



**Consumers
Power**

**POWERING
MICHIGAN'S PROGRESS**

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

Kurt M. Haas
Plant Safety and Licensing Director

December 5, 1994

Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - REPLY TO NOTICE OF VIOLATION - INSPECTION REPORT 94015 - FAILURE TO TAKE PROMPT AND ADEQUATE CORRECTIVE ACTIONS PERTAINING TO MOTOR OPERATED VALVES.

NRC Inspection Report No. 94015, dated November 4, 1994, documented the results of a routine safety inspection conducted from September 12 through 30, 1994. The areas examined during the inspection consisted primarily of a review of the Palisades Motor Operated Valve (MOV) Program established in response to Generic Letter 89-10. The inspection report identified an apparent violation involving four examples of failure to implement prompt and adequate corrective actions. Our reply to the Notice of Violation is provided as Attachment 1 to this letter.

The inspection report also requested that Palisades document our plans for MOV design basis testing in the 1995 Refueling Outage. The testing plan is provided as Attachment 2 to this letter.

SUMMARY OF COMMITMENTS

This letter contains three new commitments summarized below:

1. Complete all planned MOV dynamic testing during the 1995 Refueling Outage.
2. Verify the design basis capability of all Generic Letter 89-10 program MOVs within one month of start-up from the 1995 Refueling Outage. This verification includes the validation of programmatic assumptions from the results of MOVs tested in the Refout, and those MOVs set up using the best available industry data.

120055
9412120113 941205
PDR ADDCK 05000255
Q PDR

A CMS ENERGY COMPANY

A064

3. Revise Engineering Manual Procedure EM-28-01, "Motor Operated Valve Program," to clarify the evaluation of completed test data to include all penalties and uncertainties, and to implement all MOV Program enhancements identified during the inspection.



Kurt M. Haas
Plant Safety and Licensing Director

CC Administrator, Region III, USNRC
NRC Resident Inspector - Palisades

Attachment

CONSUMERS POWER COMPANY

To the best of my knowledge, information and belief, the contents of this submittal are truthful and complete.

By *Kenneth P. Powers*
Kenneth P. Powers, Plant Engineering
and Modifications Manager

By *Robert A. Fenech*
Robert A. Fenech, Vice President
Nuclear Operations

Sworn and subscribed to before me this 5th day of December 1994.

Marla A. Fall

Marla A. Fall, Notary Public
Jackson County, Michigan
My commission expires 7-20-99

[SEAL]

ATTACHMENT 1

Consumers Power Company
Palisades Plant
Docket 50-255

REPLY TO NOTICE OF VIOLATION
NRC INSPECTION REPORT 94015

December 5, 1994

REPLY TO NOTICE OF VIOLATION

VIOLATION

10 CFR 50, Appendix B, Criterion XVI, requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.

- a. *Contrary to the above, from May 1993 to September 1994, no evaluation was performed to determine the impact on MOV operability resulting from the Limitorque 10 CFR Part 21 notice on degraded actuator motor torque at high temperatures (50-255/94015-01a(DRS)).*
- b. *Contrary to the above, an evaluation of uncertainties revealed during dynamic testing of the HPSI hot leg injection valves, MO-3082 and MO-3083 conducted in January 1991 was not adequately performed until August of 1994 (50-255/94015-01b(DRS)).*
- c. *Contrary to the above, as of September 13, 1994, corrective action was not taken to address the actuator overthrust condition of MOVs MO-0743, MO-0760, MO-1043A, and MO-3072. These actuators were left in an overthrust condition after diagnostic testing was performed in 1993 (50-255/94015-01c(DRS)).*
- d. *Contrary to the above, as of September 28, 1994, corrective action was not taken after the AFW SG FOGG valve, MO-759, was overtorqued above the allowable ratings, rendering the valve inoperable (50-255/94-015-01d(DRS)).*

CPCO RESPONSE

Consumers Power Company agrees that we failed to take prompt and adequate corrective actions for the four conditions stated above.

