December 11, 2000

Mr. William A. Eaton
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - RE: CLOSEOUT OF GENERIC LETTER 96-05 (TAC NO. M97051)

Dear Mr. Eaton:

On September 18, 1996, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves," requesting each nuclear power plant licensee to establish a program, or to ensure the effectiveness of its current program, to verify on a periodic basis that safety-related motor-operated valves (MOVs) continue to be capable of performing their safety functions within the current licensing bases of the facility.

On November 15, 1996, Entergy Operations, Inc., (EOI) submitted a 60-day response to GL 96-05 notifying the NRC that it was preparing a MOV periodic verification program at Grand Gulf Nuclear Station, Unit 1 (GGNS). On March 17, 1997, EOI submitted a 180-day response to GL 96-05 providing a summary description of the MOV periodic verification program to ensure the long-term design-basis capability of the safety-related MOVs within the scope of GL 96-05 at GGNS, and in a letter dated January 11, 1999, EOI updated its commitment to GL 96-05. On April 2, 1999, EOI provided a response to a request for additional information regarding GL 96-05, forwarded by the NRC staff on February 1, 1999. In a letter dated May 13, 1999, EOI provided additional information superceding its letter dated April 2, 1999. In letters dated February 29 and March 30, 2000, EOI described its MOV risk-ranking methodology and provided a summary of the MOV risk-ranking results for GGNS.

After review of the submittals and applicable NRC inspection reports for the MOV program at GGNS, we find that EOI has established an acceptable program to periodically verify the design-basis capability of the safety-related MOVs at GGNS through its commitment to all three phases of the Joint Owners Group (JOG) Program on MOV Periodic Verification and the additional actions described in its submittals. As discussed in the attached safety evaluation (SE), it is concluded that EOI is adequately addressing the actions requested in GL 96-05. The NRC staff may conduct inspections at GGNS to verify that the implementation of the MOV periodic verification program is in accordance with EOI's commitments in its submittals, this NRC SE, and the NRC SE dated October 30, 1997, on the JOG Program on MOV Periodic Verification.

This completes the NRC's efforts on TAC No. M97051.

Sincerely,

/RA/

S. Patrick Sekerak, Project Manager
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure: Safety Evaluation

cc w/encl: See next page

This completes the NRC's efforts on TAC No. M97051.

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S. Patrick Sekerak, Project Manager
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

LICENSEE RESPONSE TO GENERIC LETTER 96-05, "PERIODIC VERIFICATION OF DESIGN-BASIS CAPABILITY OF SAFETY-RELATED MOTOR-OPERATED VALVES,"

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NUMBER 50-416

1.0 INTRODUCTION

Many fluid systems at nuclear power plants depend on the successful operation of motor-operated valves (MOVs) in performing their safety functions. Several years ago, MOV operating experience and testing, and research programs sponsored by the nuclear industry and the U. S. Nuclear Regulatory Commission (NRC), revealed weaknesses in a wide range of activities (including design, qualification, testing, and maintenance) associated with the performance of MOVs in nuclear power plants. For example, some engineering analyses used in sizing and setting MOVs did not adequately predict the thrust and torque required to operate valves under their design-basis conditions. In addition, inservice tests of valve stroke time under zero differential-pressure and flow conditions did not ensure that MOVs could perform their safety functions under design-basis conditions.

Upon identification of the weaknesses in MOV performance, significant industry and regulatory activities were initiated to verify the design-basis capability of safety-related MOVs in nuclear power plants. After completion of these activities, nuclear power plant licensees began establishing long-term programs to maintain the design-basis capability of their safety-related MOVs. This safety evaluation (SE) addresses the program developed by Entergy Operations, Inc., (licensee) to verify periodically the design-basis capability of safety-related MOVs at Grand Gulf Nuclear Station, Unit 1 (GGNS).

2.0 REGULATORY REQUIREMENTS

The NRC regulations require that MOVs important to safety be treated in a manner that provides assurance of their intended performance. Criterion 1 to Appendix A, "General Design Criteria for Nuclear Power Plants," to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR Part 50) states, in part, that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. The quality assurance program to be applied to safety-related components is described in Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50. In 10 CFR 50.55a, the NRC requires licensees to establish inservice testing (IST) programs in

accordance with Section X1 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code).

