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

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

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT
GENERIC LETTER 89-10 - MOV PROGRAM CHANGES AND CLARIFICATIONS

NRC Inspection Report No. 50-255/94015, dated 11/4/94, 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 MOV Program established in response to Generic Letter (GL) 89-10. Palisades provided a reply to the inspection report on 12/5/94, which also provided our testing plans for Motor Operated Valves (MOVs) in the upcoming 1995 Refueling Outage. The Palisades reply was followed by an NRC letter dated 1/26/95, which identified the final implementation schedule for the GL 89-10 Program at Palisades. This submittal provides a summary of three requested changes or clarifications associated with the contents of the documents mentioned above. The three issues are; 1) Clarification of the close out date for the programmatic actions associated with GL 89-10, 2) Removal of two valves from the identified MOV dynamic testing scope, and 3) Removal of eight Auxiliary Feedwater MOVs from the scope of GL 89-10.

CLARIFICATION OF PALISADES GENERIC LETTER 89-10 MOV PROGRAM COMPLETION DATE

As stated in the previous correspondence, prior to startup from the 1995 Refueling Outage all GL 89-10 MOVs will be verified for operability and design basis capability. This commitment will be completed in accordance with the Palisades MOV Program Procedure EM-28-01 and the established acceptance criteria in the MOV test procedures. Also, as stated in the previous correspondence, within one month of plant startup, approximately 10/15/95, we will submit the confirmation letter that indicates that the major assumptions used for design basis analysis of MOV setup and design basis capability have been confirmed.

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The only actions that will remain open beyond 10/15/95 are the final adjustments to the long term programmatic elements which will be completed by 12/15/95. The long term elements include the tracking and trending program, periodic verification testing program, and program transition to a long term maintenance mode. The identified program completion schedule has not changed and is consistent with:

1. The GL 89-10 extension request submitted on 4/28/94, and

2. The program recovery plan schedule presented to Region III personnel at the end of the 1994 MOV Inspection, and

3. The program recovery plan presented to NRC personnel at the Palisades Engineering Programs Status Update Presentation at Region III Headquarters on 12/13/94, and

4. The NRC letter from GE Grant to RA Fenech, dated 2/23/95, which docketed the presentation material from the 12/13/94 presentation.

Attachment 1 contains the original completion schedule from Revision 0 of the Program Recovery Plan, dated 9/26/94. The major milestones of the recovery plan have been implemented per this original schedule and all actions are on-track for final program close-out on or before December 15, 1995.

REMOVAL OF TWO MOVS FROM THE GENERIC LETTER 89-10 DYNAMIC TESTING SCOPE

During the development of special test procedures for the planned MOV dynamic testing it became apparent that meaningful test results cannot be obtained for two MOVs, MO-3015 and MO-3016, Shutdown Cooling Isolation Valves. Dynamic testing is not practical for these two valves and also will not yield sufficient data to properly validate design assumptions. The design basis capabilities of these two MOVs will be verified by analysis and the use of best available industry data. Further justification is provided in Attachment 2. The proposed revision to the 1995 Refueling Outage MOV testing scope is provided as Attachment 3.

REMOVAL OF EIGHT AUXILIARY FEEDWATER MOVs FROM THE SCOPE OF GL 89-10.

The testing plans contained in the December 5, 1994, submittal also indicated that eight MOVs in the Auxiliary Feedwater System (AFW) were under evaluation for removal from the GL 89-10 MOV Program. The eight MOVs (MO-0743, 0748, 0753, 0754, 0755, 0759, 0760, and 0798), are located on the discharge piping of the AFW pumps. The MOVs are associated with an abandoned nonfunctional modification that intended to automatically isolate feedwater flow to a faulted steam generator. Due to nuclear safety considerations, the automatic isolation function of the MOVs was never implemented as part of the numerous AFW system upgrade modifications that occurred during the 1983 Refueling Outage. The upgraded system design was approved by the NRC with the issuance of a Safety Evaluation Report on 4/11/84. Also, Palisades discussed the

deletion of the automatic isolation function in a Technical Specification Change Request, dated 9/17/84, that was associated with the AFW modifications. Amendment 96 to Palisades Technical Specifications was subsequently issued by the NRC on 1/30/86. Presently, the repositioning of the normally open MOVs is not identified in normal or emergency procedures. Further details pertaining to the design basis evaluation and proposed modifications for the eight MOVs is provided in Attachment 4.