REASON FOR THE VIOLATION

The reason for the violation was a combination of weak management oversight and inadequate program controls for the Palisades Generic Letter 89-10 Motor Operated Valve (MOV) Implementation Program. Plant management failed to prioritize the available resources to complete the necessary work scope in a timely manner. Also, the program controls did not require prompt full analysis of completed MOV test data. Full analysis would have promptly validated MOV actuator set-up criteria, and also promptly identified any actuator overthrust or overtorque concerns. The specific details are as follows:

UNTIMELY COMPLETION OF LIMITORQUE 10 CFR PART 21 NOTICE - (ITEM A)

The root cause for the untimely completion of the 10 CFR Part 21 Notice was a failure to properly prioritize the available resources. Thus, the evaluation of the Limitorque 10 CFR Part 21 Notice on degraded actuator motor torque at high temperatures was not completed in a timely manner. The evaluation of the Part 21 notice was originally planned to be completed in conjunction with a revision of degraded voltage calculations, which also needed to incorporate similar high ambient temperature effects. The combination of the two analyses would provide an efficient and complete evaluation of the impact of increased ambient temperatures on the operability of MOVs. The completion of the degraded voltage calculations was delayed, and the impact upon the ultimate completion of the 10 CFR Part 21 evaluation was not fully scrutinized and communicated. At Palisades, 10 CFR Part 21 evaluations and their due dates are controlled by Administrative Procedure 3.16, "Industry Experience Review Program." In this case the procedural requirements were properly implemented to obtain a due date extension from the appropriate line management. The process for due date extensions will be reviewed to ensure that adequate justification and management oversight is provided.

A second MOV engineer was hired in June 1994, and the 10CFR Part 21 evaluation was completed in September 1994. The revised degraded voltage calculations were subsequently completed in November, 1994, and are presently being incorporated in the new revision of the MOV torque/thrust calculations. As mentioned in the inspection report, a MOV Program Recovery Plan has been developed. The plan identifies the remaining open actions for implementation of GL 89-10, and will receive proper management attention to ensure timely completion.

INADEQUATE OPERABILITY ACCEPTANCE CRITERIA FOR MOTOR OPERATED VALVE TESTS

The root cause for the remaining three examples, Items B, C and D in the violation statement, was a failure to develop proper operability acceptance criteria for MOV test procedures. The existence of proper acceptance criteria in the MOV test procedures would ensure that all necessary analysis is performed prior to declaring the MOV operable. The specific details for the three examples are as follows:

Inadequate evaluation of completed tests for MO-3082 and MO-3083,(Item B).

The acceptance criteria used in the 1991 dynamic test procedures for the High Pressure Safety Injection, Hot Leg Injection MOVs, MO-3082 and MO-3083, was not adequate. The acceptance criteria did not require any analysis of the actual completed test data to validate the inputs and assumptions used during the initial set-up of the actuators. The factors that required validation include; the test conditions compared to design basis conditions, valve factor, rate of loading, extrapolated DP thrust, torque switch trip margin, DP tested thrust compared to the required thrust window, and as-left thrust acceptability. The failure to require the prompt review of the test data resulted in an untimely evaluation.

In-situ dynamic testing was completed on MO-3082 and MO-3083 in January, 1991. The MOVs performance met the acceptance criteria of the dynamic test procedures, which essentially only required the valves to stroke properly against the developed differential pressure. The test conditions provided a mean effective differential pressure (MEDP) equal to 99% of the worst case design basis differential pressure. Based upon the successful performance of the MOVs at the design basis differential pressure, the MOVs were declared operable. The current project engineer was aware that the completed test results would eventually require a formal analysis. However, it was apparent that the analysis would not result in any significant findings since the MOVs were tested at essentially full MEDP. Recent review of the completed test data confirmed that no operability concerns existed for the two MOVs.

The importance of a timely close-out validation became apparent to the MOV project team. Future dynamic test procedures will contain specific acceptance criteria which will require the completion of test data analysis prior to declaring the MOV operable. This process will ensure that prompt engineering reviews occur on completed tests, and that proper data validation occurs prior to declaring equipment operable.

Inadequate Overthrust Evaluation of Four MOVs, (Item C).

The acceptance criteria in the MOV static test procedures from the 1993 refueling outage was not adequate. The required analysis of the recorded maximum thrust value did not contain all appropriate analytical penalties, that need to be conservatively applied to the recorded thrust data. A VOTES diagnostic error penalty was added to the maximum close thrust to evaluate the valve and operator structural capabilities. However, two additional penalties that needed to be applied were extrapolation and torque switch repeatability errors. The program recognized in August, 1994, the need to upgrade MSE-E-21 to include all relevant penalties during the evaluation of a potential MOV overthrust or overtorque condition. The analysis was reformed and it was determined that four MOVs, MO-0743, MO-0760, MO-1043A, and MO-3072, tested in the 1993 Refueling Outage were in a potential overthrust condition. The potential overthrust condition was evaluated under Condition Report C-PAL-94-0755, and the valves were determined to be operable. Procedure MSE-E-21 was reviewed and revised on 9/12/94 to identify the proper analytical penalties that need to be applied to MOV completed test data.

