November 28, 2001

Mr. Garry L. Randolph
Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, MO 65251

SUBJECT: RELIEF REQUEST AL-02 FOR THE INSERVICE TESTING PROGRAM AT CALLAWAY PLANT, UNIT 1 (TAC NO. MB2547)

Dear Mr. Randolph:

By letters dated July 24 and October 4, 2001 (ULNRC-04502 and -04534, respectively), you requested authorization to use an alternative to the inservice testing requirements of paragraph 4.3.2.4(b) of ASME/ANSI OMa-1988, Part 10, referenced by American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition, at the Callaway Plant, Unit 1.

Based on the enclosed safety evaluation (SE), the alternative proposed for the valves in Relief Request AL-02 is authorized for use at the Callaway Plant, Unit 1 pursuant to 10 CFR 50.55a(a)(3)(i), on the basis that it provides an acceptable level of quality and safety.

Sincerely,

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure: Safety Evaluation

cc w/encl: See next page

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DOCUMENT NAME: C:\Program Files\Adobe\Acrobat 4.0\PDF Output\MB2547-RR-AL-02.cw.wpd

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE TESTING PROGRAM - RELIEF REQUEST AL-02

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

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 ASME 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. Guidance is provided in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," and provides alternatives to the ASME Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

By letters dated July 24 and October 4, 2001, the Union Electric Company (the licensee) requested NRC approval of relief request AL-02 to implement an alternative to the testing requirements of paragraph 4.3.2.4(b) of the ASME/American National Standards Institute Operation and Maintenance Standard Addenda 1988 (i.e., ASME/ANSI OMa-1988), Part 10, referenced by ASME Code, Section XI, 1989 Edition, for certain check valves at the Callaway Plant. The IST check valve program at the Callaway Plant is required to meet the requirements of the ASME Code, Section XI, 1989 Edition. The licensee's proposed alternative is requested for use in its second 10-year interval IST program for the Callaway Plant.

2.0 LICENSEE'S RELIEF REQUEST

The licensee requests relief from the check valve mechanical exercising IST acceptance criteria of paragraph 4.3.2.4(b) of ASME/ANSI OMa-1988, Part 10, for certain check valves identified in Relief Request AL-02, at the Callaway Plant. The licensee requests NRC approval to implement an alternative acceptance criterion in lieu of the requirement in paragraph 4.3.2.4(b) that the mechanical exerciser force or torque used to initiate disc movement shall not vary by

more than 50 percent from the established reference value. The reference values are required to be determined from the results of tests performed under conditions expected during IST and when the valve is known to be operating acceptably.

2.1 Licensee's Basis for Relief

The check valves identified in Relief Request AL-02 have mechanical exercisers. In its request for relief of July 24, 2001, the licensee states that the valves are exercised to the full open position quarterly by measuring the opening breakaway torque. The acceptance criterion, that the breakaway torque shall not vary by more than 50 percent from an established reference value, has proven to be too stringent. This criterion is spuriously exceeded. However, degradation of the valves has not been detected when valve acceptance criterion violations are investigated. The breakaway torque variations exceed the acceptance criterion because of changes in packing friction and disc seating effectiveness.

2.2 Licensee's Proposed Alternative

The licensee proposes as an alternative that the identified check valves be exercised full stroke to the open position using the mechanical exerciser while adhering to the 1998 ASME Section XI acceptance criteria. The full stroke open test torque acceptance criteria will be a percentage of the calculated opening torque available due to system differential pressure while the system is in service.

3.0 EVALUATION

In Relief Request AL-02, the licensee indicates that the Callaway Plant IST check valve program for the identified valves are committed to compliance with the requirements of the ASME Code, Section XI, 1989 Edition, which references ASME/ANSI OM, Part 10, for IST of valves. The licensee requests relief for the identified valves from the acceptance criteria for mechanically exercised valves specified in ASME/ANSI OMa-1988, Part 10, paragraph 4.3.2.4(b). Relief is requested on the basis that the acceptance criterion is too stringent and is spuriously exceeded. Whenever these acceptance criteria violations are investigated, no valve degradation is detected, therefore, the licensee proposes to implement alternative acceptance criterion at the Callaway Plant.

