October 2, 2006

Mr. Randall K. Edington
Vice President-Nuclear and CNO
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION RE: FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION REQUEST FOR RELIEF NO. PR-04 (TAC NO. MD0285)

Dear Mr. Edington:

By letter dated February 23, 2006, Nebraska Public Power District (the licensee) submitted Relief Request No. PR-04, related to the Fourth 10-Year Interval Inservice Inspection (ISI) Program for the Cooper Nuclear Station. In Relief Request PR-04, the licensee requested relief from performing a system pressure test of the reactor vessel head flange leak detection line at the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code)-required test pressure corresponding to 100 percent rated reactor power.

Based on the information provided in Relief Request No. PR-04, the Nuclear Regulatory Commission (NRC) staff concluded in the enclosed safety evaluation that the ASME Code requirements are impractical and would cause significant burden on the licensee due to redesign of the reactor vessel flange if the ASME Code requirements are imposed. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the licensee's request for relief is grated as proposed in Relief Request No. PR-04 for the fourth 10-year ISI interval for the Cooper Nuclear Station.

Sincerely,

/RA/

David Terao, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUEST FOR RELIEF PR-04

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated February 23, 2006, Nebraska Public Power District (NPPD or the licensee) submitted Relief Request No. PR-04, related to the Fourth 10-Year Interval Inservice Inspection (ISI) Program for the Cooper Nuclear Station (CNS). In Relief Request PR-04, the licensee requested a relief from performing a system pressure test of the reactor vessel head flange leak detection line at the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code)-required test pressure corresponding to 100 percent rated reactor power. The licensee has stated in the request for relief that the Code requirement is impractical and would cause significant burden in redesign of the reactor vessel flange if the requirement is imposed. The Nuclear Regulatory Commission (NRC) staff has evaluated the licensee's proposed alternatives in the relief request pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(6)(i).

2.0 REGULATORY EVALUATION

10 CFR 50.55a(g) requires that ISI of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of section 50.55a(g) may be used, when authorized by the NRC, if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty 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 (ISI) 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 ISI of components and system pressure tests conducted during the first 10-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)

12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ISI Code of Record for the fourth 10-year inspection interval for CNS is the 2001 Edition through the 2003 Addenda of the ASME Code, Section XI.

3.0 BACKGROUND DISCUSSION

System/Component(s) for Which Relief is Requested

Reactor Vessel Head Flange Leak Detection Line

ASME Code Requirements

The 2001 Edition through the 2003 Addenda of ASME Code, Section XI, Table IWB-2500-1, Examination Category B-P, Item Number B15.10 requires that a system leakage test (IWB-5221(a)) be conducted at a pressure not less than the pressure corresponding to 100 percent rated reactor power. The contained fluid in the system shall serve as the pressurizing medium for the test (IWB-5210(b)).

Licensee's Request for Relief

Relief is requested from performing the system leakage test at a pressure corresponding to 100 percent rated reactor power. The licensee also proposed, as an alternative, to perform a pneumatic test in lieu of the system leakage test using reactor water as the pressurizing medium for the test.

Licensee's Basis for Requesting Relief

The Reactor Vessel Head Flange Leak Detection Line is separated from the reactor pressure boundary by one passive membrane, a silver plated O-ring located on the vessel flange. A second O-ring is located on the opposite side of the tap in the vessel flange. This line is required during plant operation in order to indicate failure of the inner flange seal O-ring. Failure of the O-ring would result in the annunciation of a High Level alarm in the control room. Upon receipt of this alarm, control room operators would quantify the leakage rate from the O-ring and then isolate the leak detection line from the drywell sump. Failure of the inner O-ring is the only condition under which this line is pressurized. The configuration of this system precludes hydrostatic testing while the vessel head is removed because the odd configuration of the vessel tap coupled with the high test pressure requirement (1000 psig minimum), prevents the tap in the flange from being temporarily plugged. Adequate testing cannot be performed when the head is installed because the seal prevents complete filling of the line, which has no available vent. Operational testing of this line is precluded, because the line will only be pressurized in the event of a failure of the inner O-ring. It is impracticable to purposely fail the inner O-ring in order to perform a pressure test.

Licensee's Proposed Alternative

> The licensee proposed the following alternatives as two options. Option 2 is a proposed alternative only if scheduling or plant operations prevent Option 1 from being performed.

Option 1: A VT-2 visual examination will be performed on the line when the reactor cavity is flooded. The minimum hydrotest pressure while the reactor cavity is flooded is based on the flood depth of the cavity when the vessel head is removed. This flood depth is approximately 20 feet of water (8-10 psi). This option would require a four-hour hold time prior to conducting the VT-2 inspection, and does not require insulation to be removed. Therefore, the time needed to be in the drywell is reduced which would reduce radiation dose to personnel.

Option 2: As an alternative to Option 1, a pneumatic test at 100 psig will be performed. During the performance of this test, insulation will be removed. The line will be pressurized to 100 psig and soap bubble tested. A VT-2 visual will also be performed. The pneumatic test meets or exceeds the ability of the approved test methodology to detect leakage. The piping insulation removal and reinstallation, and soap bubble test of the line adds significant time to the inspection.

Either of the testing alternatives will be performed in accordance with the frequency specified in Table IWB-2500-1 of Section XI of the ASME Code.

4.0 TECHNICAL EVALUATION

The ASME Code, Section XI of Record requires that all Class 1 components within the reactor coolant system boundary undergo a system leakage test at the end of each refueling outage and a system hydrostatic test at or near the end of each inspection interval. In Relief Request No. PR-04, the licensee requested a relief from performing a system pressure test of the reactor vessel head flange leak detection line at the Code-required test pressure corresponding to 100 percent rated reactor power. The line is located between the inner and the outer O-ring seals of the vessel flange and is required during plant operation in order to detect failure of the inner flange seal O-ring. The design of this line makes the Code-required system pressure test impractical because of the possibility of damage to the O-ring seals. To perform the system pressure test in accordance with the Code requirements, the head flange leak detection line would have to be redesigned, fabricated, and installed. This would impose severe burden on the licensee. The licensee has proposed under Option 1 to perform a VT-2 visual examination of the leak detection line when the reactor cavity is flooded with water up to 20 feet above the flange. Under Option 2, the licensee proposed to perform a soap bubble test at 100 psig air pressure. The pneumatic test with application of soap solution is considered to be more sensitive to detect smaller flaws than that of the test proposed under Option 1. However, the licensee has proposed Option 2 as an alternative only if scheduling or plant operations prevent Option 1 from being performed. The NRC staff believes that the test proposed under either alternative will detect gross inservice flaws, and the proposed testing would provide reasonable assurance of operational readiness and therefore, is acceptable.

5.0 CONCLUSION

Based on the NRC staff's evaluation of the request for relief, the Code requirement to perform a system pressure test of the reactor vessel head flange leak detection line at the Code-required test pressure corresponding to 100 percent rated reactor power is impractical and would cause undue burden to the licensee if the requirement is imposed. The licensee's proposed alternatives provide reasonable assurance of operational readiness. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the licensee's request for relief as proposed in Relief Request No. PR-04 is granted for the fourth 10-year ISI interval of CNS. The relief granted is authorized by law and will not endanger life or 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. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: P. Patniak

Date: October 2, 2006

Cooper Nuclear Station

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