

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
OFFICE OF NEW REACTORS
WASHINGTON, DC 20555-0001

January 6, 2012

**NRC REGULATORY ISSUE SUMMARY 2011-13
FOLLOW UP TO GENERIC LETTER 96-05
FOR EVALUATION OF CLASS D VALVES UNDER JOINT OWNERS
GROUP MOTOR-OPERATED VALVE PERIODIC VERIFICATION
PROGRAM**

ADDRESSEES

All holders of, and applicants for, power reactor operating licenses under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," except those that have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

All holders of, and applicants for, a combined license (COL) to construct and operate a nuclear power plant under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

INTENT

The U.S. Nuclear Regulatory Commission (NRC or Commission) is issuing this regulatory issue summary (RIS) to inform applicants for and holders of licenses for nuclear power plants that plan to implement, or are currently implementing, the Joint Owners Group (JOG) Motor-Operated Valve (MOV) Periodic Verification Program developed in response to NRC Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves," dated September 18, 1996, of updates on the implementation of this generic letter. In particular, this RIS discusses one acceptable approach for applicable applicants and licensees to address MOVs or their operating conditions at nuclear power plants that are outside the scope of the JOG program (identified by the JOG program as Class D valves). This RIS requires no action or written response on the part of any addressee.

BACKGROUND INFORMATION

On June 28, 1989, the NRC issued GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," in response to performance concerns with MOVs at nuclear power plants. In GL 89-10, the NRC staff requested that each nuclear power plant licensee establish a program to demonstrate that safety-related MOVs are capable of performing their design-basis functions. Licensees of all operational nuclear power plants implemented a program in response to GL 89-10 that included extensive testing and analyses of their safety-related MOVs. Based on a series of inspections, the NRC staff closed its review of the GL 89-10 program at each nuclear power plant. The NRC issued GL 96-05 to provide recommendations to nuclear power plant licensees for ensuring the long-term capability of safety-related MOVs to perform their

design-basis functions. In GL 96-05, the NRC staff requested licensees to establish a program, or ensure the effectiveness of their current program, to periodically verify that safety-related MOVs continue to be capable of performing their safety functions within the current licensing basis of the facility. The provisions in GL 96-05 superseded the long-term aspects of GL 89-10.

In response to GL 96-05, the individual boiling-water reactor and pressurized-water reactor owners groups established the JOG program to share information on MOV performance among nuclear power plant licensees. Each nuclear power plant licensee submitted a planned response to GL 96-05 that describes its program to periodically verify the design-basis capability of safety-related MOVs. Most nuclear power plant licensees committed to implement the JOG program as part of their response to GL 96-05. The NRC staff reviewed the GL 96-05 submittals from each licensee and conducted inspections of the GL 96-05 programs at a sample of nuclear power plants. Based on its review of the initial submittals, follow-up submittals based on staff questions, and sample inspections, the NRC staff prepared a safety evaluation (SE) of the GL 96-05 program described by each licensee, including, as applicable, the implementation of the JOG program.

The JOG program included the following three phases:

- (1) an interim plan of static diagnostic testing of safety-related MOVs at a frequency based on risk and margin;
- (2) a JOG testing program to evaluate potential valve degradation whereby each participating licensee performed three static and dynamic diagnostic tests on two selected valves over a 5-year period with a minimum of 1 year between tests; and
- (3) a long-term plan of static diagnostic testing and, where necessary, dynamic diagnostic testing based on the JOG's evaluation of the valve performance data from the 5-year testing program.

The JOG program tested over 150 different gate, globe, and butterfly valves in various applications, such as treated water, untreated water, hot water, cold water, and steam. The test results concluded that valves perform the same when they share the same attributes, such as valve type, fluid application, disk to seat material, disk to body material, and bearing material. The JOG program classified MOVs at nuclear power plants on the basis of their attributes and performance as follows:

- Class A. Class A valves are valves within the scope of the JOG program that have been determined not to be susceptible to degradation in their operating requirements based directly on testing performed in the JOG program or on other suitable bases as discussed in the JOG program.
- Class B. Class B valves are valves within the scope of the JOG program that have been determined not to be susceptible to degradation in their operating requirements based on testing performed in the JOG program, extended by analysis or engineering judgment to configurations and conditions beyond those tested.
- Class C. Class C valves are valves within the scope of the JOG program that have been determined to be susceptible to changes in the required thrust or torque based on the test results from the JOG program.