The ASME/ANSI OMa-1988, Part 10, paragraph 4.3.2.4(b), consists of an integral two-part requirement: (1) The acceptance criterion requires that when a mechanical exerciser is used to move the obturator, the force or torque required to move the obturator shall not vary by more than 50 percent from the established reference value, and (2) the reference value must be determined from the results of testing performed under conditions as near as those expected during inservice testing when the valve is known to be operating acceptably.

Licensees have continuously experienced difficulty with the IST acceptance criteria for mechanically exercising valves as specified in ASME/ANSI OM, Part 10. This was one of the first issues addressed by the newly-organized OM Working Group on Check Valves (WGCV) of the ASME Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code) in 1993.

Mechanical exercisers for the check valves are attached to the hinge pin that is fixed to the disc and penetrate the valve body. Many of the mechanical exercisers involve swing check valves that manufacturers supplied with a valve counterweight modification. The counterweight is used to affect the opening or closing response of the disc to flow conditions, depending upon its location relative to the disc. The counterweight modification involves the use of a packing gland to seal the hinge pin penetration of the valve body. The seal packing introduces variations over time with regard to the required disc opening force and opening and closing response of the disc, depending upon the type of packing material used, its condition, friction changes, leakage control adjustments, and the packing gland tightening procedure. These variations make it difficult to establish a reference value that would be continually consistent and appropriate for use in IST to assess the condition of certain check valves.

The ASME OM WGCV proposed a change to the ASME OM Code requirements for the IST of check valves when using a mechanical exerciser. The change was approved by the OM Main Committee and Board on National Codes and Standards (BNCS) and published in the ASME OM Code-1998, Subsection ISTC, paragraph ISTC-5221 (b).

ISTC-5221 (b) states, "If a mechanical exerciser is used to exercise the valve, the force(s) or torque(s) required to move the obturator and fulfill its safety function(s) shall meet the acceptance criteria specified by the Owner.

(1) Exercise test(s) shall detect a missing obturator, sticking (closed or open), binding (throughout obturator movement), and the loss or movement of any weights. Both open and closed tests may not be required.

(2) Acceptance criteria shall consider the specific design, application, and historical performance.

(3) If impracticable to detect a missing obturator or loss or movement of any weight(s) using a mechanical exerciser, other positive means may be used (e.g., seat leakage tests and visual observations to detect obturator loss and the loss or movement of external weight(s), respectively)."

In a proposed rule (66 FR 40626) issued August 3, 2001, the NRC proposed to amend its regulations to incorporate by reference a recent edition and addenda of the ASME Code and the ASME OM Code to provide rules for construction, inservice inspection and inservice testing of components in light-water nuclear power plants. This proposed amendment includes the incorporation by reference of the ASME OM Code-1998. In the proposed rule, paragraph ISTC-5221(b) of this ASME OM Code is included with no proposed modification nor limitations imposed.

Based on discussions between the licensee and staff, the licensee modified its proposed alternative in its supplemental letter of October 4, 2001. The modified alternative reads as follows:

> Exercise check valves (full stroke) to the open position using a mechanical exerciser while adhering to the ASME OM Code-1998, paragraph ISTC-5221(b).

Based on its evaluation of the requested relief for the identified valves and the implementation of the modified alternative, the staff finds that the use of the modified alternative for IST of the valves when applying a mechanical exerciser provides an acceptable level of quality and safety.

4.0 CONCLUSION

The NRC staff concludes that the alternative proposed by the licensee, as described herein, for the valves in Relief Request AL-02 is authorized for use at the Callaway Plant, pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety.

Principal Contributor: Frank Grubelich

Date: November 28, 2001