June 12, 2000

Mr. Craig G. Anderson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 S. R. 333
Russellville, AR 72801

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - RE: CLOSEOUT OF GENERIC LETTER 96-05 (TAC NOS. M97013 AND M97014)

Dear Mr. Anderson:

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 Power-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 an MOV periodic verification program at Arkansas Nuclear One (ANO), Units 1 and 2. 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 ANO, and in a letter dated January 11, 1999, EOI updated its commitment to GL 96-05. On May 28, 1999, EOI provided a response to a request for additional information regarding GL 96-05, forwarded by the NRC staff on April 2, 1999.

After review of the submittals and applicable NRC inspection reports for the MOV program at ANO, we find that EOI has established an acceptable program to verify periodically the design-basis capability of the safety-related MOVs at ANO 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 ANO to verify implementation of the MOV periodic verification program 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 NRC's efforts on TAC Nos. M97013 ans M97014.

Sincerely,

***/RA/***

M. Christopher Nolan, Project Manager, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-313 and 50-368

Enclosure: Safety Evaluation

cc w/encl: See next page

This completes NRC's efforts on TAC Nos. M97013 ans M97014.

Sincerely,

***/RA/***

M. Christopher Nolan, Project Manager, Section 1
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Arkansas Nuclear One

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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,"

ARKANSAS NUCLEAR ONE, UNITS 1 AND 2

DOCKET NUMBERS 50-313 AND 50-368

## 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 Arkansas Nuclear One (ANO), Units 1 and 2.

## 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 XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel 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 Power-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 rate. 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 (BWR) Owners Group (BWROG), Westinghouse Owners Group (WOG), and Combustion Engineering Owners Group (CEOG) jointly developed an 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 the 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 the 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 ANO GL 96-05 PROGRAM

On November 15, 1996, Entergy Operations, Inc., submitted a 60-day response to GL 96-05 notifying the NRC that it was preparing an MOV periodic verification program at ANO, Units 1 and 2. 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 ANO. In a letter dated January 11, 1999, the licensee updated its commitment to GL 96-05. On May 28, 1999, the licensee provided a response to a request for additional information regarding GL 96-05 forwarded by the NRC staff on April 2, 1999.

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 ANO. 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 begin implementation at ANO within 120 days after the completion of the 1997 refueling outage. In its letter dated January 11, 1999, the licensee committed to participate in the JOG MOV Periodic Verification Program as a member of the Babcock & Wilcox Owners Group (ANO, Unit 1) and CEOG (ANO, Unit 2), 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 ANO in response to GL 96-05. NRC Inspection Report 50-313, 368/96-23 (IR 96-23) provided the results of inspections 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 licensee's GL 89-10 program in IR 96-23 based on verification of the design-basis capability of safety-related MOVs at ANO. 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 nonsafety position.

In IR 96-23, the NRC staff reviewed the licensee's MOV program in response to GL 89-10 at ANO 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 ANO 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.

In IR 96-23, 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 ANO. The staff determined that the licensee had adequately justified the assumptions and methodologies used in its MOV program with certain long-term aspects discussed in the following section. The licensee's letter dated May 28, 1999, indicated ongoing activities, such as review of motor actuator output, to update its MOV program assumptions and methodologies. 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 ANO, the NRC staff discussed in IR 96-23 several items of the licensee's MOV program to be addressed over the long term. In its letter dated May 28, 1999, the licensee reported on the status of those long-term GL 89-10 aspects. For example, the licensee evaluated static and dynamic test unwedging data for a large number of gate valves and did not observe a general tendency for unseating loads to increase with differential pressure. The licensee stated that it (1) has modified a number of the safety-related MOVs having reduced or nonconservative margins, (2) is considering modification or design-basis reviews to improve margins for the remaining low margin MOVs, and (3) tests low margin MOVs more frequently than MOVs with high margins. The licensee took actions to enhance its MOV trending program and maintenance procedures. 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 is reviewing licensee's actions in response to GL 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," and will issue an SE at the completion of the review.