In response to concerns regarding MOV performance, NRC staff issued Generic Letter (GL) 89-10 (June 28, 1989), "Safety-Related Motor-Operated Valve Testing and Surveillance," which requested that nuclear power plant licensees and construction permit holders ensure the capability of MOVs in safety-related systems to perform their intended functions by reviewing MOV design bases, verifying MOV switch settings initially and periodically, testing MOVs under design-basis conditions where practicable, improving evaluations of MOV failures and necessary corrective action, and trending MOV problems. The staff requested that licensees complete the GL 89-10 program within approximately three refueling outages or five years from the issuance of the generic letter. Permit holders were requested to complete the GL 89-10 program before plant startup or in accordance with the above schedule, whichever was later.

The NRC staff issued seven supplements to GL 89-10 that provided additional guidance and information on MOV program scope, design-basis reviews, switch settings, testing, periodic verification, trending, and schedule extensions. GL 89-10 and its supplements provided only limited guidance regarding MOV periodic verification and the measures appropriate to assure preservation of design-basis capability. Consequently, the staff determined that additional guidance on the periodic verification of MOV design-basis capability should be prepared. On September 18, 1996, the NRC staff issued GL 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves," requesting each licensee establish a program, or ensure the effectiveness of its 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 bases of the facility. In GL 96-05, the NRC staff summarized several industry and regulatory activities and programs related to maintaining long-term capability of safety-related MOVs. For example, GL 96-05 discussed non-mandatory ASME Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor Operated Valve Assemblies in LWR [Light-Water Reactor] Power Plants, OM Code 1995 Edition; Subsection ISTC," which allows the replacement of ASME Code requirements for MOV quarterly stroke-time testing with exercising of safety-related MOVs at least once per operating cycle and periodic MOV diagnostic testing on a frequency to be determined on the basis of margin and degradation rates. In GL 96-05, the NRC staff stated that the method in OMN-1 meets the intent of the generic letter with certain limitations. The NRC staff also noted in GL 96-05 that licensees remain bound by the requirements in their code of record regarding MOV stroke-time testing, as supplemented by relief requests approved by the NRC staff.

In GL 96-05, licensees were requested to submit the following information to the NRC:

1. Within 60 days from the date of this generic letter, a written response indicating whether or not the addressee will implement the action(s)...

2. Within 180 days from the date of this generic letter, or upon notification to NRC of completion of GL 89-10 (whichever is later), ...a written summary description of its MOV periodic verification program.

The NRC staff is preparing an SE on the response of each licensee to GL 96-05. The NRC staff intends to rely to a significant extent on an industry initiative to identify valve age-related degradation which could adversely affect the design-basis capability of safety-related MOVs

(described in Section 3.0) where a licensee commits to implement that industry program. The NRC staff will conduct inspections to verify the implementation of GL 96-05 programs at nuclear power plants, as necessary.

3.0 JOINT OWNERS GROUP PROGRAM ON MOV PERIODIC VERIFICATION

In response to GL 96-05, the Boiling Water Reactor Owners Group (BWROG), Westinghouse Owners Group (WOG), and Combustion Engineering Owners Group (CEOG) jointly developed a MOV periodic verification program to obtain benefits from the sharing of information between licensees. The Joint Owners Group (JOG) Program on MOV Periodic Verification is described by BWROG in its Licensing Topical Report NEDC-32719, "BWR Owners' Group Program on Motor-Operated Valve (MOV) Periodic Verification," and described by WOG and CEOG in their separately submitted Topical Report MPR-1807, "Joint BWR, Westinghouse and Combustion Engineering Owners' Group Program on Motor-Operated Valve (MOV) Periodic Verification." The stated objectives of the JOG program on MOV Periodic Verification are (1) to provide an approach for licensees to use immediately in their GL 96-05 programs; (2) to develop a basis for addressing the potential age-related increase in required thrust or torque under dynamic conditions; and (3) to use the developed basis to confirm, or if necessary to modify, the applied approach. The specific elements of the JOG program are (1) providing an "interim" MOV periodic verification program for applicable licensees to use in response to GL 96-05; (2) conducting a dynamic testing program over the next five years to identify potential age-related increases in required thrust or torque to operate gate, globe, and butterfly valves under dynamic conditions; and (3) evaluating the information from the dynamic testing program to confirm or modify the interim program assumptions.

