

February 15, 2001

Mr. Ronald DeGregorio
Vice President Oyster Creek
AmerGen Energy Company, LLC
P.O. Box 388
Forked River, NJ 08731

SUBJECT: SAFETY EVALUATION OF LICENSEE RESPONSE TO GENERIC
LETTER 96-05, OYSTER CREEK NUCLEAR GENERATING STATION
(TAC NO. M97078)

Dear Mr. DeGregorio:

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 (MOV) continue to be capable of performing their safety functions within the current licensing bases of the facility.

On November 16, 1996, GPU Nuclear, Inc., submitted a 60-day response to GL 96-05 notifying the NRC that it would implement an MOV periodic verification program at Oyster Creek Nuclear Generating Station (Oyster Creek). 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 planned to be implemented at Oyster Creek. In a letter dated April 23, 1998, the licensee updated its commitment to GL 96-05. On May 12, 2000, the licensee provided a response to an NRC staff request for additional information regarding GL 96-05.

The staff has reviewed the licensee's submittals and applicable NRC inspection reports for the MOV program at Oyster Creek. The staff finds that the licensee has established an acceptable program to verify periodically the design-basis capability of the safety-related MOVs at Oyster Creek 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 enclosed safety evaluation (SE), the staff concluded that the licensee is adequately addressing the actions requested in GL 96-05. The staff may conduct inspections at Oyster Creek to verify the implementation of the MOV periodic verification program is in accordance with the licensee's commitments described in this NRC SE; the NRC SE dated October 30, 1997, on the JOG Program on MOV Periodic Verification; and the NRC SE dated February 27, 1996, on the Boiling Water Reactors Owners Group methodology for ranking MOVs by their safety significance.

R. DeGregorio

- 2 -

On correspondence dated earlier than August 8, 2000, GPU Nuclear, Inc. (GPUN) was the licensed operator for Oyster Creek. On August 8, 2000, GPUN's ownership interest in Oyster Creek was transferred to AmerGen Energy Company, LLC (AmerGen). By letter dated August 10, 2000, AmerGen requested that the U.S. Nuclear Regulatory Commission continue to review and act upon all requests before the Commission which had been submitted by GPUN.

Sincerely,

/RA/

Helen N. Pastis, Sr. Project Manager, Section I
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: Safety Evaluation

cc w/encl: See next page

On correspondence dated earlier than August 8, 2000, GPU Nuclear, Inc. (GPUN) was the licensed operator for Oyster Creek. On August 8, 2000, GPUN's ownership interest in Oyster Creek was transferred to AmerGen Energy Company, LLC (AmerGen). By letter dated August 10, 2000, AmerGen requested that the U.S. Nuclear Regulatory Commission continue to review and act upon all requests before the Commission which had been submitted by GPUN.

Sincerely,

/RA/

Helen N. Pastis, Sr. Project Manager, Section I
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

PUBLIC

PDI-1 Reading File

M. Gamberoni

S. Little

H. Pastis

OGC

ACRS

B. Platchek, RGI

T. Scarbrough

Accession Number: ML010360351

*SE Dated 6/30/00, no major changes

OFFICE	PDI-1\PM	PDI-1\LA	DE/EMEB*	PDI-1\SC
NAME	HPastis	SLittle	DTerao	PTam for MGamberoni
DATE	2/13/01	2/13/01	6/30/00	2/15/01

OFFICIAL RECORD COPY

AmerGen Energy Company, LLC
Oyster Creek Nuclear Generating Station

cc:

Kevin P. Gallen, Esquire
Morgan, Lewis & Bockius LLP
1800 M Street, NW
Washington, DC 20036-5869

Manager Nuclear Safety & Licensing
Oyster Creek Nuclear Generating Station
Mail Stop OCAB2
P. O. Box 388
Forked River, NJ 08731

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406-1415

Mayor
Lacey Township
818 West Lacey Road
Forked River, NJ 08731

Resident Inspector
c/o U.S. Nuclear Regulatory Commission
P.O. Box 445
Forked River, NJ 08731

Kent Tosch, Chief
New Jersey Department of
Environmental Protection
Bureau of Nuclear Engineering
CN 415
Trenton, NJ 08625

PECO Energy Company
Nuclear Group Headquarters
Correspondence Control
P.O. Box 160
Kennett Square, PA 19348

Mr. Jeffrey A. Benjamin
Licensing - Vice President
Exelon Corporation
1400 Opus Place, Suite 900
Downers Grove, IL 60521

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,"
OYSTER CREEK NUCLEAR GENERATING STATION
DOCKET NUMBER 50-219

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 GPU Nuclear, Inc., (licensee) to verify periodically the design-basis capability of safety-related MOVs at Oyster Creek Nuclear Generating Station (Oyster Creek).