SUMMARY OF COMMITMENTS

This submittal contains two new commitments. The following new commitment clarifies the completion schedule for the Palisades GL 89-10 Program and is consistent with all previous correspondence and program presentations:

1. Complete the final adjustments to the long term programmatic elements of the MOV program on or before 12/15/95. The long term elements include the tracking and trending program, periodic verification testing program, and program transition to a long term maintenance mode.

This submittal includes a second new commitment:

2. Modify the position of the power supply breakers for the eight AFW MOVs to ensure that inadvertent mispositioning cannot occur. The revised configuration and design basis for the eight MOVs will allow their removal from the Generic Letter 89-10 Program.

The present existing commitments pertaining to the MOV Program that remain unchanged are; " 1.) Complete all planned MOV dynamic testing during the 1995 Refueling Outage," and " 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 analysis and the best available industry data."

Kurt M. Haas
Plant Safety and Licensing Director

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

Attachment

ATTACHMENT 1

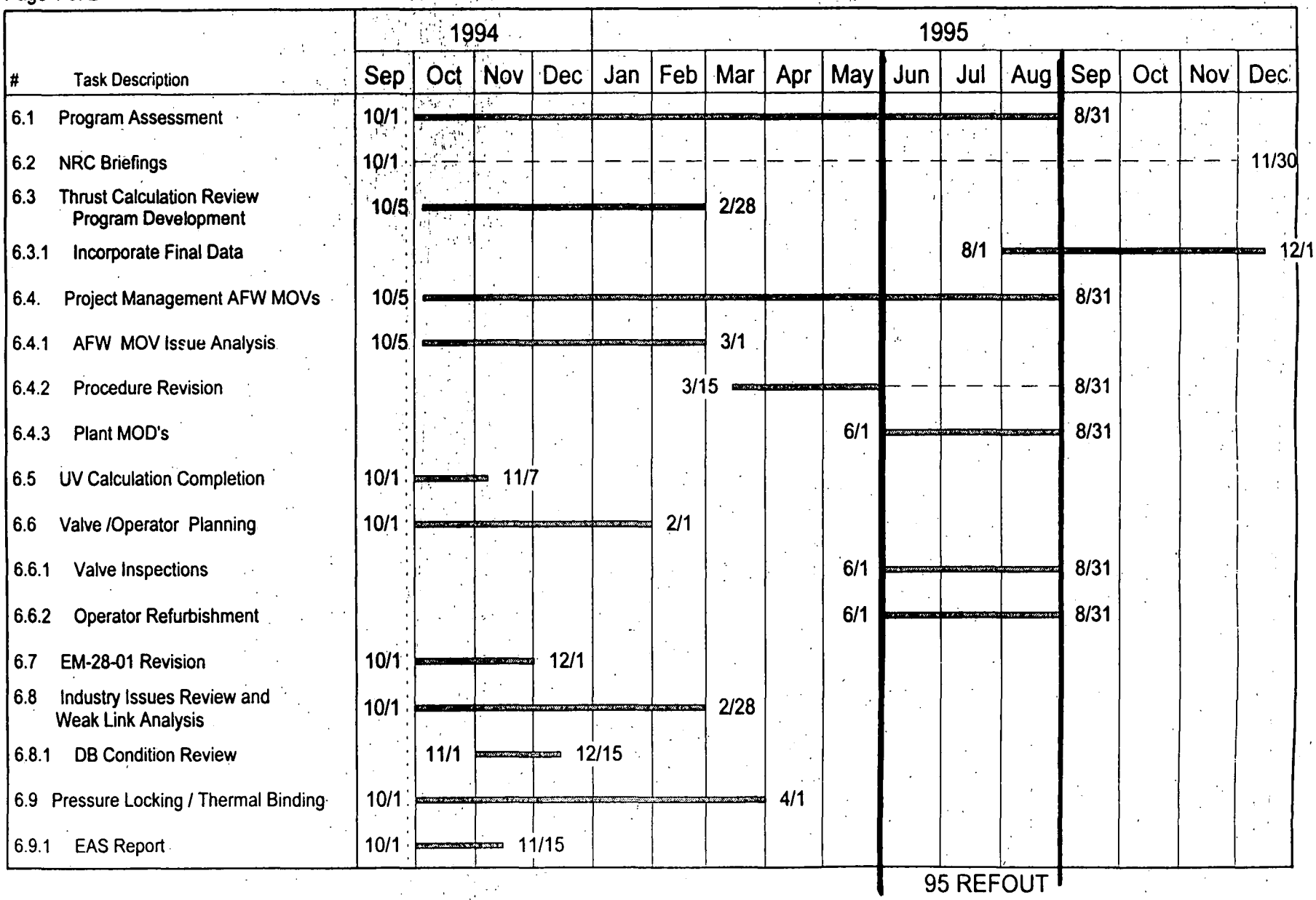
Consumers Power Company
Palisades Plant
Docket 50-255