The JOG interim MOV periodic verification program includes (1) continuation of MOV stroke-time testing required by the ASME Code IST program; and (2) performance of MOV static diagnostic testing on a frequency based on functional capability (age-related degradation margin over and above margin for GL 89-10 evaluated parameters) and safety significance. In implementing the interim MOV static diagnostic test program, licensees will rank MOVs within the scope of the JOG program according to their safety significance. The JOG program specifies that licensees need to justify their approach for risk-ranking MOVs. In Topical Report NEDC-32264, "Application of Probabilistic Safety Assessment to Generic Letter 89-10 Implementation," BWROG described a methodology to rank MOVs in GL 89-10 programs with respect to their relative importance to core-damage frequency and other considerations to be added by an expert panel. In an SE dated February 27, 1996, the NRC staff accepted the BWROG methodology for risk-ranking MOVs in boiling water reactor nuclear plants with certain conditions and limitations. In the NRC SE (dated October 30, 1997) on the JOG Program on MOV Periodic Verification, the NRC staff indicated its view that the BWROG methodology for MOV risk ranking is appropriate for use in response to GL 96-05. With respect to Westinghouse-designed pressurized water reactor nuclear plants, WOG prepared Engineering Report V-EC-1658, "Risk Ranking Approach for Motor-Operated Valves in Response to Generic Letter 96-05." On April 14, 1998, the NRC staff issued an SE accepting with certain conditions and limitations the WOG approach for ranking MOVs based on their risk significance. Licensees not applicable to the BWROG or WOG methodologies need to justify their MOV risk-ranking approach individually.

The objectives of the JOG dynamic test program are to determine degradation trends in dynamic thrust and torque, and to use dynamic test results to adjust the test frequency and

method specified in the interim program if warranted. The JOG dynamic testing program includes (1) identification of conditions and features which could potentially lead to MOV degradation, (2) definition and assignment of valves for dynamic testing, (3) testing valves three times over a five-year interval with at least a one-year interval between valve-specific tests according to a standard test specification, (4) evaluation of results of each test, and (5) evaluation of collective test results.

In the last phase of its program, JOG will evaluate test results to validate the assumptions in the interim program to establish a long-term MOV periodic verification program to be implemented by licensees. A feedback mechanism will be established to ensure timely sharing of MOV test results among licensees and to prompt individual licensees to adjust their own MOV periodic verification program, as appropriate.

Following consideration of NRC staff comments, BWROG submitted Licensing Topical Report NEDC-32719 (Revision 2) describing the JOG program on July 30, 1997. Similarly, CEOG and WOG submitted Topical Report MPR-1807 (Revision 2) describing the JOG program on August 6 and 12, 1997, respectively. On October 30, 1997, the NRC staff issued an SE accepting the JOG program with certain conditions and limitations as an acceptable industry-wide response to GL 96-05 for valve age-related degradation.

4.0 GRAND GULF GL 96-05 PROGRAM

On November 15, 1996, the licensee submitted a 60-day response to GL 96-05 notifying the NRC that it was preparing a MOV periodic verification program at GGNS. On March 17, 1997, the licensee submitted a 180-day response to GL 96-05 providing a summary description of the MOV periodic verification program to ensure the long-term design-basis capability of the safety-related MOVs within the scope of GL 96-05 at GGNS. In a letter dated January 11, 1999, the licensee updated its commitment to GL 96-05. On April 2, 1999, the licensee provided a response to a request for additional information regarding GL 96-05 forwarded by the NRC staff on February 1, 1999. In a letter dated May 13, 1999, the licensee provided additional information superceding its letter dated April 2, 1999. In letters dated February 29 and March 30, 2000, the licensee described its MOV risk-ranking methodology and provided a summary of the MOV risk-ranking results for GGNS.

In its letter dated March 17, 1997, the licensee described its MOV periodic verification program, including scope, planned testing, capability margin, and plans to implement the JOG program at GGNS. For example, the licensee described its interim static diagnostic test program, risk-ranking approach, and dynamic diagnostic test program. The licensee stated that its GL 96-05 periodic verification program would be implemented at GGNS during its 1998 refueling outage (RFO). In its letter dated January 11, 1999, the licensee committed to participate in the JOG MOV Periodic Verification Program as a member of the BWROG and to implement the program elements described in the Topical Report NEDC-32719 (Revision 2) describing the JOG program. In a telephone conference with the NRC staff on December 14, 1999, the licensee clarified certain aspects of its GL 96-05 program.