- Class D. Class D valves are valves that are determined to be outside the scope of the JOG program but within the scope of GL 96-05.

On February 27, 2004, the JOG submitted its topical report MPR-2524, "Joint Owners Group (JOG) Motor-Operated Valve Periodic Verification Program Summary" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML040720092), to the NRC for review. MPR-2524 describes long-term MOV periodic verification recommendations that licensees committed to the JOG program can use as part of their response to GL 96-05. The JOG program addresses potential degradation in required thrust or torque for safety-related gate, butterfly, balanced disk globe, and unbalanced disk globe valves. The JOG program does not cover potential degradation in actuator output thrust or torque. The JOG program indicated that each individual licensee is responsible for the potential degradation of actuator capability.

By letter dated September 25, 2006, the NRC staff approved MPR-2524, with conditions, in an SE entitled, "Final Safety Evaluation on Joint Owners' Group Program on Motor-Operated Valve Periodic Verification" (ADAMS Accession No. ML061280315). By letter dated December 11, 2006, the JOG issued MPR-2524-A, "Joint Owners' Group (JOG) Motor-Operated Valve Periodic Verification Program Summary" (ADAMS Accession No. ML063470526), which incorporates the NRC staff's SE and JOG responses to NRC requests for additional information. By letter dated June 20, 2007, entitled, "Joint Owners' Group Motor-Operated Valves Periodic Verification Program Revised Data for Valve B22.4 for Review and Acceptance" (ADAMS Accession No. ML071730468), the JOG provided revised pages to MPR-2524-A that reflect corrected input design data for a valve that was tested as part of the JOG program. By letter dated September 18, 2008, the NRC staff issued an SE entitled "Final Supplement to Safety Evaluation for Joint Owners' Group Motor-Operated Valve Periodic Verification Program" (ADAMS Accession No. ML082480638), on the revised pages to MPR-2524-A. Thereafter, the NRC staff closed its review of the GL 96-05 program at each nuclear power plant.

In the SE dated September 25, 2006, the NRC staff stated that it considers the JOG program to be an acceptable approach for addressing GL 96-05 issues with the conditions described in the SE. In the SE, the staff noted that the JOG proposed an implementation schedule of 6 years for the long-term JOG program following issuance of the SE. The staff considered this proposed schedule reasonable provided that the licensees continued to address any identified issues related to MOV operability in accordance with NRC regulatory requirements. The staff stated that it expected licensees to notify the NRC of deviations from the JOG program (including the implementation schedule) in accordance with their commitments to GL 96-05.

The staff also noted in the September 25, 2006, SE that the final implementation of the JOG program will require classification of safety-related MOVs based on their physical construction, application service condition, and design test information. Once classified, the valves will be placed into the final test matrix that is based on risk and margin. For those valves (or their operating conditions) identified as outside the scope of the JOG program (Class D valves), the NRC staff stated that licensees are responsible for developing a separate MOV periodic verification program that satisfies GL 96-05. The staff indicated that it expected licensees committed to implementing the JOG program, as part of their response to GL 96-05, to notify the NRC of their plans to periodically verify the design-basis capability of JOG Class D MOVs.

Subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants," of the American Society of Mechanical Engineers (ASME) *Operation and Maintenance of Nuclear Power Plants* (ASME OM Code) establishes requirements for preservice testing and inservice

testing (IST), and for the examination of valves to assess their operational readiness in light-water reactor nuclear power plants. These requirements apply to valves that must perform a specific function in shutting down a reactor to the safe-shutdown condition, in maintaining the safe-shutdown condition, or in mitigating the consequences of an accident. Based on operating experience at nuclear power plants and on industry and NRC research programs, the NRC determined that the quarterly stroke-time testing provisions specified in the ASME OM Code (before the 2009 edition) and previously in Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the *ASME Boiler and Pressure Vessel Code* (ASME B&PV Code) were not adequate to assess the operational readiness of safety-related MOVs at nuclear power plants. The NRC issued GL 89-10 and GL 96-05, in part, to augment the requirements in the ASME OM and B&PV Codes to fully ensure that these valves were capable of performing their design-basis safety functions.