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 Section 50.55a of 10 CFR Part 50, the NRC requires licensees to establish inservice testing (IST) programs in accordance with the American Society of Mechanical

Engineers (ASME) Boiler and Pressure Vessel Code, and more recently the ASME Code for Operation and Maintenance of Nuclear Power Plants.

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 5 years from the issuance of the GL. 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 ensure 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 American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Code Case OMN-1, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor Operated Valve Assemblies in LWR 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 GL 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:

- a. within 60 days from the date of GL 96-05, a written response indicating whether or not the licensee would implement the requested actions; and
- b. within 180 days from the date of GL 96-05, or upon notification to the NRC of completion of GL 89-10 (whichever is later), a written summary description of the licensee's 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 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 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 5 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 BWR nuclear power 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 5-year interval with at least a 1-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. On October 19, 1999, the Babcock & Wilcox Owners Group (B&WOG) forwarded Topical Report MPR-1807 (Revision 2) to the NRC, and stated that B&WOG is now participating in the JOG Program on MOV Periodic Verification. In a letter dated May 15, 2000, the NRC staff informed B&WOG that Topical Report MPR-1807 is acceptable for referencing in B&WOG licensing applications to the extent specified and under the limitations delineated in the report and the associated NRC SE dated October 30, 1997.

4.0 OYSTER CREEK GL 96-05 PROGRAM

On November 16, 1996, GPU Nuclear, Inc., submitted a 60-day response to GL 96-05 notifying the NRC that it would implement an MOV periodic verification program at Oyster Creek. 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 planned to be implemented at Oyster Creek. In a letter dated April 23, 1998, the licensee updated its commitment to GL 96-05. On May 12, 2000, the licensee provided a response to an NRC staff request for additional information.

In its letter dated March 17, 1997, the licensee described its MOV periodic verification program, including risk-ranking approach, scope, planned testing, capability margin, and plans to implement the JOG Program on MOV Periodic Verification at Oyster Creek. For example, the licensee indicated that its interim MOV static diagnostic test program and margin calculations would be performed in accordance with the JOG program as described in BWROG Topical Report NEDC-32719. The licensee also indicated that the ranking of MOVs at Oyster Creek based on their safety significance would be performed in accordance with BWROG Topical

Report NEDC-32264. The licensee stated that the JOG interim static test program and dynamic test program would begin implementation at Oyster Creek in 1998. In its letter dated April 23, 1998, the licensee updated its commitment to participate in the JOG program as a member of BWROG and to implement the program elements described in Topical Report NEDC-32719 (Revision 2).

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 Oyster Creek in response to GL 96-05. NRC Inspection Reports (IRs) 50-219/91-81, 97-05, 98-07, and 98-12 provide 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 98-12 based on verification of the design-basis capability of safety-related MOVs at Oyster Creek. 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.

As part of the inspections documented in IRs 97-05, 98-07, and 98-12, the NRC staff reviewed the scope of the licensee's MOV program in response to GL 89-10 at Oyster Creek. In IR 98-12, the staff reviewed the licensee's justification for the removal of core spray valves V-20-12 and V-20-18 from the scope of the GL 89-10 program. These core spray valves are normally in their safety position (open), and the core spray system is considered inoperable when the valves are closed. In completing the review of GL 89-10 at Oyster Creek in IR 98-12, the NRC staff did not identify any concerns regarding the scope of the licensee's GL 89-10 program. In its letter dated March 17, 1997, the licensee indicated that all of the MOVs in its GL 89-10 program would be included in its MOV periodic verification program in response to 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 their 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 98-12, 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 Oyster Creek. The staff determined that the licensee had adequately justified the

assumptions and methodologies used in its MOV program. 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 Oyster Creek, the NRC staff discussed in IR 98-12 an item of the licensee's MOV program to be addressed over the long term. During the inspection documented in IR 98-12, the staff reviewed the licensee's plans to increase the design capability of Isolation Condenser valve V-14-30. The licensee plans to modify MOV V-14-30 by replacement of the motor power cable during the fall 2000 refueling outage. During the inspection, the NRC staff reviewed the thrust calculation for MOV V-14-30, and agreed that there is adequate confidence that the MOV will be capable of performing its design function until the modification can be completed. Also, in GL 89-10, the NRC staff identified pressure locking and thermal binding as potential performance concerns for safety-related MOVs. The staff completed its review of the licensee's actions in response to GL 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," in an SE dated December 2, 1999.