5.0 NRC STAFF EVALUATION

The NRC staff has reviewed the information provided in the licensee's submittals describing the program to verify periodically the design-basis capability of safety-related MOVs at GGNS in

response to GL 96-05. NRC Inspection Report 50-416/96-03 (IR 96-03) provided the results of the inspection to evaluate the licensee's program to verify the design-basis capability of safety-related MOVs in response to GL 89-10. The staff closed the review of the GL 89-10 program at GGNS in IR 96-03 based on verification of the design-basis capability of safety-related MOVs at GGNS. The staff's evaluation of the licensee's response to GL 96-05 is described below.

5.1 MOV Program Scope

In GL 96-05, the NRC staff indicated that all safety-related MOVs covered by the GL 89-10 program should be considered in the development of the MOV periodic verification program. The staff noted that the program should consider safety-related MOVs that are assumed to be capable of returning to their safety position when placed in a position that prevents their safety system (or train) from performing its safety function; and the system (or train) is not declared inoperable when the MOVs are in their non-safety position.

In IR 96-03, the NRC staff reviewed the licensee's MOV program in response to GL 89-10 at GGNS and did not identify any concerns regarding the scope of the program. In its letter dated March 17, 1997, the licensee stated that its MOV periodic verification program at GGNS would ensure the long-term design-basis capability of the safety-related MOVs within the scope of GL 96-05. The NRC staff considers that the licensee has made adequate commitments regarding the scope of its MOV program.

5.2 MOV Assumptions and Methodologies

Licensees maintain the assumptions and methodologies used in the development of its MOV programs for the life of the plant (a concept commonly described as a "living program"). For example, the design basis of safety-related MOVs will need to be maintained up to date, including consideration of any plant modifications or power uprate conditions.

During the inspection documented in IR 96-03, the NRC staff reviewed the licensee's justification for the assumptions and methodologies used in the MOV program in response to GL 89-10 at GGNS. The staff determined that the licensee had adequately justified the assumptions and methodologies used in its MOV program, with certain long-term items discussed in the following section. The licensee's letter dated May 13, 1999, indicated ongoing activities, such as the addition of motor power monitor data to its MOV trending program and the implementation of modifications to increase MOV actuator output capability to increase available margin. The staff considers the licensee to have adequate processes in place to maintain the assumptions and methodologies used in its MOV program, including the design basis of its safety-related MOVs.

5.3 GL 89-10 Long-Term Items

When evaluating the GL 89-10 program at GGNS, the NRC staff discussed in IR 96-03 several items of the licensee's MOV program to be addressed over the long term. In its letter dated May 13, 1999, the licensee reported on the status of those long-term GL 89-10 aspects. For example, Inspector Followup Item 50-416/96003-01 (IFI 96003-01) identified two concerns associated with the licensee's methodology for determining the required thrust for MOVs to operate during design-basis conditions. The first concern questioned if the methodology could predict the onset of major damage that could lead to unpredictable valve behavior. During the

inspection documented in IR 96-20, the NRC staff reviewed additional information provided by the licensee and considered this concern to be resolved. In its letter dated May 13, 1999, the licensee provided a summary of the evaluation of the capability of its methodology to identify unpredictable valve behavior. The second concern noted in IR 96003-01 was that the licensee needed to provide additional justification for the valve factors assumed for certain valve groups. During the inspections documented in IR 99-02 and IR 00-01, the NRC staff considered the licensee's completed and planned actions sufficient to address this issue and closed the followup item. In its letter dated May 13, 1999, the licensee provided additional information on the valve factors assumed for specific valves addressed in IFI 96003-01. The licensee also reported that it continues to gather as-found stem friction coefficient data. The licensee stated that MOV setup procedures will be modified if future testing reveals stem lubricant degradation. The licensee also reported that it had determined that revision of the opening thrust requirement calculations to include stem rejection load would have a minimal impact on the calculated open valve factors. The licensee improved its MOV trending program by obtaining additional monitoring equipment and including several additional MOV diagnostic performance parameters in its trending database. Also, in GL 89-10, the NRC staff identified pressure locking and thermal binding as potential performance concerns for safety-related MOVs. The NRC staff has reviewed the licensee's actions in response to GL 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," and found the licensee's actions to be adequate in a letter to the licensee dated October 19, 2000.

