



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

April 26, 2010

Mr. Brian J. O'Grady
Vice President-Nuclear and CNO
Nebraska Public Power District
72676 648A Avenue
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR RELIEF NO. RV-06 FOR THE FOURTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM REGARDING CONTROL ROD DRIVE SYSTEM VALVES (TAC NO. ME1521)

Dear Mr. O'Grady:

By letter dated June 18, 2009, as supplemented by letters dated September 30 and November 18, 2009, to the U.S. Nuclear Regulatory Commission (NRC), Nebraska Public Power District (NPPD, the licensee) submitted request for relief number RV-06 from certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) at Cooper Nuclear Station (CNS).

Specifically, the licensee requested in RV-06 to perform testing of specific check valves, solenoid-operated valves, and air-operated valves within the control rod drive system in accordance with the existing CNS Technical Specification surveillance requirements as an alternative to the testing required by the OM Code.

The applicable OM Code at CNS for the fourth 10-year IST interval, which commenced on March 1, 2006, is the 2001 Edition through the 2003 Addenda.

The request for relief was proposed pursuant to the provisions of paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR). Based on a review of the information you provided in your request for relief, the NRC staff determined that the proposed alternative provides an acceptable level of quality and safety. Therefore, the alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year IST interval.

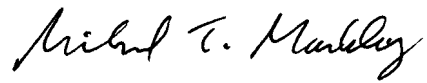
All other ASME OM Code requirements for which relief was not specifically requested and approved remain applicable.

B. O'Grady

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The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please contact Mr. F. Lyon of my staff at (301) 415-2296 or via e-mail at fred.lyon@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Michael T. Markley". The signature is written in a cursive style with a large, prominent "M" and "T".

Michael T. Markley, 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: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INSERVICE TESTING INTERVAL

REQUEST FOR RELIEF NO. RV-06

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

1.0 INTRODUCTION

By letter dated June 18, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091760099), as supplemented by letters dated September 30 and November 18, 2009 (ADAMS Accession Nos. ML092800387 and ML093270062, respectively), Nebraska Public Power District (NPPD, the licensee) submitted request for relief number RV-06, applicable for the remainder of its fourth 10-year inservice testing (IST) program interval at the Cooper Nuclear Station (CNS). The licensee requested an alternative test plan in lieu of certain IST requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code). The applicable ASME OM Code for CNS for the fourth 10-year IST interval is the 2001 Edition through 2003 Addenda. The NPPD fourth 10-year IST interval began on March 1, 2006. The U.S. Nuclear Regulatory Commission (NRC) staff evaluation of the request for an alternative test plan is contained herein.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(a)(3)(i), the licensee proposed to use the existing CNS Technical Specification surveillance requirements as an alternative on the basis that the alternative provided and acceptable level on quality and safety.

2.0 REGULATORY EVALUATION

The IST of ASME Class 1, 2, and 3 components is to be performed in accordance with the requirements of the applicable ASME OM Code and applicable addenda, as required by 10 CFR 50.55a(f), "Inservice testing requirements," except where alternatives have been authorized pursuant to paragraphs (a)(3)(i) and (a)(3)(ii) of 10 CFR 50.55a.

In proposing alternatives, the licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety, or that compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The regulations in

Enclosure

10 CFR 50.55a allow the NRC to authorize alternatives to ASME OM Code requirements upon making the necessary findings. NRC guidance contained in NUREG-1482, Revision 1, "Guidance for Inservice Testing at Nuclear Power Plants," provides alternatives to ASME OM Code requirements which are acceptable, and in NRC Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs."

3.0 TECHNICAL EVALUATION

3.1 Licensee's Request

The licensee requested alternative testing for the following components:

Control Rod Drive (CRD) System Hydraulic Control Unit (HCU)

CRD-SOV-S0120* - CRD withdrawal/exhaust solenoid valve
CRD-SOV-S0121* - CRD withdrawal/exhaust solenoid valve
CRD-SOV-S0122* - CRD withdrawal/exhaust solenoid valve
CRD-SOV-S0123* - CRD withdrawal/exhaust solenoid valve
CRD-AOV-CV126* - CRD scram inlet valve
CRD-AOV-CV127* - CRD scram outlet valve
CRD-CV-114CV* - CRD scram outlet check valve
CRD-CV-138CV* - CRD cooling water header check valve

* Typical of 137 HCUs

The following are the ASME OM Code requirements:

- ISTC-3510 states that active Category A, Category B and Category C check valves shall be exercised nominally every 3 months except as provided by ISTC-3520, ISTC-3540, ISTC-3550, ISTC-3560, ISTC-5221, and ISTC-5222.
- ISTC-3560 states that valves with fail safe actuators shall be tested by observing the operation of the actuator upon loss of valve actuating power in accordance with the exercising frequency of ISTC-3510.
- ISTC-5131(a) states that active valves shall have their stroke times measured when exercised in accordance with ISTC-3500 (pneumatically-operated valves).
- ISTC-5151(a) states that active valves shall have their stroke times measured when exercised in accordance with ISTC-3500 (solenoid-operated valves).
- ISTC-5221(a)(1) states that check valves that have a safety function in both the open and close directions shall be exercised by initiating flow and observing that the obturator has traveled to either the full open position or to the position required to perform its intended function(s) (see ISTA-1100), and verify that on cessation or reversal of flow, the obturator has traveled to the seat.