Inadequate Overtorque Evaluation of MO-0759, (Item D)

The MOV testing procedure MSE-E-21, "Votes Diagnostic System Operating Procedure," did not provide adequate guidance to indicate the need to evaluate the impact of an operator overtorque event. The relationship between operator thrust ratings and operator torque ratings was not clear. During the 1993 Refueling Outage, MO-0759 achieved locked rotor on two occasions. The operator and valve were subsequently inspected for potential degradation. The inspection criteria, for specific components of both the valve and operator, were developed to identify any degradation created by high thrust loads. The need to inspect several other components for degradation due to the high torque loads was not recognized. The MOV was only inspected for potential

damage due to high thrust and no problems were found. Condition Report C-PAL-94-0794 was initiated to evaluate the failure to complete an inspection for potential damage from high torque. Based on vendor input of the overtorque condition, operation of the valve will not be allowed until a complete inspection can be performed. A complete inspection is planned for MO-0759 in the 1995 Refueling Outage. The MOV, MO-0759, Auxiliary Feedwater Isolation Valve, is normally open and is currently caution tagged. Isolation for the associated Auxiliary Feedwater line is available from the preferred air operated flow control valve, CV-0737A, or the redundant MOV, MO-0754.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED:

The following corrective actions have been taken as a result of the event:

1. A "MOV Program Recovery Plan" has been developed to establish the directives of the MOV Program to complete implementation of GL 89-10 in the 1995 Refueling Outage, and provide proper MOV setup for the remaining life of the station. Plant management is providing proper resources and funding to accomplish complete implementation of GL 89-10 in the 1995 Refueling Outage in accordance with this plan.
2. All previous VOTES and MOVATS dynamic tests, that contain sufficient test data for validation, have been analyzed for potential impact to the inputs and assumptions used in the applicable Thrust/Torque calculations. No change is required to the setup of the MOVs based on the results of this completed evaluation.
3. All "As-Left" test results of previous VOTES tests have been evaluated for potential overthrust or overtorque issues. No additional problems were noted.
4. The acceptance criteria of Permanent Maintenance Procedure MSE-E-21 Rev. 9, "VOTES Diagnostic System Operating Procedure" was revised to evaluate the results of diagnostic testing for potential overthrust and overtorque of both the valve and operator. The uncertainties for VOTES diagnostic, extrapolation, and Torque Switch Repeatability errors are included in this evaluation. The procedure was also revised to require this evaluation prior to declaring the MOV operable after both static and dynamic testing.

CORRECTIVE ACTIONS TO BE TAKEN TO AVOID FURTHER NONCOMPLIANCE:

Corrective actions to be taken to avoid further noncompliance are:

1. Revise Engineering Manual Procedure EM-28-01, "Motor Operated Valve Program," to clarify the evaluation of completed test data to include all penalties and uncertainties, and to implement all MOV Program enhancements identified during the inspection.
2. Review the present methods for due date extensions pertaining to Industry experience documents, including 10 CFR Part 21 Reportability evaluations, to ensure adequate management oversight occurs. Make changes to Administrative Procedure 3.16 if required.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance with 10 CFR 50, Appendix B, Criterion XVI has been achieved for the items in this inspection report.

ATTACHMENT 2

Consumers Power Company
Palisades Plant
Docket 50-255

PALISADES MOTOR OPERATED VALVES TESTING
PLAN FOR THE 1995 REFUELING OUTAGE

December 5, 1994

PALISADES PLAN FOR IN-SITU DYNAMIC TESTING:

GL-89-10 provides a two stage approach to dynamic testing. The first stage employs analytical methods and extrapolations to design basis conditions, based on the best available data, to provide assurance that an MOV will operate under design basis conditions. Then, if practicable and meaningful, the MOV would be tested as close to its design basis condition as possible. The second stage consists of either full design basis testing, or obtaining the best applicable industry data to ensure valve operability at a design basis condition. Obtaining the best applicable data is acceptable if in-situ testing is not practicable or meaningful.

