September 18, 2008

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SUBJECT: FINAL SUPPLEMENT TO SAFETY EVALUATION FOR JOINT OWNERS' GROUP MOTOR-OPERATED VALVE PERIODIC VERIFICATION PROGRAM (TAC NOS. MD8920 AND MD8921)

Gentlemen:

By letter dated June 20, 2007, the Joint Owners' Group (JOG) submitted revised pages to topical report (TR) MPR-2524, "Joint Owners' Group Motor Operated Valve Periodic Verification Program Summary," to the U.S. Nuclear Regulatory Commission (NRC) NRC staff for review. By letter dated August 14, 2008, an NRC draft safety evaluation (SE) regarding our approval of the revised pages to TR MPR-2524 was provided for your review and comments. By e-mail dated August 28, 2008, the JOG commented on the draft SE. The NRC staff's disposition of JOG's comments on the draft SE are discussed in the attachment to the final SE enclosed with this letter.

The NRC staff has found that the revised pages to TR MPR-2524 are acceptable for referencing in licensing applications for light water reactors to the extent specified and under the limitations delineated in the TR and in the enclosed final SE. The final SE defines the basis for our acceptance of the TR.

Our acceptance applies only to material provided in the subject TR. We do not intend to repeat our review of the acceptable material described in the TR. When the TR appears as a reference in license applications, our review will ensure that the material presented applies to the specific plant involved. License amendment requests that deviate from this TR will be subject to a plant-specific review in accordance with applicable review standards.

In accordance with the guidance provided on the NRC website, we request that JOG publish an accepted version of this TR within three months of receipt of this letter. The accepted version shall incorporate this letter and the enclosed final SE after the title page. Also, it must contain historical review information, including NRC requests for additional information and your

responses. The accepted version shall include an "-A" (designating accepted) following the TR identification symbol. If future changes to the NRC's regulatory requirements affect the acceptability of this TR, the JOG and/or licensees referencing it will be expected to revise the TR appropriately, or justify its continued applicability for subsequent referencing.

Sincerely,

/RA/

Thomas B. Blount, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project Nos. 691 and 694

Enclosure: Final Supplement to SE

cc w/encl: See next page

responses. The accepted version shall include an "-A" (designating accepted) following the TR identification symbol. If future changes to the NRC's regulatory requirements affect the acceptability of this TR, the JOG and/or licensees referencing it will be expected to revise the TR appropriately, or justify its continued applicability for subsequent referencing.

Sincerely,

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Thomas B. Blount, Deputy Director
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ADAMS ACCESSION NO.: ML082480638 *No major changes to SE input. NRR-043

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FINAL SUPPLEMENT TO SAFETY EVALUATION ON JOINT OWNERS' GROUP PROGRAM ON PERIODIC VERIFICATION ON DESIGN-BASIS CAPABILITY OF SAFETY-RELATED MOTOR-OPERATED VALVES

1.0 INTRODUCTION

In response to Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves" (Reference 1), nuclear power plant licensees developed an industry-wide Joint Owners' Group (JOG) program on motor-operated valve (MOV) periodic verification. The JOG prepared an initial topical report (TR) describing the program, which the U.S. Nuclear Regulatory Commission (NRC) NRC staff approved in a safety evaluation (SE) dated October 30, 1997 (Reference 2). The NRC staff relied on licensee commitments to the JOG program in closing its review of GL 96-05 programs at the participating nuclear power plants. On February 27, 2004, the JOG submitted the final TR MPR-2524, "Joint Owners' Group Motor Operated Valve Periodic Verification Program Summary" (Reference 3) for NRC staff review. By letter dated September 25, 2006 (Reference 4), the NRC staff approved MPR-2524 in an SE that discussed its review of the JOG program on MOV periodic verification described in the final JOG TR. By letter dated December 11, 2006, the JOG issued MPR-2524-A, "Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary" (Reference 5), that incorporated the NRC staff SE and JOG responses to NRC staff requests for additional information. By letter dated June 20, 2007 (Reference 6), the JOG provided revised pages to MPR-2524-A, that reflect corrected input design data for a valve tested as part of the JOG program.

