

March 31, 2003

Mr. Clay C. Warren  
Vice President of Nuclear Energy  
Nebraska Public Power District  
P.O. Box 98  
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - RE: REQUEST FOR RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE CONCERNING INSERVICE TESTING OF ALL PUMPS AS REQUIRED BY ASME/ANSI OMA-1988, PART 6, PARAGRAPH 6.1 (TAC NO. MB6822)

Dear Mr. Warren:

By letter dated November 14, 2002, Nebraska Public Power District (the licensee) requested relief (Relief Request RP-07) from certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) and American National Standards Institute (ANSI) requirements for Inservice Testing as required by ASME/ANSI OMa-1988, Part 6, Paragraph 6.1.

The U. S. Nuclear Regulatory Commission (NRC) staff has evaluated your request and determined that Relief Request RP-07 is acceptable with the understanding that the use of analysis method should be used cautiously, the analysis methodology shall be in accordance with ASME OM Code-1998 Edition and 2000 Addenda, Paragraph ISTB-6200(c), and in accordance with the guidance provided by Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," dated November 7, 1991, with the October 8, 1997 revision. Accordingly, NRC staff concludes that compliance with the specified Code requirements for RP-07 would result in hardship or unusual hardship without a compensating increase in the level of quality and safety, and therefore, the proposed alternatives are authorized pursuant to Section 50.55a(a)(3)(ii) of Title 10 of the *Code of Federal Regulations* (10 CFR) for the third 10-year Inservice Inspection interval at Cooper Nuclear Station.

Mr. C. Warren

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The NRC staff's safety evaluation is enclosed. This completes the technical review for TAC No. MB6822. If you have any questions, please contact Mohan Thadani at 301-415-1476.

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/encl: See next page

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PDIV-1 Reading

RidsNrrDlpmLpdiv (HBerkow)

RidsNrrDlpmLpdiv1 (RGramm)

RidsNrrPMMThadani

RidsNrrLAMMcAllister

GHill (2)

RidsOgcRp

RidsAcrsAcnwMailCenter

SMorris, RIV Plants (SAM1)

RidsRgn4MailCenter (AHowell)

YHuang (NRR/DSSA/SRXB)

DTerao (NRR/DE/EMEB)

**ADAMS Accession No. ML030900384**

**NRR-028**

OFFICE	PDIV-1/PM	PDIV-1/LA	EMEB*	OGC	PDIV-1/SC
NAME	DJaffe for MThadani	MMcAllister	DTerao	SUttal - NLO With Changes Noted	RGramm
DATE	3/17/03	3/17/03	2/28/03	3/27/03	3/31/03

\* SE input via memo to Robert A. Gramm dated 2/28/2003

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PUMP INSERVICE TEST RELIEF

REQUEST RP-07

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NUMBER 50-298

1.0 INTRODUCTION

By letter dated November 14, 2002, Nebraska Public Power District (NPPD, the licensee), for Cooper Nuclear Station (CNS), requested relief (Relief Request RP-07), from certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) and American National Standards Institute (ANSI) requirements for Inservice Testing (IST) of pumps as required by ASME/ANSI OMa-1988, Part 6, Paragraph 6.1.

In lieu of the applicable Code requirements for the CNS IST Program, NPPD proposed implementation of the 1998 Edition and 2000 Addenda, of the ASME OM-Code. The 1998 edition and 2000 addenda have been incorporated by reference in Section 50.55a(b) of Title 10 of the *Code of Federal Regulations* (10 CFR), on September 26, 2002 (64 CFR 60520). The current Code of record for the CNS IST program is the ASME OMa-1988 Code, Part 6 (pumps).

2.0 BACKGROUND

The regulations in 10 CFR 50.55a require that IST of certain ASME Code Class 1, 2, and 3 pumps and valves, be performed in accordance with Section XI of the ASME OM-Code and applicable addenda, except when alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to 10 CFR 50.55a(a)(3)(i), 10 CFR 50.55a(a)(3)(ii), or 10 CFR 50.55a(f)(6)(i). In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the alternatives will 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 would be impractical for its facility. The regulations in 10 CFR 50.55a authorize the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. The regulation of 10 CFR 50.55a(f)(4)(iv) states that IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to Commission approval. Portions of editions or addenda may be used provided that all the related requirements of the respective editions and addenda are met.