When the NRC updated the regulations in 10 CFR 50.55a, "Codes and Standards," to incorporate by reference the ASME OM Code, it established a condition in 10 CFR 50.55a(b)(3)(ii) to supplement the quarterly stroke-time testing provisions for MOVs in the ASME OM Code. In 10 CFR 50.55a(b)(3)(ii), the NRC requires licensees to supplement the ASME OM Code MOV testing provisions by establishing a program to ensure that safety-related MOVs continue to be capable of performing their design-basis safety functions. As a result, the condition in 10 CFR 50.55a(b)(3)(ii) consists of the following two elements for licensees that are currently implementing the ASME OM Code:

- (1) Licensees must meet the ASME OM Code IST requirements for MOVs.
- (2) Licensees must establish a program that ensures the capability of MOVs to perform their design-basis safety functions.

In response to the additional requirements from the NRC beyond quarterly MOV stroke-time testing, ASME developed Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants OM Code-1995, Subsection ISTC." ASME Code Case OMN-1 allows for the replacement of the quarterly stroke-time testing provisions in the ASME OM Code through exercise of the MOVs up to a refueling outage frequency and periodic diagnostic testing on a longer interval based on a mix of static and dynamic test data. The NRC has accepted ASME Code Case OMN-1, with conditions, in Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 0, issued in June 2003.

ASME has incorporated Code Case OMN-1 as Mandatory Appendix III, "Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants," in the 2009 edition of the ASME OM Code to replace quarterly MOV stroke-time testing with periodic exercising and diagnostic testing of all applicable MOVs. The NRC regulations in 10 CFR 50.55a(f)(4)(ii) require licensees at operating nuclear power plants to update their IST programs every 10 years to the latest edition and addenda of the ASME OM Code, which is incorporated by reference in 10 CFR 50.55a(b). As a result, all plants will eventually implement Mandatory Appendix III to the ASME OM Code. The NRC is currently reviewing the 2009 edition of the ASME OM Code for incorporation by reference in 10 CFR 50.55a.

In the *Federal Register* notice dated September 22, 1999 (64 FR 51370, 51376-77), the NRC discussed the option of nuclear power plant licensees using ASME Code Case OMN-1 with

conditions to meet the requirement in 10 CFR 50.55a(b)(3)(ii) to establish a program to ensure that safety-related MOVs continue to be capable of performing their design-basis safety functions. The NRC staff continues to consider that ASME Code Case OMN-1, as accepted with conditions in RG 1.192, is an adequate approach for establishing a program to ensure that safety-related MOVs continue to be capable of performing their design-basis safety functions in compliance with 10 CFR 50.55a(b)(3)(ii). The staff also considers the use of ASME Code Case OMN-1, as accepted in RG 1.192, to satisfy the recommendations of GL 96-05 for periodic verification of the design-basis capability of safety-related MOVs at nuclear power plants that are outside the scope of the JOG program (i.e., JOG Class D valves). The staff may augment future inspections of MOV programs to review how licensees have addressed GL 96-05 and JOG Class D valves at nuclear power plants.

The NRC staff is reviewing the descriptions of the IST program and the MOV testing program that COL applicants have submitted for new nuclear power plants under 10 CFR Part 52. Most COL applicants have specified that they will implement the JOG program as part of the description of their IST program and MOV testing program. The NRC staff is preparing SEs that describe the review of the COL applications, including the planned implementation of the JOG program. The NRC staff will conduct inspections of the operational programs for new nuclear power plants, including the IST program and MOV testing program, during plant construction and operation. Those inspections may include evaluation of COL licensee action for JOG Class D valves as applicable.

