



Nebraska Public Power District

NEBRASKA PUBLIC POWER DISTRICT
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Vice-President, Nuclear
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NLS940084
December 23, 1994

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

Subject: Exemption Request - 10 CFR 50.55a(a)(2)
HPCI Turbine Exhaust Line Pressure Boundary
Cooper Nuclear Station
NRC Docket No. 50-298, License No. DPR-46

Gentlemen:

Per the requirements of 10 CFR 50.55a(a)(3), the Nebraska Public Power District (District) is requesting a permanent exemption for the weld located between a 24" high pressure coolant injection (HPCI) turbine exhaust line and 10" branch line at Cooper Nuclear Station (CNS). This exemption, if granted, would provide relief from the requirements of 10 CFR 50.55a(a)(2) and ASME Section XI, IWA-4120 for the specific weld in question. This ASME section requires that repairs shall be done in accordance with the Owner's Design Specification and Construction Code of the component or system.

In 1983, a modification was performed on the HPCI turbine exhaust line pressure boundary, located inside of primary containment at CNS. During this modification, the subject weld was installed as a fillet weld, as opposed to a full penetration weld as required by ASME Section III, Subsection NC, Paragraph NC-4240. As demonstrated in Attachment 1, the District has evaluated the existing weld and has determined, per the requirements of 10 CFR 55a(a)(3), that the proposed alternative provides an acceptable level of quality and safety. The District has also demonstrated that the modification, in order to achieve compliance with the specific ASME requirement, would result in hardship without a compensating increase in the level of quality and safety.

The District asks that this exemption request, once granted, become effective immediately, and remain effective until the expiration of the CNS Operating License.

Should you have any questions or require additional information regarding this request, please call.

Sincerely,

G. R. Horn
Vice President - Nuclear

GRH/MJB/dnm
Attachments

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U.S. Nuclear Regulatory Commission

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cc: H. R. Borchert
Department of Health
State of Nebraska

Regional Administrator
USNRC Region IV

NRC Resident Inspector
Cooper Nuclear Station

NPG Distribution

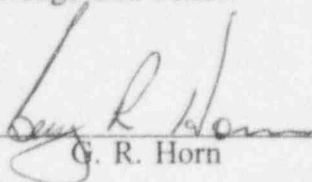
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STATE OF NEBRASKA)

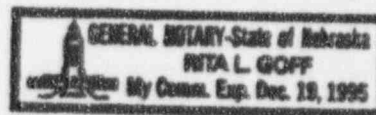
PLATTE COUNTY)

G. R. Horn, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this request on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.


G. R. Horn

Subscribed in my presence and sworn to before me this 23rd day of December, 1994.


NOTARY PUBLIC



COOPER NUCLEAR STATION
NRC DOCKET NO. 50-298
OPERATING LICENSE DPR-46
10 CFR 50.55A EXEMPTION REQUEST
24" HPCI TURBINE LINE TO 10" BRANCH WELD

Exemption Request

10 CFR 50.55a(a)(2) states, in part, that systems and components of boiling and pressurized water reactors must meet the requirements of ASME Boiler and Vessel Code specified in paragraphs (b), (c), (d), (e), (f), and (g) of this section. For Cooper Nuclear Station (CNS), the applicable code is ASME Section XI, 1980 Edition - Winter 1981 Addenda. Paragraph IWA-4120 of this code states, in part, that repairs shall be performed in accordance with the Owner's Design Specification and Construction Code of the component or system.

In accordance with the requirements of 10 CFR 50.55a(a)(3), the District requests a permanent exemption from 10 CFR 50.55a(a)(2) for the specific requirements of IWA-4120 of ASME Section XI (1980, 1981 Winter Addenda) for the 24" high pressure coolant injection (HPCI) to 10" branch weld at Cooper Nuclear Station (CNS).

The District asks that this exemption request, once granted, become effective immediately, and remain effective until the expiration of the CNS Operating License.