### 3.0 EVALUATION OF RELIEF REQUEST

#### RELIEF FROM ASME CODE REQUIREMENTS FOR INSERVICE TESTING OF ALL PUMPS AS REQUIRED BY ASME/ANSI OMa-1988, PART 6, PARAGRAPH 6.1

##### 3.1 The Items for which Relief is Requested:

PUMP: All IST Pumps  
CLASS: Various  
FUNCTION: Various

##### 3.2 Code Requirements (as stated):

ASME/ANSI, OMa-1988, Part 6, Paragraph 6.1, states that if deviations fall within the alert range of Table 3, the frequency of testing specified in paragraph 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected and if the deviations fall within the required action range of Table 3, the pump in question shall be declared inoperable until the cause of the deviation has been determined and the condition corrected.

##### 3.3 Licensee's Proposed Alternative (as stated):

In addition to meeting the requirements of OMa-1988, Part 6, Paragraph 6.1, if pump test data falls within the existing alert or required action limits of Table 3 of OMa-1988, Part 6, an analysis may be performed in accordance with ISTB-6200(c) of the 1998 Edition of the OM-Code. In cases where the pump's test parameters are within either the alert or required action ranges of Table 3 of OMa-1988, Part 6, as applicable, and the pump's continued use at the changed values is supported by an analysis, a new set of reference values may be established. This analysis shall include verification of the pump's operational readiness. The analysis shall include both a pump level and a system level evaluation of operational readiness, the cause of the change in pump performance, and an evaluation of all trends indicated by available data. The results of this analysis shall be documented in the record of tests.

Only the requirements associated with performing an acceptable analysis per paragraph ISTB-6200(c), will be incorporated. No other requirements of the 1998 OM-Code regarding pump testing are included with this request for relief.

##### 3.4 Licensee's Basis for Relief (as stated):

The Nebraska Public Power District (NPPD) submits this relief request for Nuclear Regulatory Commission (NRC) review and approval in accordance with 10 CFR 50.55a(a)(3)(ii). Compliance with the specified requirement results in hardship or unusual difficulty without a compensating increase in the level or quality and safety.

OMa-1988, Part 6, Paragraph 6.1, does not specifically state it is permissible to analyze pumps that have entered the alert or required action ranges. The 1998 Edition, 2000 Addenda of the OM-Code, paragraph ISTB-6200(c), provides the option to analyze pumps in the alert or required action ranges. This edition and addenda of the code have been incorporated by reference in 10 CFR 50.55a with an amendment to that regulation

effective October 28, 2002. Per 10 CFR 50.55a(f)(4)(iv), inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section, subject to the limitations and modifications listed in paragraph (b) of this section, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

There may be times when it is appropriate to analyze a pump that enters the alert range, but remains below the required action limit. For example, if a very smooth running pump is re-baselined following pump replacement, the actual "break-in" vibration or D/P data may not be apparent until the pump has been operating for some time period. Therefore, later testing of the pump may result in approaching or exceeding the alert limit without actually representing a degraded pump condition. Per the applicable code of record, this would result in the need to place the pump on increased frequency testing until the cause of the deviation has been determined and the condition has been corrected. For cases such as these, an analysis could be utilized to re-baseline the pump to create new, more appropriate, alert and required action limits, without exceeding the absolute limits identified in Table 3 of OMa-1988, Part 6. Therefore, by incorporating ISTB-6200(c), there would be clear guidance to allow evaluation of pumps that have entered the alert range. The current code of record does not clearly state that this is an acceptable course of action.

Relief is requested per 10 CFR 50.55a(a)(3)(ii), in that compliance with the current Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. It is an unnecessary hardship to continue to test a pump on increased frequency or to perform unnecessary maintenance on a pump to satisfy the requirements of OMa-1988, Part 6, should it be clear that the pump is operating acceptably. Unnecessary testing or maintenance reduces system availability and increases entries into Technical Specification Limiting Conditions for Operation. Further, the performance of additional testing or maintenance in cases where a documented analysis could demonstrate pump acceptability does not result in a compensating increase in the level of quality and safety.

### 3.5 Evaluation:

The OMa-1988, Part 6, paragraph 6.1, "Acceptance Criteria," specifies actions required to be taken if any of the measured pump parameters fall within the alert or required action ranges. For test results in the alert range, the frequency test shall be doubled (every 1.5 months) until the cause of the deviation is determined and the condition is corrected. For test results in the required action range, the pump shall be declared inoperable until the cause of the deviation has been determined and the condition corrected.