In IR 96-03, the NRC staff reported that the licensee's program to trend MOV performance characteristics and failures was under revision, but that it was operating sufficiently for closure of the GL 89-10 review. In its letter dated May 13, 1999, the licensee discussed qualitative and quantitative aspects of its improved program for trending MOV performance at GGNS. For example, MOV parameters being trended now include torque switch trip thrust and displacement, unseating thrust, closed running thrust, stem friction coefficient, seating current, inrush current, running current, and contactor dropout time.

In IR 96-03, the NRC staff concluded that the licensee had demonstrated the design-basis capability of its safety-related MOVs at GGNS. With the licensee's ongoing MOV activities and trending program, no outstanding issues regarding the licensee's GL 89-10 program remain at GGNS.

5.4 JOG Program on MOV Periodic Verification

In its letter dated January 11, 1999, the licensee updated its commitment to implement the JOG Program on MOV Periodic Verification as described in Topical Report NEDC-32719 (Revision 2). In an SE dated October 30, 1997, the NRC staff accepted the JOG program as an industry-wide response to GL 96-05 with certain conditions and limitations. The JOG program includes (1) the JOG interim static diagnostic test program, (2) the JOG five-year dynamic test program, and (3) the JOG long-term periodic test program. The staff considers the licensee's commitments in response to GL 96-05 to include implementation of all three phases of the JOG program at GGNS. The conditions and limitations discussed in the NRC SE dated October 30, 1997, apply to the JOG program at GGNS. The staff considers the commitments by the licensee to implement all three phases of the JOG program at GGNS to be an acceptable response to GL 96-05 for valve age-related degradation.

In its letter dated March 17, 1997, the licensee noted that the interim MOV static diagnostic testing under the JOG program would be performed on a test frequency based on the risk significance and setup ratio (i.e., capability margin) of each GL 96-05 MOV. Initially, the licensee's static MOV test frequency matrix appeared to differ from the JOG interim static diagnostic test program. In its letter dated January 11, 1999, the licensee committed to implement the JOG program as described in the JOG topical report. The licensee discussed this commitment with the NRC staff in a telephone conference on December 14, 1999. According to the licensee's updated commitment, the interim MOV static diagnostic testing at GGNS will be consistent with the JOG program.

In its letter dated March 17, 1997, the licensee described the approach applied in ranking the risk significance of MOVs at GGNS. In its letters dated May 13, 1999, and February 29, and March 30, 2000, the licensee provided additional details regarding its MOV risk-ranking approach. The licensee stated that MOV risk ranking at GGNS was performed based on the November 1993 version of BWROG Topical Report NEDC-32264. The licensee determined that the differences between the November 1993 version and Revision 2 of the topical report, which is addressed in the NRC SE dated February 27, 1999, would not significantly affect the basic risk significance ranking of MOVs at GGNS. In its letter dated February 29, 2000, the licensee described its five-task approach in ranking MOVs at GGNS. In the first task, the licensee identified MOVs explicitly and implicitly modeled in the GGNS probabilistic safety analysis (PSA). In the second task, the licensee reviewed MOVs in the GL 89-10 program that were not modeled in the PSA to determine their qualitative contribution to risk. In the third task, the licensee determined the importance of the MOVs modeled in the PSA using the Fussel-Vesely measure. In the fourth task, the licensee evaluated the importance of valves implicitly modeled in the PSA, common cause events, and initiating events. In the fifth task, the licensee compiled the results of the previous tasks and initially assigned the MOVs to high, medium, or low risk categories. A licensee expert panel representing system and design engineering, operations, MOV engineering, and PSA staff, then reviewed the MOV risk rankings to compensate for any PSA modeling limitations and to determine the risk category for MOVs not included in the PSA model. In its letter dated March 30, 2000, the licensee provided a summary of the MOV risk rankings at GGNS, and justified the differences between the GGNS and BWROG MOV risk-ranking results. Based on the licensee's submittals, the staff considers the methodology used to risk rank MOVs at GGNS to be acceptable.

