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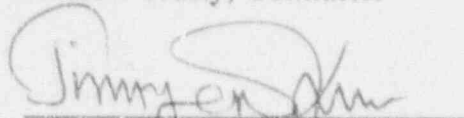
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Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Vermont Yankee Nuclear Power Station, Vernon, Vermont

Inspection Conducted: May 20 - 24, 1991

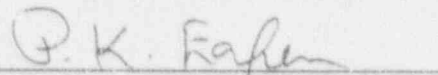
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7/11/91
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Inspection Summary: See the Executive Summary.

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EXECUTIVE SUMMARY

The Nuclear Regulatory Commission conducted a team inspection at the Vermont Yankee Nuclear Power Station on May 20-24, 1991 to assess the programs developed by the licensee in response to NRC Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance". This team inspection was accomplished in accordance with NRC Temporary Instruction (TI) 2515/109, "Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance". The generic letter and its supplements (1, 2 and 3) discuss the many factors and efforts required by licensees to develop adequate programs that will ensure design-basis operability of safety-related motor-operated valves (MOV).

Initiation of self assessment for the MOV program was noted as strength in the MOV area. While the personnel involved with the MOV program showed good knowledge and technical capabilities, the team still identified several concerns and areas needing clarifications or improvements during the course of the inspection. A summary of inspection findings is provided in enclosure 1 to this report. These findings are discussed in detail in this report.

The licensee acknowledged the inspection findings and agreed to review each item for effective resolution. Because of the weaknesses and concerns identified, the team concluded that the MOV program as being developed has not completely addressed all the recommendations of GL 89-10 and its supplements.

DETAILS

1.0 Introduction

On June 28, 1989, the NRC staff issued Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," which requested that licensees and construction permit holders establish programs to ensure that switch settings for safety-related motor-operated valves (MOV) and certain other MOVs in safety-related systems are selected, set and maintained properly. The staff held public workshops to discuss the generic letter and to answer questions regarding its implementation. On June 13, 1990, the staff issued Supplement 1 to GL 89-10 to provide the results of those public workshops. In Supplement 2 (issued on August 3, 1990) to GL 89-10, the staff stated that inspections of programs developed in response to GL 89-10 would not begin until January 1, 1991. In response to concerns raised by the results of NRC-sponsored MOV tests, the staff issued Supplement 3 to GL 89-10 on October 25, 1990, which requested that boiling water reactor licensees evaluate the capability of MOVs used for containment isolation in the steam supply lines to the High Pressure Coolant Injection and Reactor Core Isolation Cooling Systems, in the supply line to the Reactor Water Cleanup System, and in the lines to the isolation condenser, as applicable. The generic letter also recommended that each licensee with an operating license complete all design basis reviews, analyses, verifications, tests and inspections that have been instituted, within 5 years or three refueling outages, whichever is greater, of the date of the generic letter (June 28, 1989).

The NRC inspection team used Temporary Instruction 2515/109 (dated January 14, 1991, "Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance," to perform this inspection. The inspection focused on Part 1 of the temporary instruction (TI) which involves a review of the program being established by the licensee in response to GL 89-10. Part 2 of the TI, which involves a review of program implementation was not completed during this inspection as the licensee had not started the implementation of this MOV program at the time of this inspection.

2.0 Vermont Yankee's Generic Letter 89-10 Program

In its letter dated December 28, 1989, to the U.S. Nuclear Regulatory Commission, Vermont Yankee Nuclear Power Corporation responded to the generic letter. The licensee stated that their existing Bulletin 85-03 program would be extended to cover all MOVs determined to be within the scope of generic letter 89-10. The licensee committed to establishing the normal and abnormal design basis criteria for each MOV within the scope of the program.

The team reviewed the licensee's response to the generic letter and documentation describing the program established. The inspectors also discussed the program details with licensee personnel. The results of this inspection as related to each aspect of Generic Letter 89-10 are described below.