In IR 91-81, the NRC staff reported on its review of the licensee's program to trend MOV performance characteristics and failures. For example, the licensee trends MOV diagnostic test results and set up a database of nameplate information to allow a search of similar MOVs to identify generic issues. The licensee also had established a process to trend MOV failures. The staff noted in IR 91-81 that the licensee planned to provide improved administrative controls to document the MOV diagnostic trending process and to incorporate the trending of MOV deficiencies into its program. In its letter dated May 12, 2000, the licensee stated that it will continue to perform appropriate periodic static diagnostic testing and trending to confirm MOV capability, proper switch settings, and MOV conditions.

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

5.4 JOG Program on MOV Periodic Verification

In its letter dated April 23, 1998, the licensee updated its commitment to implement the JOG Program on MOV Periodic Verification as described in Topical Report NEDC-32719 (Revision 2) and did not identify any deviations from the JOG program at Oyster Creek. 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 5-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 Oyster Creek. The conditions and limitations discussed in the NRC SE dated October 30, 1997, apply to the JOG program at Oyster Creek. The staff considers the commitments by the licensee to implement all three phases of the JOG program at Oyster Creek 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 at Oyster Creek would be performed on a test frequency based on the safety significance and capability margin of each GL 96-05 MOV in accordance with Topical Report NEDC-32719 describing the JOG program. The licensee stated that the ranking of GL 96-05 MOVs at Oyster Creek by their safety significance would be performed in accordance with the MOV risk-ranking approach and results presented in BWROG Topical Report NEDC-32264. In an SE dated February 27, 1996, the NRC staff accepted the BWROG methodology for risk ranking MOVs in BWR nuclear power plants with certain conditions and limitations. In the NRC SE (dated October 30, 1997) on the JOG Program on MOV Periodic Verification, the staff indicated its view that the BWROG methodology for MOV risk ranking is appropriate for use in response to GL 96-05. The staff notes that BWROG also provided an example list of risk-significant MOVs for consideration by each licensee in applying the owners group methodology. Based on the licensee's summary, the staff considers the methodology for risk ranking MOVs at Oyster Creek 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 specifies 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 12, 2000, the licensee indicated that it uses a combination of periodic static testing, preventive maintenance, actuator refurbishment, and data trending to identify actuator output degradations and to assure adequate actuator output capability for safety-related MOVs at Oyster Creek to perform their design-basis functions. In particular, the licensee stated that it would continue to perform periodic static diagnostic testing and trending to confirm MOV capability, proper MOV switch settings, and MOV condition. The licensee also will continue to perform preventive maintenance activities, such as stem lubrication, and actuator and limit switch gearcase inspections. The licensee stated that actuator refurbishments would be performed, as needed, based on the results of its preventive maintenance activities to provide reasonable confidence of proper actuator performance. In addition, the licensee uses test results obtained from the motor control center to help monitor potential MOV degradation.

In Technical Update 98-01 and its Supplement 1, Limitorque Corporation provided updated guidance for predicting the torque output of its ac-powered motor actuators. In its letter dated May 12, 2000, the licensee reported that it had revised the MOV design-basis calculations at Oyster Creek to incorporate this new guidance. The licensee applied a methodology developed by the Commonwealth Edison Company (ComEd) to predict ac-power motor actuator output for MOVs at Oyster Creek with motors considered exceptions to the Limitorque update and where needed to demonstrate additional torque margin. The licensee will be responsible for addressing any changes to the ComEd methodology resulting from the Limitorque update.

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 dc-powered MOVs. In its letter dated May 12, 2000, the licensee stated that the Oyster Creek GL 89-10 and 96-05 program scope includes 6 dc-powered MOVs. The licensee indicated that it performs stroke-time calculations for its dc-powered MOVs that include motor speed dependencies on voltage, load, and temperature. The licensee is actively participating in the BWROG effort to develop an improved methodology for the application of dc-powered MOVs.

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 Oyster Creek 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 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 SE dated October 30, 1997, on the JOG Program on MOV Periodic Verification; and the NRC SE dated February 27, 1996, on the BWROG methodology for ranking MOVs by their safety significance.

Principal Contributor: T. Scarbrough

Date: February 15, 2001