There are presently thirty-eight MOVs at Palisades that are within the scope of GL-89-10. The plan for completion of in-situ dynamic testing of MOVs in the 1995 Refueling Outage includes a population of nineteen MOVs, plus the possible addition of up to eight other MOVs. Dynamic testing of these MOVs will be performed per Permanent Maintenance Procedure MSE-E-21, "VOTES Diagnostic Operating Procedure" and with their respective dynamic test procedure for system lineup. Static and dynamic test results will be evaluated against predetermined values and validated prior to declaring the MOV operable. All design basis testing will be completed prior to unit startup from the 1995 Refueling Outage. The associated MOVs are:

MO-2140	BORIC ACID FEED PUMP ISOLATION
MO-2160	SIRW TO CHARGING PUMPS ISOLATION
MO-3007	HPSI TO REACTOR COOLANT LOOP 1A
MO-3008	LPSI TO REACTOR COOLANT LOOP 1A
MO-3009	HPSI TO REACTOR COOLANT LOOP 1B
MO-3010	LPSI TO REACTOR COOLANT LOOP 1B
MO-3011	HPSI TO REACTOR COOLANT LOOP 2A
MO-3012	LPSI TO REACTOR COOLANT LOOP 2A
MO-3013	HPSI TO REACTOR COOLANT LOOP 2B
MO-3014	LPSI TO REACTOR COOLANT LOOP 2B
MO-3015	SHUTDOWN COOLING INLET
MO-3016	SHUTDOWN COOLING INLET
MO-3062	HPSI TO REACTOR COOLANT LOOP 2B
MO-3064	HPSI TO REACTOR COOLANT LOOP 2A
MO-3066	HPSI TO REACTOR COOLANT LOOP 1B
MO-3068	HPSI TO REACTOR COOLANT LOOP 1A
MO-3072	CHARGING PUMP DISCHARGE TO HPSI TRAIN 2
MO-3080	HPSI NORMAL INJECTION
MO-3081	HPSI REDUNDANT INJECTION MODE

The safety functions of the following eight MOVs are presently being evaluated and could lead to the removal of these valves from the scope of GL-89-10. If the evaluation determines that the valves still provide a safety function, then all eight valves, or a justified partial set of the eight valves, will be dynamically tested in the 1995 Refueling Outage. The eight valves are the AFW FOGG valves;

MO-0743	MO-0755	MO-0753	MO-0760
MO-0748	MO-0759	MO-0754	MO-0798

The design basis capabilities of two HPSI MOVs were verified during dynamic testing performed in 1991. The two valves are;

MO-3082 and MO-3083 - HPSI HOT LEG INJECTION

There are 9 MOVs remaining within the scope of GL-89-10 that will not be dynamically tested during the 1995 Refueling Outage. The design basis capabilities of these valves will be verified by analysis, as described in the two stage approach from GL-89-10. Dynamic testing of the following valves is either not practicable or will yield insufficient test data to properly validate their set up.

PRESSURIZER PORV BLOCK VALVES - MO-1042A AND MO-1043A

The two PORV Block valves cannot be tested in-situ at Palisades without creating a significant safety risk. Design capabilities will be verified through the application of meaningful industry data. DP testing was completed on MO-1042A at the Wyle Laboratory in 1989. The valve stroked successfully during all phases of the dynamic test. However, the VOTES test results are not sufficient, due to diagnostic equipment concerns, to validate design assumptions.

LPSI PUMPS SUCTION VALVES - MO-3189, MO-3190, MO-3198, AND MO-3199

The four LPSI Pumps suction valves can be tested, but test results are not meaningful based on previous attempted dynamic testing for MO-3190 and MO-3199 in 1993 Refout. Design basis differential pressure of approximately 80% MEDP could be achieved, but flow was not established to validate design parameters. The initial unseating of the valve lead to a prompt pressure drop with insignificant flow effects that could not be sufficiently analyzed. Design basis capabilities will be verified through the use of best available industry data.

CVC SYSTEM VALVES - MO-2087, MO-2169, AND MO-2170

The three CVC valves could be tested, however test setup would require system modifications to remove check valves' internals. These valves have significant design basis margins based on their low design basis DPs. The design basis capabilities will be verified through the use of best available industry data.