2.1 Scope and Administration of the Generic Letter Program

The Scope of Vermont Yankee's Generic Letter 89-10 MOV Program is described in the plant's "MOV Program Description For Vermont Yankee Nuclear power Station" dated December, 1990. All safety class MOVs are included within the scope of this program. A total of 83 valves is identified. Four safety-related valves were excluded from the program for the following reasons:

- RHR crossie line valve 10-20: Chained and locked shut and motor leads disconnected. Amendment No. 129 to Facility Operating License No. DPR-28 removed any surveillance requirement for this valve.
- Drywell head spray line valves 10-32 and 10-33: this line is not used and it has a blank flanged end in the drywell. Licensee's design change PDCR 91-11 (dated 2/27/91) was issued as a proposal for line removal.
- RCIC trip throttle valve 13-1: Valve is spring-closed and electrically opened. Opening logic is interlocked such that upstream valve, V-131, must be closed before 13-1 can be re-latched (opened) after a RCIC turbine trip.

The definition of the program scope contained a provision to allow partial program requirements for certain MOVs. This could create a potential for not adequately identifying all program requirements for MOVs in the future. The licensee agreed to clarify this definition to be consistent with the generic letter guidelines.

The inspectors reviewed P&IDs for the Nuclear Boiler, RHR, RWCU, RCIC, HPCI, Core Spray, and Service Water Systems and verified that all safety-related valves in these systems were included in the licensee's program or the licensee provided adequate justification for exclusion of MOVs in these systems. The inspectors however noted that the licensee uses non safety grade power and non safety-related actuators for MOVs 2-43A and B (safety-related valves with non safety actuators). However, the licensee did not document the measures to preclude inadvertent operation of these valves. The licensee agreed to address this concern.

There was a lack of detailed procedures describing how the various aspects of the design basis reviews are to be performed and by whom. The administration of the program was not clearly defined. Organizational responsibilities and interfaces with other departments were not properly described. The inspectors discussed this concern with the licensee and the licensee agreed to review and improve this area such that the intent of the generic letter will be fully met.

2.2 Design Basis Reviews

Action "a" of the generic letter, recommended that licensees review and document the design basis for the operation of each MOV within the program. This review is to determine the maximum differential pressure and flow and other design basis parameters (such as voltage) expected for normal and abnormal conditions. The licensee's MOV program description stated that for each MOV the following normal and abnormal design basis criteria would be established :

- Differential Pressure
- Line Pressure
- Flow
- Temperature
- Valve Orientation
- Minimum Voltage

However, at the time of this inspection, the licensee had not established factors other than maximum differential pressure for these valves. The inspectors concluded that the current design basis reviews were inadequate since several factors (e.g., flow, temperature, degraded voltage, harsh environment, seismic effects and emergency operating procedure considerations), were not addressed. The licensee acknowledged this conclusion and stated that design basis reviews will be re-performed, after adequate guidelines have been prepared.

2.3 Diagnostics Systems

The licensee uses MOVATS (an MOV analysis and testing vendor) diagnostic equipment to set the torque switches for MOVs in the GL 89-10 program. The torque switch setpoint is determined by measuring the thrust when the torque switch trips. The licensee strictly relied on the accuracy values for the equipment provided by MOVATS. No additional licensee reviews to assess the adequacy of the accuracies for site specific use were performed. The licensee committed to follow the industry effort to verify the accuracy of the MOVATS equipment and to incorporate the results of that effort into the site specific use of the equipment, as necessary.

2.4 MOV Switch Settings and Setpoint Control

Action "b" of Generic Letter 89-10 recommended that the licensees review, and revise as necessary, the methods for selecting and setting all MOV switch settings. These switch settings should enable the MOV to perform its safety function and/or to survive and recover from a valve mis-positioning event.