SUMMARY OF ISSUE

For applicants for and holders of licenses for nuclear power plants that plan to implement, or are currently implementing, the JOG program as part of their response to GL 96-05, the NRC staff describes one acceptable approach (as indicated below) for those applicants and licensees to address their commitments to GL 96-05 with respect to periodic verification of the design-basis capability of safety-related MOVs determined to be JOG Class D valves:

- Applicants or licensees that have determined that their nuclear power plants do not contain any safety-related MOVs (or operating conditions) that are outside the scope of the JOG program would not notify the NRC staff of their findings on JOG Class D valves.
- Applicants or licensees that are currently applying ASME Code Case OMN-1, as accepted in RG 1.192, to JOG Class D valves as part of their response to GL 96-05 need not notify the NRC staff of their application of Code Case OMN-1. As noted above, the NRC staff considers the provisions in ASME Code Case OMN-1, as accepted in RG 1.192, to satisfy the regulatory requirement in 10 CFR 50.55a(b)(3)(ii) and the recommendations in GL 96-05 for periodic verification of MOV design-basis capability.
- Applicants or licensees that have identified JOG Class D valves (or operating conditions) at their plants and have chosen not to implement ASME Code Case OMN-1 (as accepted in RG 1.192) are required by 10 CFR 50.55a(b)(3)(ii) to establish a program to ensure that those safety-related MOVs continue to be capable of performing their design-basis safety functions. The NRC staff considers the section entitled, "Guidance for Valves in Class D," in Section 7 of MPR-2524-A a good starting point for establishing an approach to periodically verify the design-basis capability of safety-related MOVs that are not covered by the JOG program. Consistent with their commitments to implement the JOG program in response to GL 96-05, applicants and licensees should apply

RIS 2000-017, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," which indicates that Nuclear Energy Institute (NEI) 99-04, "Guidelines for Managing NRC Commitment Changes," describes an acceptable way for licensees to control regulatory commitments. As clarification of the discussion at the public meeting on August 17, 2011, applicants and licensees should follow their administrative procedures for appropriate notification of the NRC staff of changes to their commitments to GL 96-05. Applicants and licensees should meet their commitments in accordance with NEI 99-04. However, no regulation requires licensees to submit, to the NRC, their programs (or changes to their programs) established to ensure MOVs continue to be capable of performing their design-basis safety functions.

For applicants and licensees that will implement the 2009 edition of the ASME OM Code, the NRC staff considers the application of Mandatory Appendix III to the ASME OM Code, when incorporated by reference in 10 CFR 50.55a with any specified conditions, an acceptable approach for the periodic verification of the design-basis capability of safety-related MOVs. Therefore, the implementation of Mandatory Appendix III to the ASME OM Code, when incorporated by reference in 10 CFR 50.55a with any applicable conditions, will satisfy the requirement in 10 CFR 50.55a(b)(3)(ii) to establish a program to ensure that MOVs continue to be capable of performing their design-basis safety functions. In addition, the implementation of Mandatory Appendix III to the ASME OM Code, when incorporated by reference in 10 CFR 50.55a with any applicable conditions, will satisfy the recommendations of GL 96-05 for the periodic verification of the design-basis capability of safety-related MOVs, including JOG Class D valves.

BACKFIT DISCUSSION

The staff is not imposing any new or changed positions or regulatory requirements on licensees that constitute backfitting as defined in 10 CFR 50.109(a)(1), nor is it proposing new or changed guidance that should be regarded as backfitting under Commission and Executive Director for Operations guidance. This RIS does not require action on the part of any licensee. Therefore, this RIS does not constitute a backfit under 10 CFR 50.109, "Backfitting." Consequently, the staff did not perform a backfit analysis.

FEDERAL REGISTER NOTIFICATION

Although this RIS is informational and pertains to a staff position that does not represent a departure from current regulatory requirements and practice, the NRC did hold a public meeting on August 17, 2011, which included discussions on this RIS and periodic verification program strategies for JOG Class D valves. The meeting summary is available in ADAMS at Accession No. ML112430273.

CONGRESSIONAL REVIEW ACT

The NRC has determined that this RIS is not a rule as designated by the Congressional Review Act (5 U.S.C. 801–808) and, therefore, is not subject to the Act.

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain new or amended information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget (OMB), approval number 3150-0011 and 3150-0151.

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Please direct any questions about this matter to the technical contacts listed below or to the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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