Discussion

The branch line in question consists of a 24 inch STD by 10 inch SCH 80 insert weldolet (WOL), a 10" Sch. 80 elbow, and a blind flange (see Fig. 1). The branch line is situated on a section of the HPCI exhaust piping located inside of the Torus portion of primary containment and is located within inches of the surface of the Torus water level where the exhaust line enters a submerged steam sparger. The weldolet was installed in 1983, per a design modification for the turbine exhaust line, by welding it to the 24" exhaust pipe with a single fillet weld. This condition was discovered during a recent Quality Assurance (QA) Department review of past QA findings. The weld nonconformance was initially discovered during a 1983 QA finding. However, response to the QA finding only addressed the structural adequacy of the as-left condition and failed to address the Code compliance concern. A Condition Report was initiated to document both the cause and the corrective action for this nonconformance.

Paragraph IWA-4120 of ASME Section XI (1980, 1981 Winter Addenda) states that repairs shall be performed in accordance with the Owner's Design Specification and Construction Code of the component or system. The Design Specification for the modification of the component in question specifies that ASME Section III Subsection NC (including 1977 Summer Addenda) be used. Paragraph NC-4240 states that, for branch connections of size greater than 2", the branch and piping connection shall be joined to the component by full penetration welds through the wall of the component.

As noted previously in this discussion, the subject weld does not meet the specific Section III requirement. However, the District has evaluated this weld and has determined that the underlying safety and function of the HPCI turbine exhaust line is not degraded, and that the

current weld configuration meets or exceeds the weld strength necessary to maintain the pressure boundary for the system. Furthermore, the industrial safety and radiological concerns associated with modifying the component exceed any benefits that might be gained by meeting the applicable Code requirements.

10 CFR 50.55a Analysis

10 CFR 50.55a(a)(3) provides the NRC a means of evaluating proposed alternatives to 10 CFR 50.55a provided the applicant demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. On the basis of the information provided herein, the District concludes that the above identified exemption request is justified pursuant to 10 CFR 50a(a)(3) in that:

- * Leaving the weld in the current configuration will provide an acceptable level of quality and safety.

The Code configuration requirements for the fabrication and installation of branch connections insures the connection will be of adequate strength such that the allowable Code stresses may be used in its evaluation. However, configurations other than those specified in the Code will result in a reliable pressure boundary for loadings less than that allowed by the Code as long as they are properly engineered. To insure that the branch weld in question results in a reliable pressure boundary, the non-Code weld configuration has been evaluated through a stress analysis. The stress analysis accounted for the actual section properties of the weld and it followed the general analysis guidelines of the ASME B&PV Code Section III, Subsection NC including appropriate stress intensification factor, branch reinforcement requirements, and loading conditions.

The conclusion of the evaluation is that the integrity of the HPCI Turbine Exhaust piping pressure boundary at the 24" pipe to 10" WOL weld is acceptable in its current condition. This conclusion is based on the following:

- 1) NDE (i.e., visual and PT) was performed on the weld at the time of installation, and the weld was found to have no surface cracks in the initial or the final weld passes.
- 2) The weld is not subjected to secondary stress loads due to thermal expansion or anchor movements that could result in future crack initiation and/or propagation.
- 3) The primary stresses in the weld are extremely low as shown in the table below.

SERVICE LEVEL	CALCULATED WELD STRESS	CODE ALLOWABLE STRESS	CALC./CODE
A	1,831 psi	15,000 psi	0.12
B	2,362 psi	18,000 psi	0.13
C	2,830 psi	27,000 psi	0.10
D	3,092 psi	36,000 psi	0.09

Note: 1) The calculated stresses are based on design/peak pressure and bending/torsional moment stresses.
2) The Code allowable stresses are based on the lowest allowable stress of either of the two components associated with the weld in question.

- 4) There is adequate reinforcement provided by the 24" XS pipe wall such that no additional branch reinforcement is required for the attached WOL.
- 5) The weld has performed satisfactorily for over eleven years of operation.

* Replacement of the subject weld with a full penetration weld, as required by ASME Section XI and its references would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Removal and replacement of the weld in question with a configuration which meets all Code fabrication and installation requirements would involve working in the Torus below the Torus catwalk on a component located approximately 6" above the normal Torus water line. The modification would therefore create a personnel safety hazard due to potential electrical shock and contamination. It also creates a risk of repair materials or other matter falling into the water and later potentially damage essential pumps, valves, and other components. In order to adequately address these safety concerns during repair/replacement, the Torus would require draining. Draining of the Torus would result in ALARA concerns due to increased radiation levels resulting from the removal of shielding provided by the water. These activities would result in an undue hardship without a commensurate increase in the level of quality and safety.

