

October 26, 2001

Mr. David L. Wilson
Vice President of Nuclear Energy
Nebraska Public Power District
P. O. Box 98
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SUBJECT: COOPER NUCLEAR STATION - RELIEF REQUEST FOR THE EXERCISE
FREQUENCY FOR EXCESS FLOW CHECK VALVES IN THE PUMP AND
VALVE TESTING PROGRAM (TAC NO. MB1820)

Dear Mr. Wilson:

In its letter of April 12, 2001, the Nebraska Public Power District (the licensee) submitted Relief Request RV-10, Revision 1, for the inservice testing program for pumps and valves for Cooper Nuclear Station. The NRC staff has reviewed the proposed alternative testing interval contained in the relief request against the requirements of the 1989 edition of the American Society of Mechanical Engineers' Boiler and Pressure Vessel Code (the Code) pursuant to Section 50.55a of Part 50 to Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a). The associated technical specification amendment request is being reviewed separately.

The proposed alternative to the Code requirements described in RV-10, Revision 1, is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety for the duration of the term of the current operating license.

A copy of the staff's safety evaluation is enclosed.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure: Safety Evaluation

cc w/encls: See next page

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Cooper Nuclear Station

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July 2001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR RELIEF FROM ASME CODE, SECTION XI, REQUIREMENTS
FOR EXCESS FLOW CHECK VALVES FOR THE
INSERVICE TESTING PROGRAM
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

1.0 INTRODUCTION

Section 50.55a of Part 50 to Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a) requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements that are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

By letter dated April 12, 2001, Nebraska Public Power District, the licensee for Cooper Nuclear Station (CNS), submitted Relief Request RV-10, Revision 1, related to the inservice testing (IST) program requirements for the excess flow check valves (EFCVs). The NRC's findings with respect to authorizing the alternative proposed in the relief request are given below.

2.0 EVALUATION

The licensee requests relief from the exercise frequency requirements of the Code (OMa-10, paragraph 4.3.2.1) for the EFCVs. The licensee proposes that proper operation of the valves be demonstrated during functional testing of a representative sample of valves performed every 18 months such that each EFCV will be tested at least once each ten year interval.

2.1 Background

EFCVs have an active safety function in the closed position to provide containment isolation and are reactor coolant system pressure boundary isolation valves. They prevent excess flow of reactor water should an instrument line break occur outside containment. EFCVs are installed in instrument lines which connect to the reactor vessel. Each line contains a 1/4 inch restriction orifice inside the containment in order to limit flow leakage in the event the instrument line breaks.

These instrument lines are in compliance with the requirements of Safety Guide 11, Supplement 1, except there is no remote indication of the EFCV. This design ensures that in the event of a postulated piping or component failure (1) leakage is reduced to the maximum extent practical, (2) the rate and extent of coolant loss is within the capability of the reactor coolant make up system, (3) the integrity and performance of the secondary containment and associated safety systems will be maintained, and (4) the potential offsite exposure will be substantially less than 10 CFR [Part] 100 guidelines.

2.2 Licensee's Basis for Requesting Relief

The licensee states:

Uninterrupted function of these valves is essential for the safe operation of the plant. Quarterly testing in accordance with Section XI would interrupt instruments required for safety-system actuation, reactor shutdown, or sensing accident conditions. In addition, these valves cannot be exercised during cold shutdown because removal of multiple instruments from service could prevent or interrupt the operation of systems required for decay heat removal. Testing this frequently could jeopardize the safety of the reactor. [As clarified during a September 13, 2001 conference call, the licensee stated these valves cannot be exercised during cold shutdown, leaving refueling as the only possible testing frequency (which is the current test frequency)]. EFCVs are reliable devices. The major components consist of a poppet and spring. The spring holds the poppet open only under static conditions. The valve will close upon sufficient differential pressure across the poppet.

EFCVs have been proven to be highly reliable at CNS and throughout the industry. CNS testing results of EFCVs from the ten-year period of 1991 through 2000 were evaluated and revealed zero closure failures out of 476 tests. General Electric (GE) Nuclear Energy Topical Report B21-00658-01, "Excess Flow Check Valve Testing Relaxation," dated November 1998 (SER [safety evaluation report] to BWR Owners Group from NRC, dated March 14, 2000, subject: "Safety Evaluation of General Electric Nuclear Energy Topical Report B21-00658-01, 'Excess Flow Check Valve Testing Relaxation' [TAC NOS. MA7884 And M84809])," also provides evidence of EFCV reliability. The Topical Report evaluated EFCV testing history from 12 BWR [boiling water reactor] plants and reported a low failure rate (i.e., 11 failures in 12,424.5 valve-years of service or one failure in 1129 valve-years of service).

The proposed alternate test involves testing in accordance with CNS Technical Specification (TS) Surveillance Requirement (SR) 3.6.1.3.8. A representative sample of EFCVs will be functionally tested every 18 months. The SR 3.6.1.3.8 test frequency is adequate to maintain a high degree of reliability and availability, and provides an acceptable level of quality and safety. Justification for the adequacy of this test frequency is contained in license amendment request letter NLS2001022, Attachment 2 [dated April 12, 2001], and is based on information contained in the above referenced SER.

2.3 Alternative Testing

The licensee proposes:

In lieu of Section XI quarterly functional testing, a representative sample of EFCVs will be functionally tested every 18 months such that each EFCV will be tested at least once each ten year interval.

2.4 Evaluation

OMa-10, paragraph 4.3.2.1, requires that check valves be exercised every 3 months to verify that they fulfill their safety function. The licensee proposes to demonstrate the proper operation of each valve during the TS-required operability testing.

In its April 12, 2001 letter, the licensee requested a change to the frequency of the TS-required operability testing from testing all EFCVs every 18 months to testing a representative sample of the EFCVs every 18 months such that all EFCVs are tested at least once every 10 years. In order to fully implement this TS change, the licensee also requested relief from the associated Code requirement for exercising these valves.

In evaluating the TS change (SER dated October 26, 2001, for Amendment No. 189), the NRC staff concluded that the impact of the increase in EFCV surveillance test intervals to 10 years would result in an increase in the release frequency of about $5.62E-05$ /year from the current release frequency estimate (for an 18-month surveillance test interval) of about $9.91E-06$ /year. The NRC staff considered this estimate to be sufficiently low, especially since the consequence of such an accident is unlikely to lead to core damage. The NRC staff also concluded that the consequences of the steam release from the depicted events is bounded by an existing analysis. Based on the acceptability of the methods applied to estimate the release frequency, a relatively low release frequency estimate in conjunction with the unlikely impact on core damage, and negligible consequence of a release in the reactor building, the NRC staff concluded that the increase in risk associated with the licensee's request for relaxation of EFCV surveillance testing is low.

The intent of both the TS surveillance requirement and the Code requirement for exercising the EFCVs is to ensure that there is reasonable assurance that the EFCVs will perform their design function if they are called upon. In its evaluation of the TS change, the NRC staff has concluded that testing at the revised frequency will continue to provide this assurance. Therefore, the licensee's proposed alternative in the relief request will continue to provide an acceptable level of quality and safety and the relief may be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.0 CONCLUSION

The licensee's proposed alternative to the exercise frequency requirements of OMa-10, paragraph 4.3.2.1, for the EFCVs is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the alternative providing an acceptable level of quality and safety for the duration of the term of the current operating license.

Principal Contributor: D. Wrona

Date: October 26, 2001