In IR 96-23, the NRC staff discussed its review of the MOV trending program at ANO. The staff found that the licensee was trending thrust and torque at control switch trip, total thrust and torque, stem factor, and torque switch settings. However, the staff noted that the licensee was not trending several other useful parameters. In its letter dated May 28, 1999, the licensee stated that it had improved its MOV trending program based on benchmarking efforts at other sites. For example, the licensee enters all MOV test data into a computerized database with the capability to provide MOV trend results. Standard trending packages include all relevant MOV data. In addition to quantitative parameters, the licensee enters qualitative information (such as test anomalies) into the database to allow proper trending of MOV performance issues. The licensee indicated that additional improvements may be incorporated as this area evolves.

With the licensee's ongoing MOV activities and trending program, no outstanding issues regarding the licensee's GL 89-10 program remain at ANO.

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 ANO. The conditions and limitations discussed in the NRC SE dated October 30, 1997, apply to the JOG program at ANO. The staff considers the commitments by the licensee to implement all three phases of the JOG program at ANO 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 ANO will be consistent with the JOG program.

In its letter dated May 28, 1999, the licensee described its five-step approach in ranking MOVs at ANO. In Step 1, the licensee identifies the applicable MOVs within the scope of the program and their functional failure modes. In Step 2, the licensee (a) determined the safety importance of the MOV failures in the ANO Probabilistic Safety Assessment (PSA) model using the core damage frequency cutset results, (b) identified MOV functional failure modes and grouped MOV failure events in the PSA model according to function, (c) artificially increased the number of cutsets containing MOV active failures by selecting a failure rate (such as 0.1 per demand) higher than typically assumed, and re-quantifying the PSA model, (d) performed a safety importance evaluation on the MOV functional failure modes appearing in the cutset results, and (e) performed an additional review to qualitatively incorporate Level-1 risk issues associated with intersystem loss of coolant accidents, anticipated transients without scram events, and internal flooding analyses, and Level-2 results of the ANO, Units 1 and 2 Integrated Plant Evaluations (IPEs). In Step 3, an expert panel

composed of ANO staff from Operations, Maintenance, System Engineering, MOV Testing and Design Engineering, and Nuclear Engineering Design, established the overall safety importance ranking for each MOV by assuring that the risk ranking accounted for the functional failure modes and that significant safety and operational concerns were addressed. In Step 4, the licensee establishes the setup margins for each MOV based on as-left test results and minimum operating requirements. In Step 5, the licensee develops the test schedule based on the safety importance ranking and setup margin for each MOV in the program. The licensee identified the MOVs at ANO that are categorized as having high risk importance in its letter dated May 28, 1999. Based on the licensee's submittals, the staff considers the licensee's methodology for risk-ranking MOVs at ANO 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 and that significant information will 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, the 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's 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. The conditions and limitations discussed in the NRC's SE dated October 30, 1997, apply to the JOG program at ANO.

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's 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 May 28, 1999, 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 output capability for safety-related MOVs at ANO to perform their design-basis functions. For example, as discussed in IR 96-23, the licensee monitors stem friction coefficient,

compares data from diagnostic tests with existing assumptions, and makes adjustments as necessary.

In Technical Update 98-01 and its Supplement 1, Limitorque Corporation (LImitorque) provided updated guidance for predicting the torque output of its alternating current (ac)-powered motor actuators. In its letter dated May 28, 1999, the licensee discussed its review of this information with respect to the capability of the ac-powered MOVs in the ANO program. Based on its review, the licensee determined that the as-left torque switch settings for 47 MOVs were outside of the newly defined motor pullout torque guidelines. The licensee established the operability for those MOVs based on valve safety function, actual available voltage at the motor terminals, and actuator capability to close the valve for a one-time stroke. Also in response to the new information from Limitorque, the licensee planned to further review MOV voltage and pressure design requirements, adjust torque switch settings, or modify MOVs as corrective action. The licensee also applied the new Limitorque guidance to its quarter-turn MOV population at ANO, and found the quarter-turn MOVs to be operable but planned to reset the torque switches for several MOVs. Any MOV operability concerns that might be identified in the future will be processed in accordance with established regulatory and plant-specific requirements.

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 28, 1999, the licensee stated that it had initiated a review of dc-powered MOVs at ANO. This review includes an assessment of the electrical supply system, battery sizing criteria, and dc-powered actuator capability. The licensee reported that all potentially impacted dc-powered MOVs at ANO are operable based on the current understanding of the issue.

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 ANO 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.

Principal Contributor: T. Scarbrough

Date: June 12, 2000