In summary, the weld does not meet all design Code requirements concerning fabrication and installation. However, due to the insignificant stresses in the weld, the fact that NDE has been performed on the weld, and the past performance history of the connection, there is adequate safety margin in the weld to substantiate that the integrity of the piping pressure boundary is acceptable, and the overall safety margin of the system design is not decreased.

The District asks that this exemption, once granted, become effective immediately, and remain effective until the expiration of the CNS Operating License.

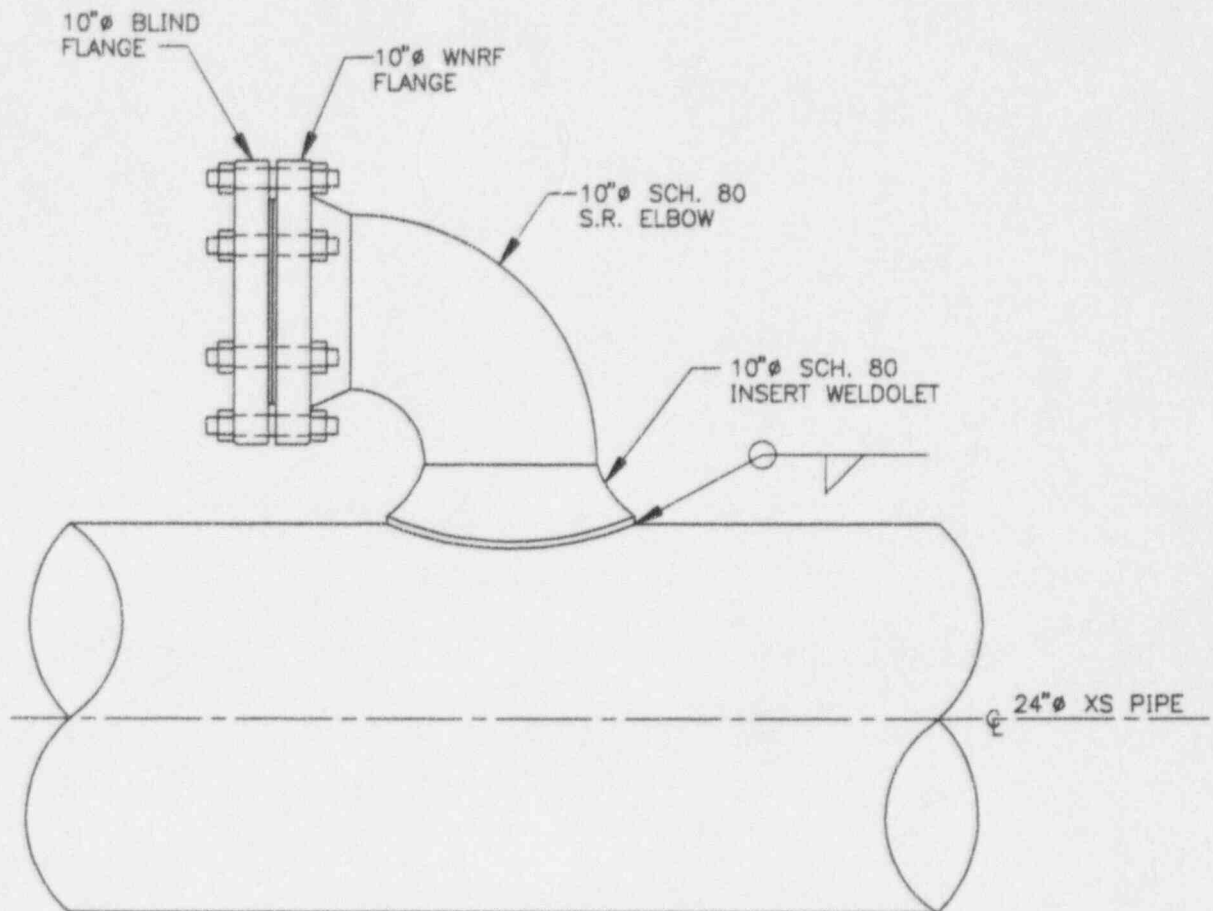


FIG. 1