UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE SECOND TEN YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF RI-07

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

The Technical Specifications for the Cooper Nuclear Station (CNS) state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).
10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Cooper Nuclear Station Second 10-Year Inservice Inspection (ISI) Interval is the 1980 Edition, through Winter 1981 Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

ENCLOSURE 1

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In a letter dated November 1, 1994, Nebraska Public Power District submitted to the NRC its Second Ten-Year Interval Inservice Inspection Program Plan Request for Relief RI-07 for the Cooper Nuclear Station.

2.0 EVALUATION AND CONCLUSIONS

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its second ten-year interval inservice inspection program plan, Request for Relief RI-07, for the Cooper Nuclear Station. The staff adopts the evaluations and conclusions contained in the contractor's attached report.

The staff concludes that the requirements of the Code are impractical for CNS and relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i), for Request for Relief RI-07. Such relief is authorized by law and will not endanger life, property, or the common defense and security, and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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TECHNICAL LETTER REPORT
ON THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF RI-07
FOR
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated November 1, 1994, the licensee, Nebraska Public Power District, submitted Request for Relief RI-07, requesting relief from the requirements of *American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI*. This request for relief is applicable for the second 10-year inservice inspection (ISI) interval, which began in December 1984. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

Based on the start date for the second 10-year interval, the Code of record for Cooper Nuclear Station is the 1980 Edition, through Winter 1981 Addenda. The information provided by the licensee in support of the request for relief has been evaluated and the basis for granting relief is documented below.

A. Relief Request RI-07, Examination Category B-H, Item B8.10, Reactor Pressure Vessel to Support Skirt Weld

Code Requirement: Table IWB-2500-1, Examination Category B-H, Item B8.10, requires volumetric or surface examination (as applicable) for Reactor Pressure Vessel lower head-to-support skirt welds. Based on the design of the Cooper Reactor Pressure Vessel support skirt, the Code requires a 100% surface examination as defined by Figure IWB-2500-13.

ENCLOSURE 2

Licensee's Code Relief Request: Relief is requested from performing the Code-required surface examination of the interior surface (C-D area, Figure IWB-2500-13) of the reactor pressure vessel-to-support skirt weld at Cooper Nuclear Station.

Licensee's Basis for Requesting Relief: (as stated)

"The Cooper Nuclear Station construction permit was issued before the effective date of the implementation for ASME Section XI and, thus, the plant was not designed to meet the requirements for inservice inspection. Therefore, 100% compliance is not feasible in all cases.

"As can be seen in Figures BA-7 and BH-1[1], the design of this weld is such that the surface examination requirements of Table IWB-2500-1 are not possible. The interior surface area is not accessible due to the configuration of vessel skirt, lower vessel head insulation, close proximity of the CRD housings, and the lack of adequate skirt access manways and maneuverability space. There is a severe angle between the vessel bottom head and the vessel skirt which physically prohibits access to the root area of the weld.

"A fracture mechanics evaluation has been performed for the support skirt to lower RPV head weld. The results of the evaluation indicate that, for a surface flaw, growth rate is extremely small, and such growth would provide negligible adverse impact upon the integrity of the weld for the remainder of plant life."

Licensee's Proposed Alternative: (as stated)

"In addition to the Code required surface examination on the A-B area, see Figure BH-1[1], a volumetric method will be used to examine the interior volume of the weld. This will consist of a ultrasonic examination utilizing a 0 degree longitudinal wave search unit, 45 degree shear wave search unit and a 60 degree shear wave search unit. Due to the configuration, the scanning will be performed in one direction only.

"The 0 degree search unit will obtain approximately 100% coverage of the weld volume, the 45 degree search unit will obtain approximately 95% coverage, and the 60 degree search unit will obtain approximately 92% coverage, scanning from one side."

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[1] Included in licensee submittal but not in this document.

Evaluation: The Code requires a 100% surface examination of both sides of the reactor pressure vessel-to-support skirt weld. However, because the Cooper Nuclear Station construction permit was issued before the effective date for implementation of ASME Code Section XI, the plant was not designed to meet the requirements for inservice inspection. Review of the licensee's submittal shows that the design of the reactor pressure vessel bottom head-to-support skirt weld does not permit surface examination of the interior portion of the support skirt weld located beneath the Reactor Pressure Vessel. This area of the weld is inaccessible due to the configuration of the vessel skirt, lower vessel head insulation, the close proximity of the CRD housings, and the lack of adequate skirt access manways and maneuverability space. There is also a severe angle between the vessel bottom head and the vessel skirt that physically prohibits access to the root area of the weld. Therefore, surface examination of the reactor pressure vessel bottom head-to-support skirt weld inside surface (area C-D as defined by Figure IWB-2500-13) is impractical to perform. To perform the surface examination to the extent required by the Code, design modifications would be necessary. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee has stated that, in addition to the Code-required surface examination on the outside surface area, a volumetric examination will be performed on the interior volume of the weld. This examination will include three examination angles, a 0 degree longitudinal wave, a 45 degree shear wave, and a 60 degree shear wave. These volumetric examinations will provide 100%, 95%, and 92% coverage, respectively.

The volumetric and surface examinations described above would detect a flaw prior to its exceeding the acceptance criteria of IWB-3516, thus providing adequate assurance of the structural integrity of the weld and ensuring that acceptable levels of quality and safety are being met.

3.0 CONCLUSION

The INEL staff has reviewed the licensee's submittal and concludes that the requirements of the Code are impractical for Cooper Nuclear Station and recommends that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i), for Request for Relief RI-07. Such relief is authorized by law and will not endanger life, property, or the common defense and security, and is otherwise in the public interest.