The revised pages to the JOG MOV periodic verification summary TR provided in Reference 6, are the result of a re-evaluation of the design of a butterfly valve (JOG Valve B22.4) tested at a nuclear power plant as part of the JOG program. Following issuance of the Reference 5, the JOG determined that the subject butterfly valve has a double offset disk design rather than the single offset bearing design. Based on its re-analysis, the JOG has revised the applicable pages in the JOG MOV periodic verification summary TR to reflect the corrected maximum bearing friction coefficient and test results for JOG Valve B22.4. In Reference 6, the JOG stated that the revised information had been distributed to the JOG participants with only one nuclear power plant licensee reporting use of this type of butterfly valve.

2.0 REGULATORY EVALUATION

The NRC regulations require that components that are important to the safe operation of a nuclear power plant be treated in a manner that provides adequate assurance that they will satisfactorily perform their safety functions. Appendix A, "General Design Criteria for Nuclear Power Plants," and Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) contain broadly based requirements for these nuclear power plant components. The regulation at 10 CFR 50.55a requires nuclear power plant licensees to implement provisions of the American Society of Mechanical Engineers (ASME) Code for testing of MOVs as part of their integrated surveillance testing (IST) programs. In 1999, the NRC revised 10 CFR 50.55a to

incorporate by reference the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code). The NRC also supplemented the quarterly MOV stroke-time testing specified in the ASME OM Code by requiring licensees that have the ASME OM Code as their code of record to establish a program to ensure that MOVs continue to be capable of performing their design-basis safety functions.

In 1996, the NRC issued GL 96-05 to provide detailed guidance for the periodic verification of MOV design-basis capability in response to MOV performance issues at operating nuclear power plants. In GL 96-05, the NRC staff asked licensees to establish a program, or ensure the effectiveness of the current program, to verify on a periodic basis that safety-related MOVs continue to be capable of performing their safety functions within the current licensing basis of the facility. The NRC staff applied lessons learned from industry and NRC valve testing programs, and MOV inspections at nuclear power plants, in reviewing the industry-wide JOG Program on MOV Periodic Verification developed in response to GL 96-05. In Reference 4, the NRC staff concluded that the JOG Program on MOV Periodic Verification provides an acceptable industry-wide response to GL 96-05 for valve age-related degradation if implemented in accordance with the SE.

The NRC has reviewed the revised pages of the JOG MOV Periodic Verification Summary Report provided by the JOG in a letter dated June 20, 2007, for consistency with the regulatory evaluation in Reference 4. The NRC staff has determined that the regulatory evaluation for the JOG program continues to be applicable for the periodic verification of the design-basis capability of the MOVs with the revised information in accordance with the GL 96-05 recommendations for valve age-related degradation.

3.0 TECHNICAL EVALUATION

The revised pages to the JOG MOV periodic verification summary TR provided in Reference 6 are the result of a re-evaluation of the design of a butterfly valve (JOG Valve B22.4) tested at a nuclear power plant as part of the JOG program. Following issuance of the TR, the JOG determined that the subject butterfly valve has a double offset disk design rather than the single offset bearing design. With the correct disk design, the JOG reanalyzed the test data for this valve. The JOG determined that the maximum observed coefficient of friction for the butterfly valve bearing made of Tefzel was 0.31 rather than 0.23 specified in the original TR.

Based on its re-analysis, the JOG has revised the applicable pages in the JOG MOV periodic verification summary TR to reflect the corrected maximum bearing friction coefficient and test results for JOG Valve B22.4. Although the bearing friction coefficient increased when applying the correct disk design, the JOG has not modified the program conclusions regarding the stability of the bearing coefficient of friction for butterfly valves. In Reference 6, the JOG stated that the revised information had been distributed to the JOG participants with only one nuclear power plant licensee reporting use of this type of butterfly valve. The JOG planned to prepare Revision B to MPR-2524 to reflect the revised information.