- ISTC-5221(a)(2) states that check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled either the full open position or to the position required to perform its intended function(s) (see ISTA-1100), and verify closure.

For CRD-CV-138CV, the licensee stated in its submittals that,

The CRD cooling water header check valve (typical of 137 HCUs) has a safety function to close in the event of a scram to prevent diversion of pressurized HCU accumulator water to the cooling water header.

The applicable code requirements for this check valve is that it be exercised open and closed per ASME OMB Code-2003 Sub-section ISTC-5221(a) at a frequency determined by ISTC-3510. The check valve is adequately opened (non-safety function) with cooling water and closed (safety function) with successful control rod motion. The alternative being requested is to test this check valve via control rod exercising in accordance with Technical Specification SR [Surveillance Requirement] 3.1.3.2 and SR 3.1.3.3.

For CRD-SOV-SO120, CRD-SOV-SO121, CRD-SOV-SO122, and CRD-SOV-SO123, the licensee stated in its submittals that,

The withdrawal and exhaust solenoid valves (typical of 137 [HCUs]) have a safety function to close in order to provide a boundary to non-code class piping.

The applicable code requirements for these solenoid valves are that they be exercised closed at the appropriate frequency per ISTC-3510, fail safe tested closed per ISTC-3560, and stroke time tested closed per ISTC-5151. The solenoid valves are adequately exercised and fail safe tested closed with successful normal control rod motion. The alternative being requested is to test these solenoid valves via control rod exercising in accordance with Technical Specification SR 3.1.3.2 and SR 3.1.3.3. The stroke time testing per ISTC-5151 will not be performed.

For CRD-AOV-CV126, CRD-AOV-CV127, and CRD-CV-114CV, the licensee stated in its submittals that,

These scram valves operate as an integral part of their respective HCU to rapidly insert the control rods in support of a scram. The CRD scram inlet valve, CRD-AOV-CV126 (typical of 137 [HCUs]), opens with a scram signal to pressurize the lower side of the Control Rod Drive Mechanism (CRDM) pistons from the accumulator or from the charging water header. The CRD outlet isolation valve, CRD-AOV-CV127 (typical of 137 [HCUs]), opens with a scram signal to vent the top of the CRDM piston to the scram discharge header. The CRD scram outlet check valve, CRD-CV-114CV (typical of 137 [HCUs]), opens to allow flow from the top of the CRDM piston to the scram discharge header.

The applicable code requirements for these air-operated valves [CRD-AOV-CV126 and CRD-AOV-CV127] are that they be exercised open at the appropriate frequency per ISTC-3510, fail safe tested open per ISTC-3560, and stroke time tested open per ISTC-5131. The air-operated valves are adequately exercised and fail safe tested open during successful scram time testing for applicable control rod. The alternative being requested is to test these air-operated valves via control rod scram time testing in accordance with Technical Specification SR 3.1.4.1 and SR 3.1.4.2 [and SRs 3.1.4.3 and 3.1.4.4].* The stroke time testing per ISTC-5130 will not be performed.

The applicable code requirements for this check valve [CRD-CV-114CV] is that it be exercised open and closed per ISTC-5221(a) at a frequency determined by ISTC-3510. The check valve is adequately opened (safety function) with successful scram time testing and are not tested in the closed (non-safety function) direction. Therefore, the exercise testing in the non-safety direction per ISTC-5220 will not be performed. The alternative being requested is to test this check valve open via scram time testing in accordance with Technical Specification SR 3.1.4.1 and SR 3.1.4.2 [and SRs 3.1.4.3 and 3.1.4.4].* The reason for this request is that this approach is consistent with GL 89-04, Position 7, and NUREG 1482, Revision 1, Section 4.4.6.

In its submittals, the licensee stated that the proposed alternative will be utilized for the entire fourth 10-year IST interval.

3.2 NRC Staff Evaluation

The licensee has requested a proposed alternative testing program for certain valves found in the CRD HCU. There are 137 HCUs in the CRD system. Inlet and outlet scram valves CRD-AOV-CV126 and CRD-AOV-CV127, scram outlet check valve CRD-CV-114CV, CRD withdrawal/exhaust solenoid valves CRD-SOV-S0120, CRD-SOV-S0121, CRD-SOV-S0122, and CRD-SOV-S0123, and CRD cooling water header check valve CRD-CV-138CV represent only one each of 137 HCUs. The proposed alternative testing will apply to all HCUs and their associated valves.

