumferential and axial directions. The full WOL surface will be scanned.

Because this is a surface application of a temperbead welding process (specifically performed to minimize heat input into the ferritic steel nozzle), there is minimal impact to the volume of the ferritic shell nozzle material in the area surrounding the weld overlay. Also, no additional useful information can be gained by a volumetric examination of the area beyond the physical boundaries of the weld overlay. The weld and heat affected zone beneath the weld overlay will be volumetrically examined after welding to ensure that sound weld metal has been deposited and that the process did not introduce flaws into the base material. Surface examinations of the weld overlay surface will be performed (See Figure 3 for the examination area). This is sufficient to verify that defects were not introduced in either the ferritic steel nozzle or stainless steel safe-end due to welding.

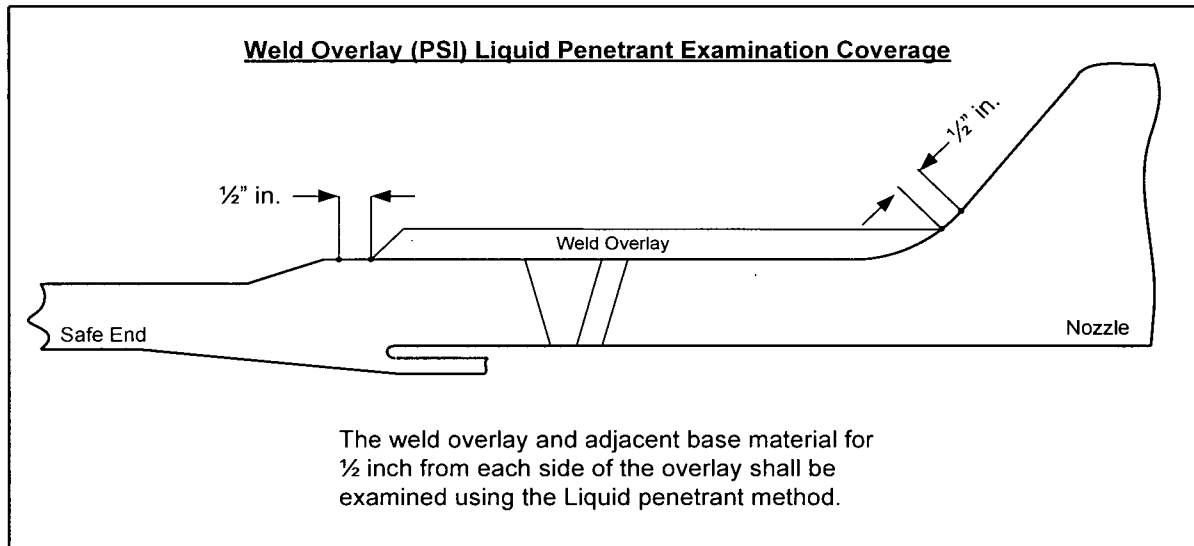
Later editions of Section XI as well as Code Case N-638-2 have deleted the requirement for the 1.5T examination band for both ultrasonic examination and surface examination. This is consistent with the less restrictive requirements for ultrasonic examination of the ferritic nozzle because hydrogen cracking away from the temper bead weld is not considered a concern. The nondestructive examination (NDE) requirements in these documents apply to any type of welding where a temperbead technique is to be employed (which includes weld repairs of excavated flaws) and is not specifically written for weld overlay. For the weld overlay type of repair, any ferritic steel base material cracking would occur in the HAZ directly below or adjacent to the weld overlay and not in the 1.5T examination band of ferritic material beyond the edges of the weld overlay. If this type of cracking occurs it will be detected by the NDE of the weld overlay and adjacent ferritic steel surfaces as described in the relief request and non-mandatory Appendix Q.



**Figure 1**



**Figure 2**



**Figure 3**

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The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None	N/A	N/A