The JOG program is intended to address most gate, globe and butterfly valves used in safety-related applications in the nuclear power plants of participating licensees. JOG indicates that each licensee is responsible for addressing any MOVs outside the scope of applicability of the JOG program. The NRC staff recognizes that JOG has selected a broad range of MOVs and conditions for the dynamic testing program. The NRC staff expects significant information to be obtained on the performance and potential degradation of safety-related MOVs during the interim static diagnostic test program and the JOG dynamic test program. As the test results are evaluated, JOG might include or exclude additional MOVs with respect to the scope of its program. Although the test information from the MOVs in the JOG dynamic test program might not be adequate to establish a long-term periodic verification program for each MOV outside the scope of the JOG program, sufficient information should be obtained from the JOG dynamic test program to identify any immediate safety concern for potential valve age-related degradation during the interim period of the JOG program. Therefore, the NRC staff considers it acceptable for the licensee to apply its interim static diagnostic test program to GL 96-05

MOVs that currently might be outside the scope of the JOG program with the feedback of information from the JOG dynamic test program to those MOVs. In the NRC SE dated October 30, 1997, the NRC staff stated that licensees implementing the JOG program must determine any MOVs outside the scope of the JOG program (including service conditions) and justify a separate program for periodic verification of the design-basis capability of those MOVs.

5.5 Motor Actuator Output

The JOG program focuses on the potential age-related increase in the thrust or torque required to operate valves under their design-basis conditions. In the NRC SE dated October 30, 1997, on the JOG program, the NRC staff specified that licensees are responsible for addressing the thrust or torque delivered by the MOV motor actuator and its potential degradation. Although JOG does not plan to evaluate degradation of motor actuator output, significant information on the output of motor actuators will be obtained through the interim MOV static diagnostic test program and the JOG dynamic test program. Several parameters can be obtained during MOV static and dynamic testing to help identify motor actuator output degradation when opening and closing the valve including, as applicable, capability margin, thrust and torque at control switch trip, stem friction coefficient, load sensitive behavior, and motor current.

In its letter dated March 17, 1997, the licensee indicated that it uses a combination of periodic static testing, dynamic testing, and data trending to identify actuator output degradations to assure adequate actuator capability for safety-related MOVs at GGNS to perform their design-basis functions. For example, in its letter dated May 13, 1999, the licensee reported that stem friction coefficients are monitored and trended to identify degradation. As noted earlier in this SE, the licensee also trends torque switch trip thrust and displacement, unseating thrust, closed running thrust, seating current, inrush current, running current, and contactor dropout time. In the future, the licensee also plans to trend MOV tests conducted with a motor power monitor.

In Technical Update 98-01 and its Supplement 1, Limitorque Corporation provided updated guidance for predicting the torque output of its alternating current (ac)-powered motor actuators. In its letter dated May 13, 1999, the licensee stated that it had addressed Limitorque Technical Update 98-01 at GGNS to determine any potential MOV operability and margin concerns. The licensee noted that modifications had been implemented as a result of the MOV evaluations. In IR 00-01, the NRC staff reported that the licensee planned to complete additional margin improvement modifications in 2001.

In its letter dated July 17, 1998, forwarding Technical Update 98-01, Limitorque indicates that a future technical update will be issued to address the application of direct current (dc)-powered MOVs. In its letter dated May 13, 1999, the licensee stated that dc-powered MOV motor torque at GGNS is calculated in accordance with the guidance contained in Limitorque Technical Update 92-02. The licensee reported that it is a member of the BWROG effort to update the guidance for determining dc-powered MOV output. The licensee also stated that it had implemented a modification to increase the actuator capability of dc-powered MOV 1E51F045 in the reactor core isolation cooling system at GGNS.

Any MOV operability concerns that might be identified in the future will be processed in accordance with established regulatory requirements and plant-specific commitments.

The NRC staff considers the licensee to be establishing sufficient means to monitor MOV motor actuator output and its potential degradation.

6.0 CONCLUSION

The staff finds that the licensee has established an acceptable program to verify periodically the design-basis capability of the safety-related MOVs at GGNS through its commitment to all three phases of the JOG Program on MOV Periodic Verification and the additional actions described in its submittals. Therefore, the staff concludes that the licensee has adequately addressed the actions requested in GL 96-05. The staff may conduct inspections to verify that the implementation of the MOV periodic verification program is in accordance with the licensee's commitments in its submittals, this NRC SE, and the NRC's SE dated October 30, 1997, on the JOG Program on MOV Periodic Verification.

Principle Contributor: T. Scarbrough

Date: December 11, 2000

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