PALISADES GL 89-10 ORIGINAL RECOVERY PLAN SCHEDULE - 9/26/94

2 Pages

Motor Operated Valve (MOV) Program Plan
Draft Schedule

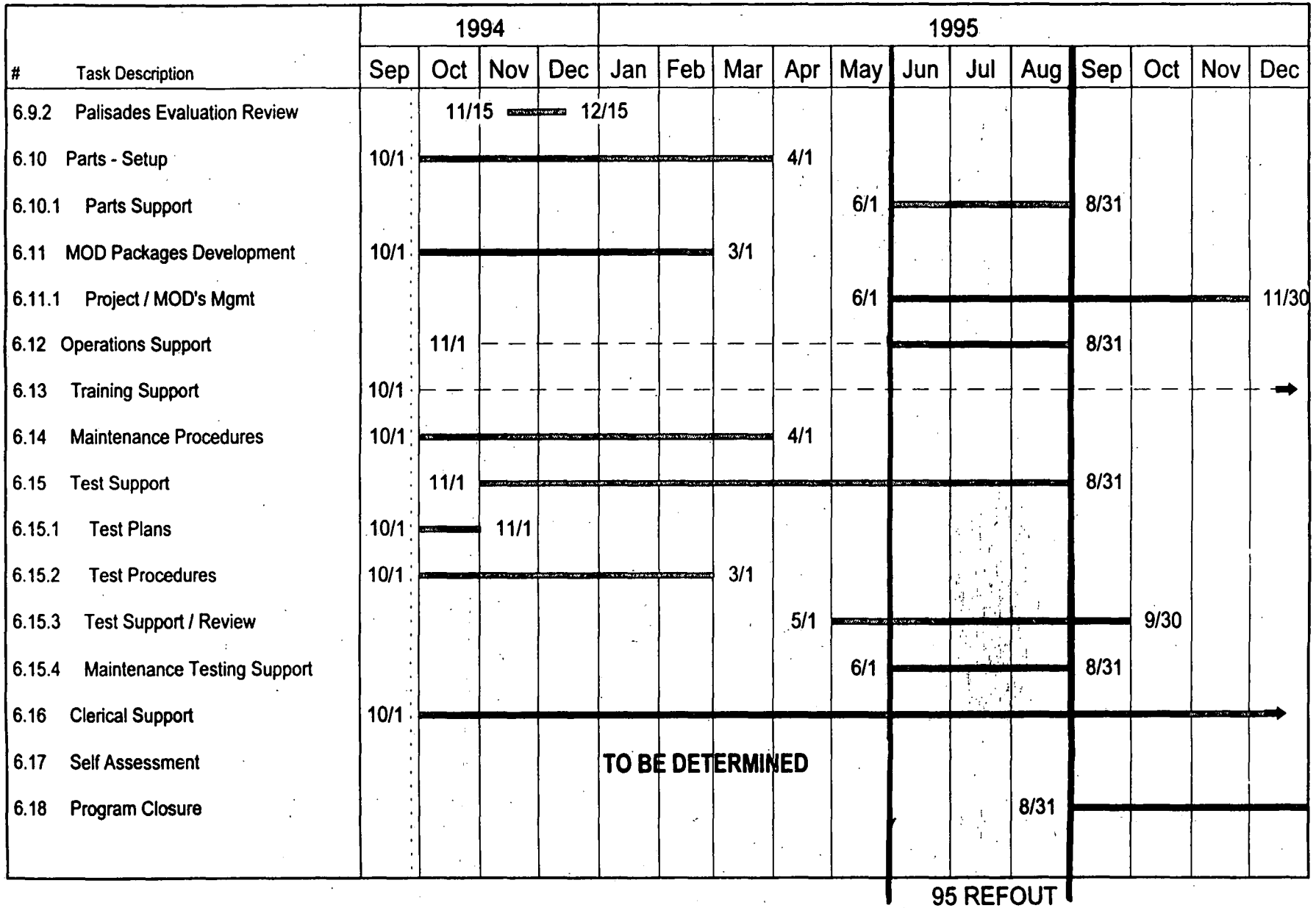
9/26/1994



ATTACHMENT 1
Page 1 of 2

Motor Operated Valve (MOV) Program Plan
Draft Schedule

9/26/1994



ATTACHMENT 1
Page 2 of 2

ATTACHMENT 2

Consumers Power Company
Palisades Plant
Docket 50-255

JUSTIFICATION FOR REMOVAL OF MOVS MO-3015 AND MO-3016 FROM PLANNED DYNAMIC TESTING SCOPE IN 1995 REFUELING OUTAGE

2 Pages

OBJECTIVE OF DYNAMIC TESTING OF MOVs

Generic Letter 89-10 provides a two stage approach to dynamic testing. The first stage employs analytical methods to provide assurance that an MOV will operate under design basis conditions. The second stage consists of full design basis testing at design conditions to validate design assumptions. Alternatives to testing are acceptable if in-situ testing is not practicable or meaningful.

VALVE DESIGN BASIS DESCRIPTION

MO-3015 and MO-3016 are in series and provide Primary Coolant System (PCS) suction isolation for the pumps in the Engineered Safeguards Safety Systems. They are normally closed at power operations and are opened when the PCS is cooled to below 300 F, and depressurized to below 270 psia. The analyzed maximum effective differential pressure (MEDP) to open the valves is 230 psid and occurs under no flow conditions. Flow is subsequently initiated by opening downstream manual valves to begin thermal equalization of the shutdown cooling system components, prior to starting a pump for shutdown cooling. The analyzed MEDP to close the valves is 255 psid and occurs when isolating the PCS from a postulated line break downstream of MO-3016.

ORIGINAL TESTING PLANS

MOVs MO-3015 and MO-3016 were placed in the dynamic testing scope because conceptually it seemed possible to set up plant conditions necessary for dynamic testing of the closing stroke. The proposed test consisted of; 1) A Low Pressure Safety Injection (LPSI) Pump recirculating PCS through the Shutdown Cooling Heat Exchangers with the reactor defueled, 2) opening an alternate suction path for the LPSI pump from the Safety Injection and Refueling Water Tank, and 3) closing one of the MOVs against shutdown cooling flow. The proposed test logic would not produce the desired MEDP, however it appeared that the test logic could produce sufficient flow to permit validation of valve factor, rate-of-loading, and coefficient of friction assumptions. Based on this intuition, the valves were placed into the planned dynamic testing scope.