ASME OM-Code 1998 Edition and 2000 Addenda, were incorporated by reference in 10 CFR 50.55a(b) on September 26, 2002 (64 CFR 60520). ASME OM Code-1998, ISTB-6200(c), "New Reference Values," states that:

In cases where the pump's test parameters are either within the alert or required action ranges of Table ISTB-5100-1, Table ISTB-5200-1, Table 5300-1, or Table 5300-2, as applicable, and the pump's continued use at the changed values is supported by

analysis, a new set of reference values may be established. This analysis shall include both a pump level and a system level evaluation of pump operational readiness, the cause of the change in pump performance, and an evaluation of all trends indicated by available data.

Paragraph ISTB-6200(a) in ASME OM Code-1998 Edition, for the pump alert range, provides the same acceptance criteria as OMa-1988, Part 6, which continues to specify doubling the test frequency if the test parameter falls within the alert range. Paragraph ISTB-6200(b) provides acceptance criteria for the required action range, that the pump in question be declared inoperable until the cause of deviation is determined and the condition corrected. However, paragraph ISTB-6200(b) also allows an analysis to be performed and new reference values to be established in accordance with ISTB-6200(c) in lieu of pump repair or replacement specified in OMa-1988. The licensee has proposed to adopt ISTB-6200(a), (b) and (c) in order to establish new reference values by analysis of pump performance. The regulations, as specified in 10 CFR 50.55a(f)(4)(iv), allow the adoption of portions of later editions and addenda of the Code provided related requirements are met.

The NRC staff has previously issued guidance on performing an analysis where the result of an ASME Code test of a pump or valve concludes that the operability of the component is questionable. NRC Generic Letter (GL) 91-18, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," dated November 7, 1991, with the October 8, 1997, revision, discussed resolution of degraded and nonconforming conditions and operability. In Section 6.11 of GL 91-18, "Technical Specification Operability vs. ASME Code, Section XI Operative Criteria," the NRC staff indicates that, in cases where the required action range limit is more conservative than its corresponding technical specification limit, the corrective action may not be limited to replacement or repair. The corrective action may consist of an analysis to demonstrate that the specific pump performance degradation does not impair operability and that the pump or valve will fulfill its function. A new required action range may be established after such an analysis which would then allow a determination of operability. Hence, when licensees request to use the analysis alternative in ASME OM Code-1998, ISTB-6200, the NRC staff has authorized the alternative because it is consistent with the guidance in GL 91-18.

The performance of analysis to establish pump reference values should include, at a minimum, a comparison of the current measurements for the particular parameter (i.e., flow rate, vibration, discharge pressure, or differential pressure) to the baseline measurements, an evaluation of the trend of available data for the parameter, and a determination of the cause and the need for corrective action. Alternative diagnostic methods, such as vibration spectral analysis, are expected to be used to support the analysis. The analysis is subject to NRC inspection. This analysis must provide reasonable assurance that the condition of the pump will not further degrade such that, before the next pump test or before repairs can be performed, the pump will fail. Additionally, it should be noted that the changes to the vibration reference values would only affect the vibration relative alert and required action limits, and not the absolute limits specified by the Code. If the absolute limits are exceeded, the licensee would be required to declare the pump inoperable in accordance with the Code.

The NRC staff notes that the use of this analysis to continue the operation of the pumps should be used cautiously. This analysis is not intended to be used regularly to evaluate the operability of all pumps that fall into the required action range in order to declare the pump operable and

define new reference values where significant degradation has occurred. Repeated application of this analysis could lead to stair-stepping the Code limits downward to the safety limits of the pump, and lead to component failure. The licensee should have an understanding of the margin of each pump above its design basis requirements.

With this understanding, the NRC staff considers the acceptance of the licensee's proposal to be appropriately evaluated based on the provisions in 10 CFR 50.55a(f)(4)(iv), regarding the use of more recent editions of the ASME Code. The NRC staff finds that the licensee's proposed alternative to perform an analysis to establish new reference values provides reasonable assurance of operational readiness of the pump.

#### 4.0 CONCLUSIONS

The NRC staff concludes that, with respect to the compliance with the Code's requirements for IST of pumps, the proposed alternative to use ASME OM Code-1998 Edition and 2000 Addenda, Paragraph ISTB-6200(c), in lieu of paragraph 6.1 of OMa-1988, Part 6 (Code of record), for pump acceptance criteria, is acceptable for the third 10-year IST interval pursuant to 10 CFR 50.55a(f)(4)(iv). Therefore, the proposed relief is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for IST of pumps at CNS.

Principal Contributor: Y. S. Huang

Date: March 31, 2003



Cooper Nuclear Station

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