August 14, 2008

Mr. Doug Coleman, Chair
BWR Owners' Group
Energy Northwest
Columbia Generating Station
Mail Drop PE20
P.O. Box 968
Richland, WA 99352-0968

Mr. Dennis Buschbaum, Chair
PWR Owners' Group
Comanche Peak Steam Electric Station
6322 North Farm to Marked Rd 56
Mail Code E15
Glen Rose, TX 76043

SUBJECT: DRAFT 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 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. Enclosed for Joint Owners' Group review and comment is a copy of the NRC staff's draft supplement to the safety evaluation (SE) for the TR.

Twenty working days are provided to you to comment on any factual errors or clarity concerns contained in the SE. The final SE will be issued after making any necessary changes and will be made publicly available. The NRC staff's disposition of your comments on the draft SE will be discussed in the final SE.

To facilitate the NRC staff's review of your comments, please provide a marked-up copy of the draft SE showing proposed changes and provide a summary table of the proposed changes. If you have any questions, please contact Michelle Honcharik at (301) 415-1774.

Sincerely,

**/RA/**

Stacey L. Rosenberg, Chief
Special Projects Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project Nos. 691 and 694

Enclosure: Draft Supplement to SE

cc w/encl: See next page

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Mail Drop PE20
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| OFFICE | PSPB/PM | PSPB/PM | PSPB/LA | CPTB/BC* | PSPB/BC |
|---|---|---|---|---|---|
| NAME | EBowman | MHoncharik | DBaxley | JMcHale | SRosenberg |
| DATE | 6/12/08 | 8/13/08 | 7/29/08 | 11/19/2007 | 08/14/08 |

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# DRAFT 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 standard symmetric 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 verify the design-basis capability of MOVs within the scope of the ASME Code on a periodic basis.

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 standard symmetric 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 a Teflon derivative 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)

Principal Contributor: T. Scarbrough

Date: August 14, 2008

Mr. Richard Libra
Executive Vice Chair, BWR Owners' Group
Exelon Generation Co, LLC
200 Exelon Way
Mail Code KSA 2-N
Kennett Square, PA 19348
Rick.libra@exeloncorp.com

Mr. Richard Anderson
BWROG, Executive Chair
FPL Energy (DAEC)
Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324
richard_l_anderson@fpl.com

Mr. James F. Klapproth
GE-Hitachi Nuclear Energy
M/C A50
3901 Castle Hayne Road
Wilmington, NC 28401
james.klapproth@ge.com

Mr. Joseph E. Conen, Vice Chair
Regulatory Response Group
BWR Owners' Group
DTE Energy-Fermi 2
200 TAC
6400 N. Dixie Highway
Newport, MI 48166
conenj@dteenergy.com

Dennis Madison, Hatch Vice President
Southern Nuclear Operating Co.
11028 Hatch Parkway North
Baxley, GA 31515-2010
drmadiso@southernco.com

Frederick Emerson
BWROG, Project Manager
Frederick.emerson@ge.com

Mr. Ken A. McCall, Program Manager
GE-Hitachi Nuclear Energy
M/C F12
3901 Castle Hayne Road
Wilmington, NC 28401
kenneth.mccall@ge.com

Oscar Limpias
Entergy Nuclear Northeast
1340 Echelon Parkway.
Jackson, MS 39213-8202
olimpia@entergy.com

Joe Donahue
Progress Energy Inc.
410 S. Wilmington St.
PEB 6A
Raleigh, NC 27601-1849
joe.w.donahue@pgnmail.com

Paul J. Davison
Hope Creek Generating Station
P.O. Box 236
Hancocks Bridge, NJ 08038
paul.davison@pseg.com

Mr. Ted Schiffley
Vice Chairman, BWROG
Exelon Generation Co., LLC.
Cornerstone II at Cantera
4300 Winfield Road
Warrenville, IL 60555
frederick.schiffley@exeloncorp.com

Mr. Randy C. Bunt, Chair
Regulatory Response Group
Southern Nuclear Operating Company
40 Inverness Center Parkway/Bin B057
Birmingham, AL 35242
rcbunt@southernco.com

cc:
Mr. James A. Gresham, Manager
Regulatory Compliance and Plant Licensing
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355
greshaja@westinghouse.com

Gordon Bischoff, Manager
Owners Group Program Management Office
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355
gordon.c.bischoff@us.westinghouse.com