PROPOSED CHANGE TO TESTING PLANS

Dynamic testing of the closing stroke for MO-3015 and MO-3016 will not yield meaningful results and also is not practical for the following reasons:

1. Operational concerns exist regarding potential pump damage during the realignment of suction sources for an operating LPSI pump. In addition, the proposed test involves the movement of large quantities of water very rapidly between the SIRW tank and the PCS. The inventory exchange would be a difficult evolution to control.

2. The best available test configuration would not generate adequate MEDP or produce enough flow to validate design assumptions. The test could only be performed with the reactor defueled and with the reactor head removed. The MEDP would be limited to the static head of water in the refueling cavity. In addition, the test relies on flow momentum through MO-3015 and MO-3016 when the LPSI suction source is realigned to SIRW tank. Since the SIRW tank level would be at an elevation greater than the refueling cavity

level, flow through the PCS shutdown cooling return line would rapidly decay when the SIRW tank is realigned to LPSI suction. During this test there would be no accurate determination of the differential pressure achieved. The objective of a dynamic test is to validate the design basis analysis and actuator setup. Presently at Palisades there is no identified test configuration, within reason, that can produce sufficient flow and differential pressure to validate design basis analysis or actuator setup.

Since the dynamic testing of these two valves is not practicable and meaningful, the MOV capabilities will be verified by evaluation techniques described in Generic Letter 89-10, including the use of best applicable industry data. These two MOVs have considerable design margin. The design margin is 380% for the opening stroke and 63% for the closing stroke. These margins are based on a conservative valve factor of 0.6. Also, other power plants with similar designs, (Bechtel designed Combustion Engineering Plants), have not dynamically tested these valves per their approved GL 89-10 Programs.

ATTACHMENT 3

Consumers Power Company
Palisades Plant
Docket 50-255

PALISADES MOTOR OPERATED VALVES TESTING REVISED PLAN FOR THE 1995 REFUELING OUTAGE

3 Pages

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 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 seventeen 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-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 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 11 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 of MO-3190 and MO-3199 in the 1993 Refout. A 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.

SHUTDOWN COOLING ISOLATION VALVES - MO-3015 AND MO-3016

The two shutdown cooling isolation valves could be tested but, due to such low differential pressure and flow conditions, the test would not yield meaningful results to validate design parameters. Also, the test would be a difficult evolution for operations personnel to control. Significant margin exists for these valves and thus 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.

The following sixteen MOVs have been determined to not be within the scope of Generic Letter 89-10. The exclusion of the first eight valves has been previously evaluated and the rationale was found proper as documented in Section 3.1 of Inspection Report 50-255/94015, dated 11/4/94. The remaining eight valves have recently been determined to meet the exclusion requirements based on their minimal safety significance and planned modifications to prevent their inadvertent mispositioning. Further details pertaining to the removal of these eight AFW valves from the Generic Letter 89-10 Program is contained in Attachment 4.

MO-3041 - Safety Injection Tank T-82A discharge Isolation
MO-3045 - Safety Injection Tank T-82B discharge Isolation
MO-3049 - Safety Injection Tank T-82C discharge Isolation
MO-3052 - Safety Injection Tank T-82D discharge Isolation
PO-1745 - Control Room HVAC outside air filter VF-26A isolation damper
PO-1746 - Control Room HVAC outside air filter VF-26B isolation damper
MO-0501 - Bypass Valve for Main Steam Isolation Valve CV-0501
MO-0510 - Bypass Valve for Main Steam Isolation Valve CV-0510