The inspectors reviewed Vermont Yankee Calculation Package VYC-418 (dated June 18, 1990), "Valve Stem Thrust." The inspectors also discussed with the licensee the process for sizing MOVs and setting the switches. MOVATS calculated the required thrust for sizing and setting the MOV for opening and closing capability using the worst case differential pressures for each MOV provided by the licensee. The licensee initially set the MOV torque switches for opening and closing the valve using the thrust obtained during the MOVATS static (zero differential pressure and flow) diagnostic testing. By adding the worst case differential pressure to both the open and close stroke, the licensee addressed the capability of the MOV to perform under its worst differential pressure conditions.

The licensee performed only two tests of motor-operated gate valves (one 3-inch and one 10-inch gate valve) in an effort to assess the applicability of the MOVATS database to more than 60 motor-operated gate valves at Vermont Yankee ranging in sizes from 3 to 28 inches. The licensee stated that no further tests of MOVs under differential pressure conditions were planned. The team found this inadequate because this test of only two valves is not a good representative sample of the valves in the program.

MOVATS estimated the minimum required thrust to operate a valve against a specific differential pressure from thrust data obtained from diagnostic tests of MOVs at nuclear power plants. MOVATS compiled test data performed under various differential pressures, and valves of different sizes and manufacturers, in its database. MOVATS used the test data to arrive at a relationship between the thrust requirement and a parameter determined from differential pressure, valve size, and system pressure. MOVATS increased its estimate of the minimum thrust by an amount to account for the inaccuracy of the MOVATS diagnostic equipment and torque switch repeatability.

The MOVATS database has been shown to be non-conservative in some cases. For example, the NRC Inspection Reports 50-348/91-201 and 50-364/91-201 concerning the GL 89-10 program documented that only two-thirds of the tested MOVs at that facility were found to have thrust requirements bounded by the MOVATS database. Additionally, the NRC staff found during an inspection of MOVATS, and documented in Inspection Report No. 99901194/91-01, that the MOVATS database was unreliable for predicting thrust requirements for MOVs because of the uncertainties regarding MOV performance characteristics.

The licensee stated that after receiving the MOVATS thrust estimate, an additional 10 percent thrust margin was suggested, but not always required to account for repeatability in the use of the MOVATS equipment. MOVATS indicated in its Users Technical Notice 89-02 (dated February 1989), "Spring Pack Response Under Differential Pressure," and Engineering Report 5.0, Revision 0, (dated January 3, 1991), "Equipment Accuracy Summary," that the "rate of loading" effect might

reduce delivered thrust by 30 percent. The amount of thrust delivered by the actuator in operating a valve under differential pressure conditions can be less than the thrust delivered under static conditions as a result of this effect. However, the licensee has not included any margin to account for this effect.

Damage to an MOV may occur if its torque switches are set to allow the actuator to deliver an excessive amount of thrust. The licensee stated that it was assuming the actuator rating to be the maximum allowable thrust for the MOV. The inspectors stated that other components (such as the motor, stem, or valve body) in the MOV were damaged when the rated thrust from the actuator was applied to certain valves during tests.

The licensee had not adequately verified that its method for sizing and setting MOVs ensures the MOV operation under worst case differential pressure and flow conditions. The inspectors did not consider this inadequacy to be an immediate safety concern because the licensee provided evidence that the torque switches for MOVs were set generally above the values derived from typical industry calculations. Nevertheless, the licensee has not demonstrated that its MOVs are sized and set with such conservatism as to ensure their operation under worst case differential pressure and flow conditions. The licensee committed to reassess its methodology in light of the inspection findings.

The licensee stated that thermal overload protection devices for the MOVs in the GL 89-10 program are used at all times. The inspectors reviewed the licensee's criteria for the selection of thermal overload devices provided in a Vermont Yankee internal memorandum, dated August 28, 1987, on MOV thermal overload heater sizing philosophy. In cases where operational needs and motor protection conflict, the licensee considers MOV operational needs to take priority. The inspectors did not identify any concerns in this area.