The proposed alternative testing will be effective for the remainder of the CNS fourth 10-year IST interval, which began on March 1, 2006. The applicable Code of record for the CNS fourth 10-year IST interval is the ASME OM Code, 2001 Edition through 2003 Addenda.

Scram inlet valve CRD-AOV-CV126 and scram outlet valve CRD-AOV-CV127 are air-operated valves with an air to close – fail open design. Valve CRD-CV-114CV is a check valve located in the scram discharge riser line which is flow actuated as a result of CRD-AOV-CV127 opening. CRD withdrawal/exhaust solenoid valves CRD-SOV-S0120, CRD-SOV-S0121, CRD-SOV-S0122, and CRD-SOV-S0123 have a safety function to close in order to provide a

* In its supplemental letter dated November 18, 2009, the licensee revised RV-06 to include references to TS SRs 3.1.4.3 and 3.1.4.4, in addition to SRs 3.1.4.1 and 3.1.4.2, in the proposed alternative for the control rod scram time testing portion of the request. For more information, see Section 3.2 of this safety evaluation.

Class 2 to non-Code class boundary isolation. CRD cooling water header check valve CRD-CV-138CV has a safety function to close in the event of a scram. These valves are required to be tested in accordance with subsection ISTC of the ASME OM Code, 2001 Edition through 2003 Addenda. ASME OM Code paragraphs ISTC-3510, ISTC-3560, ISTC-5131(a), ISTC-5151(a), ISTC-5221(a)(1), and ISTC-5221(a)(2) are applicable to request for relief RV-06.

In lieu of ASME OM Code test requirements, the licensee requests testing the valves in accordance with CNS Technical Specification (TS) SR 3.1.3.2, SR 3.1.3.3, SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The NRC staff noted during its review that CNS TS SR 3.1.3.2 was deleted and SR 3.1.3.3 was revised by Amendment No. 235, dated November 12, 2009 (ADAMS Accession No. ML092960544). These changes did not affect the technical aspects of the CRD TS SRs or the NRC staff's conclusion with respect to RV-06.

NUREG-1482, Revision 1, Section 4.4.6, discusses the testing of the inlet and outlet scram valves (CRD-AOV-CV126 and CRD-AOV-CV127) and the scram outlet check valve (CRD-CV-114CV) found in CRD systems in boiling-water reactors (BWRs). Exercising these valves quarterly during power operations could result in rapid insertion of one or more control rods. Licensees should test CRD system valves at the Code-specified frequency. However, for those CRD system valves for which testing could result in rapid insertion of one or more control rods, the rod scram test frequency identified in the facility's TSs may be used as the valve testing frequency to minimize rapid reactivity transients and wear of the CRD mechanisms. The scram time testing frequency detailed in TS SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4 is an acceptable alternative method of detecting degradation of these valves and fully meets the recommendations of NUREG-1482, Revision 1, Section 4.4.6. Trending the stroke times of the inlet and outlet scram valves is unnecessary because they are indirectly stroke timed and no meaningful correlation between the scram time and valve stroke time can be obtained.

NUREG-1482, Revision 1, Section 4.4.6 also discusses the testing of the cooling water header check valve (CRD-CV-138CV) and CRD withdrawal/exhaust solenoid valves (CRD-SOV-S0120, CRD-SOV-S0121, CRD-SOV-S0122, and CRD-SOV-S0123) found in CRD systems in BWRs. Industry experience has shown that normal control rod motion may verify the cooling water header check valve and CRD withdrawal/exhaust solenoid valves moving to their safety function position. This is demonstrated because rod motion may not occur if these valves were to fail in the open position. Performance of TS SR 3.1.3.3 fully meets the recommendations of NUREG-1482, Revision 1.

4.0 CONCLUSION

Based on the above, the NRC staff determines that the licensee's proposed alternative testing in accordance with request RV-06, Revision 1, is consistent with NUREG-1482, Revision 1, and therefore is acceptable. The NRC staff concludes that the proposed alternative from the exercise frequency, actuator fail safe testing, and stroke time requirements detailed in ASME OM Code paragraphs ISTC-3510, ISTC-3560, ISTC-5131(a), ISTC-5151(a), ISTC-5221(a)(1), and ISTC-5221(a)(2) for the inlet and outlet scram valves, scram outlet check valve, withdrawal/exhaust solenoid valve, and the cooling water header check valve located on each CRD HCU provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i) and complies with the ASME OM Code requirements. Therefore, the

NRC staff authorizes the alternative in request RV-06, Revision 1, for the remainder of fourth 10-year IST interval, which began on March 1, 2006. All other ASME OM Code requirements for which relief was not specifically requested and approved remain applicable.

Principal Contributor: M. Farnan

Date: April 26, 2010

B. O'Grady

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The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please contact Mr. F. Lyon of my staff at (301) 415-2296 or via e-mail at fred.lyon@nrc.gov.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Safety Evaluation

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