Based on sound engineering judgment, the NRC staff considers the re-calculated bearing coefficient of friction for JOG Valve B22.4 to remain a reasonable value for bearing coefficient of friction for the subject butterfly valve. Furthermore, the data from the repetitive tests of Valve B22.4 as part of the JOG program continue to indicate stability of the bearing friction coefficient for this valve although at a higher friction value. Therefore, the NRC staff finds that

the re-analysis of the bearing coefficient of friction for Valve B22.4 does not change the conclusions of its review of the JOG MOV Periodic Verification Program discussed in the SE dated September 25, 2006.

4.0 CONCLUSION

The NRC staff has reviewed the revised pages from the JOG MOV periodic verification summary TR (Reference 6). Based on its review of the revised pages to the JOG TR, the SE dated September 25, 2006, and this SE supplement, the NRC staff continues to conclude that the JOG program on MOV periodic verification provides an acceptable industry-wide response to GL 96-05 for valve age-related degradation when implemented in accordance with the SE and this supplement.

As discussed in the SE dated September 25, 2006, licensees are responsible for implementing the applicable conditions in the SE on the JOG program description TR and the findings of the SE (including this supplement) on the JOG TR. Where a licensee that has committed to implement the JOG program as part of its response to GL 96-05 identifies safety-related MOVs or its application that are outside the scope of the JOG program, the NRC staff expects the licensee to notify the NRC staff of its plans for periodically verifying the design-basis capability of those MOVs in accordance with its commitments to GL 96-05.

5.0 REFERENCES

1. NRC Generic Letter 96-05, “Periodic Verification of the Design-Basis Capability of Safety-Related Motor-Operated Valves,” September 18, 1996. (ADAMS Accession No. ML031110010)

2. NRC Staff Safety Evaluation of JOG Topical Report MPR-1807, dated October 30, 1997. (ADAMS Accession No. 9801160151)

3. JOG Topical Report MPR-2524 (Rev. 0, February 2004), “Joint Owners' Group Motor Operated Valve Periodic Verification Program Summary,” February 27, 2004.

4. NRC Staff Final Safety Evaluation of JOG Program On Motor-Operated Valve Periodic Verification, dated September 25, 2006. (ADAMS Accession No.ML061280315)

5. JOG MPR-2524-A (November 2006), “Joint Owners’ Group (JOG) Motor Operated Valve Periodic Verification Program Summary,” dated December 11, 2006. (ADAMS Accession No. ML063490194)

6. Revised pages to JOG Topical Report MPR-2524, dated June 20, 2007. (ADAMS Accession No. ML071730468)

Attachment: Resolution of Comments

Principal Contributor: T. Scarbrough

Date: September 18, 2008

Resolution of Comments

By e-mail dated August 28, 2008, the Joint Owners' Group (JOG) commented on the draft supplement to the safety evaluation (SE) for JOG motor-operated valve periodic verification program issued on August 14, 2008. The U.S. Nuclear Regulatory Commission (NRC) staff's disposition of each JOG comment on the draft SE is discussed in the table below.

	JOG Comment	NRC Disposition
1	Page 2, Line 35: The bearing is Tefzel, not Teflon.	Replaced "a Teflon derivative" with "Tefzel."
2	Page 2, lines 3,4,5,6 – We would prefer that these sentences be removed OR it should say exactly what is in 10CFR50.55a. The code says that "licensees shall establish a program to ensure that motor-operated valves continue to be capable of performing their design basis safety functions." The current wording is an expansion of what is in 10 CFR 50.55a.	Replaced "verify the design-basis capability of MOVs within the scope of the ASME Code on a periodic basis," with "establish a program to ensure that MOVs continue to be capable of performing their design-basis safety functions."
3	Page 1, Line 30 and Page 2, Line 34: The original determination of bearing COF was based upon a single offset design. The Single Offset Bearing Design is the standard butterfly valve design in the JOG topical report, not a symmetric design as stated in the SE. However, it makes no difference in bearing COF determination because both designs use the same COF equation.	Replaced "standard symmetric design" with "single offset bearing design" at both locations.

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