

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-06
(TAC NO. MD0286)

Dear Mr. Edington:

By letter dated February 23, 2006, Nebraska Public Power District (the licensee) submitted Relief Request No. PR-06, related to the Fourth 10-Year Interval Inservice Inspection (ISI) Program for the Cooper Nuclear Station. In Relief Request PR-06, the licensee requested relief from performing the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code)-required pressure test of the buried portion of service water piping by measuring rate of pressure loss or change in flow between the ends of the buried components. Alternatively, the licensee proposed a test that will confirm that flow during operation is not impaired.

Based on the information provided in Relief Request No. PR-06, the staff concluded in the enclosed safety evaluation that the licensee's proposed alternative provides reasonable assurance of operational readiness, and compliance with the ASME Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the staff authorizes the ISI program alternative proposed in Relief Request No. PR-06 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-06

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated February 23, 2006, Nebraska Public Power District (the licensee) submitted Relief Request No. PR-06, related to the Fourth 10-Year Interval Inservice Inspection (ISI) Program for the Cooper Nuclear Station (CNS). In Relief Request PR-06, the licensee requested relief from performing the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code)-required pressure test of the buried portion of service water piping by measuring rate of pressure loss or change in flow between the ends of the buried components. The licensee has stated that the isolation valves that are used for measuring rate of pressure loss are not suitable for performing pressure isolation function and there is no flow instrumentation upstream of the buried piping. Alternatively, the licensee proposed a test that will confirm that flow during operation is not impaired. The integrity of the buried piping will be verified during quarterly pump testing under inservice testing program for pumps and valves. The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's proposed alternative pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii) since compliance to the Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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

Buried Class 3 Components Subject to System Pressure Testing in Service Water System

ASME Code Requirements

The 2001 Edition through the 2003 Addenda of ASME Code, Section XI, Table IWD-2500-1, Examination Category D-B, Item Number D2.10 requires a system leakage test and visual examination of service water piping. For buried components where a VT-2 visual examination cannot be performed, the examination requirement is satisfied by the following:

The system pressure test for buried components that are isolable by means of valves shall consist of a test that determines the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components. The acceptable rate of pressure loss or flow shall be established by the licensee.

Licensee's Request for Relief

Relief is requested from performing the system leakage test for buried portions of service water piping that are isolable by means of valves by measuring rate of pressure loss or the change in flow between the ends of buried components.

Licensee's Basis for Requesting Relief

Pursuant to 10 CFR 50.55a, "Codes and standards," Section (a)(3), relief is requested from the requirements of ASME Code, Section XI, IWA-5244(b)(1), because the isolation valves are not suitable for performing a pressure isolation function. For the buried portion of the Service Water critical supply headers, isolation valves are installed in the system. The isolation valves located in the Service Water Building and the Control Building that isolate the buried piping are large butterfly valves which are not suitable for performing a pressure isolation function. Each critical header supplies two Residual Heat Removal Service Water booster pumps, one Reactor Equipment Cooling heat exchanger, and one diesel generator. A butterfly valve isolation valve is installed in main header in the Service Water Building and in each of these branch supply lines in the Control Building.

However, since these valves are not designed to be leak tight, these five butterfly valves would provide multiple leakage paths. Leakage testing of this buried piping and determining the rate of pressure loss would require extensive valve seat maintenance and would not provide conclusive test results.

IWA-5244(b)(1) also allows determining a change in flow between the ends of the buried components. Flow instrumentation is installed in the Service Water lines in the Control Building. However, no flow instrumentation is installed in the system upstream of the buried piping. Accurate flow measurements using temporary flow instruments (e.g., ultrasonic flow meters) are not possible due to insufficient runs of straight pipe between the pump discharge and the buried piping.

The installation of permanent flow instruments would require significant system modification. The cost of these modifications, when weighed against the benefits, is not justifiable.

Licensee's Proposed Alternative

In lieu of performing a system pressure test in accordance with the requirements specified in IWA-5244(b)(1), CNS shall use the provisions of IWA-5244(b)(2) to confirm that flow during operation is not impaired. The integrity of the buried piping will be verified during quarterly service water pump testing. Trending of pressure drop across each pump will indicate leakage through the buried piping assuming no degradation of the pump. Should the pump test results fall in the required action range of the Code, additional testing and evaluations will be performed to determine whether the unsatisfactory test results are due to side-stream leakage past butterfly valves, degraded pump performance, or through-wall leakage.

4.0 TECHNICAL EVALUATION

The Code of Record requires a system pressure test for the buried portion of Service Water piping that will determine either a rate of pressure loss or a change in flow at the ends of the buried piping. The buried Service Water piping at CNS uses butterfly valves at the ends which were not designed for pressure isolation and therefore, are unsuitable to determine meaningful rate of pressure loss. One end of buried piping is not instrumented for flow measurement which does not permit measurement of change in flow. Therefore, the Code-required test cannot be performed. The Code, however, allows for nonisolable buried components to confirm that flow during operation is not impaired. The NRC staff agrees with the licensee's approach that unimpaired flow in the buried piping can be qualitatively assessed during quarterly Service Water pump test. Using the downstream flow instrument, a reference flow would correspond to a target pump head. As the pump degrades, the developed head decreases at the reference flow. However, a decrease in pump head may also indicate increase in flow due to any through-wall leakage in the buried piping or side-stream leakage into the isolated non-critical headers. From trending of head loss (pressure drop) during a pump test at the reference flow, an assessment can be made on the integrity of buried piping. The licensee has stated that should the pump test results fall in the required action range of the Code, additional testing and evaluations will be performed to determine whether the unsatisfactory test results are due to side-stream leakage past butterfly isolation valves, degraded pump performance, or through-wall leakage in the buried portion of piping.

The NRC staff has determined that the licensee's proposed alternative to test the buried portion of Service Water piping in conjunction with quarterly testing of Service Water pumps would detect significant through-wall leakage if present in the subject line and would provide reasonable assurance of operational readiness. Compliance with the Code requirement would require installation of an additional flow measuring device at the inlet end of the buried piping

which would result in hardship without a compensating increase in the level of quality and safety.

5.0 CONCLUSION

The NRC staff concludes that for the buried portion of Service Water piping, compliance with the Code requirement to perform a test that determines the rate of pressure loss or the change in flow would result in hardship to the licensee without a compensating increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance of operational readiness. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative in Relief Request No. PR-06 is authorized for the fourth 10-year ISI interval of CNS. 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.

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Date: October 2, 2006

Cooper Nuclear Station

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