MO-0743 - AFW Isolation valve for AFW Pumps P-8A/B to Steam Generator E-50B
MO-0748 - AFW Isolation valve for AFW Pump P-8C to Steam Generator E-50B
MO-0753 - AFW Isolation valve for AFW Pumps P-8A/B to Steam Generator E-50A
MO-0754 - AFW Isolation valve for AFW Pump P-8C to Steam Generator E-50A
MO-0755 - AFW Isolation valve for AFW Pump P-8C to Steam Generator E-50B
MO-0759 - AFW Isolation valve for AFW Pump P-8C to Steam Generator E-50A
MO-0760 - AFW Isolation valve for AFW Pumps P-8A/B to Steam Generator E-50A
MO-0798 - AFW Isolation valve for AFW Pumps P-8A/B to Steam Generator E-50B

ATTACHMENT 4

Consumers Power Company
Palisades Plant
Docket 50-255

REMOVAL OF EIGHT AFW MOVs FROM GL 89-10 PROGRAM

2 Pages

AFW VALVES REMOVAL FROM GL 89-10 PROGRAM

GL 89-10 REQUIREMENTS

The original GL 89-10 document, dated June 28, 1989, states:

> "Any MOV in a safety related system that is not blocked from inadvertent operation from either the control room, the motor control center, or the valve itself should be capable of being mispositioned and should be included in the program."

In Supplement 1 to GL 89-10, dated June 13, 1990, an NRC response states:

> "One method by which a licensee may remove an MOV completely from the generic letter program is for the MOV to not be relied on to be in any particular position at any particular time and to not be taken credit for in the plant's design basis or emergency operating procedures." ... and later, "If an MOV is not intended to change positions at any time during a design basis event or in the plant emergency procedures, the licensee could remove the MOV completely from the generic letter program by preventing its inadvertent operation."

BACKGROUND

The eight MOVs (MO-0743, 0748, 0753, 0754, 0755, 0759, 0760, and 0798), are located on the discharge piping of the AFW pumps. The MOVs are normally open, which is their safety position, and presently the MOVs fall within the GL 89-10 program because they could be mispositioned. The MOVs are associated with an abandoned nonfunctional modification that intended to automatically isolate feedwater flow to a faulted steam generator. The reduced pressure sensed in a faulted steam generator would signal the appropriate MOVs for that steam generator to close. Due to nuclear safety considerations, the automatic isolation function of the MOVs was never implemented as part of the numerous AFW system modifications that occurred during the 1983 Refueling Outage. The modifications were in response to IE Bulletin 80-04 and NUREG 0737. The upgraded system design met the requirements of revision 2 of the Standard Review Plan (NUREG 0800), and the NRC approved the upgraded plant design in a Safety Evaluation Report dated 4/11/84. Palisades justified the deletion of the automatic isolation function in a Technical Specification Change Request, dated 9/17/84, that was associated with the AFW modifications.

DESIGN BASIS

The plant design basis including normal and emergency operating procedures do not require the functionality of the motor operators. The emergency operating procedures instruct the operators to isolate a faulted steam generator with the air operated flow control valves. In the event of loss of function for the air operated valves the operators are instructed to manually close the air operated valves with the local mounted handwheels. If the flow control function of the air operated valves is degraded, then the operators are instructed to manually control flow with the AFW MOVs. The MOVs have manual

handwheels to allow for manual control in this situation. Further details regarding the design basis function for these MOVs is contained in Palisades Engineering Analyses and the Safety Evaluation (50.59 review) associated with modification Specification Change SC-95-041 discussed in the following section.

MODIFICATION TO ELIMINATE MOVs MISPOSITIONING

During the 1995 Refueling Outage, modifications will be completed on the eight AFW MOVs System to eliminate their potential for mispositioning. The power supply breakers for the eight MOVs will be locked in the "OFF" position. This will disable the MOVs and prevent their mispositioning or spurious closure. Also, the manual handwheels for the eight valves will be lockwired in the open position.