The licensee stated that torque switch limiter plates were removed, as necessary, to establish adequate torque switch settings. The licensee controls actuator thrust output by means of a setpoint document. Vermont Yankee Procedure No. OP 5220 (August 21, 1990), "Limitorque Operator Inspection," requires that a safety analysis be performed if torque switch settings need to be adjusted to values other than those specified in the setpoint document. This includes instances where the torque switch settings are increased above the values specified by the vendor.

The licensee controls changes to setpoint documents by means of drawing change requests. The inspectors reviewed AP 6802, Revision 17, (dated May 16, 1990) "Drawings and Aperture Cards," which identifies the requirements for control of the MOV setpoint drawings and provides the procedures for making changes to those drawings. The inspectors did not identify any concerns in this area and considered it to be a strength.

2.5 MOV Testing

Action "c" of the generic letter, recommended that licensees test MOVs in situ under their design-basis differential pressure and flow conditions. If testing in situ under those conditions is not practicable, the NRC allows alternate methods to be used to demonstrate the capability of the MOV. The NRC suggested a two-stage approach for a situation where neither design-basis testing in situ is practicable nor an alternate method of demonstrating MOV capability can be justified. With the two-stage approach, a licensee would evaluate the capability of the MOV using the best data available and then would work to obtain applicable test data within the schedule of the generic letter.

The licensee performed differential pressure testing for 4 MOVs in the program as a result of NRC Bulletin 85-03. Two of these tested valves were gate valves. The licensee does not plan to test any additional MOVs under design-basis conditions. The inspectors noted that the licensee's action is not consistent with GL 89-10 which recommended a verification that MOVs can operate under worst case differential pressure and flow conditions. The licensee committed to reassess its plans for differential pressure testing in light of the inspection findings.

2.6 Periodic Verification of MOV Capability

Action "d" of the generic letter recommended that the licensees prepare or revise procedures to ensure that adequate MOV switch settings are established and maintained throughout the life of the plant. Paragraph "j" of the generic letter recommended that the surveillance interval be commensurate with the safety function of the MOV as well as its maintenance and performance history. But in no case should the interval exceed 5 years or 3 refueling outages. Further, the capability of the MOV has to be verified if the MOV is replaced, modified, or overhauled to an extent that the test results are not representative of the MOV.

The licensee indicated that periodic static testing would be used to ensure the continued adequacy of MOV torque switch settings. The inspectors stated that the use of static testing to verify continued capability of an MOV to operate under worst case differential pressure and flow conditions is not considered adequate at this time because the relationship between the performance of an MOV under static conditions and that under design basis conditions is not adequately established. The licensee committed to reassess the plan for periodic verification of design basis capability in light of the inspection findings.

2.7 MOV Maintenance and Post Maintenance Testing

The licensee does not have any provisions in the plant's maintenance procedures to ensure that detailed procedures or appropriate technical manuals are used during MOV refurbishment activities. The MOV lubrication schedule currently being followed by the plant is every 18 months for valves in the drywell and the steam tunnel. The other MOVs (about 60) in the program are lubricated every third outage. The inspectors observed that this lubrication schedule was not consistent with the vendor's recommended frequency of every 18 months and informed the licensee of this discrepancy.

MOV post maintenance test requirements are not currently identified as part of a formal post maintenance procedure. Informal post maintenance testing guidelines are currently used, but formal procedures do not exist to ensure that all MOV related maintenance requests are reviewed against these guidelines. In addition, the inspectors evaluated the testing guidelines and found it inadequate. For example, the guidelines require only a motor load test after packing adjustment. The licensee has not demonstrated that such a test would ensure the MOV operability. Further, the licensee's post-maintenance guidelines require only a baseline diagnostic test following a complete valve replacement. This type of testing alone will not adequately verify the new valve's ability to operate under design basis conditions. The licensee has committed to address all of the above concerns.

2.8 MOV Failures, Corrective Actions, and Trending

Action "h" of the generic letter recommended that the licensees analyze each MOV failure and justify corrective action. The documentation should include the results and history of each as-found deteriorated condition, malfunction, test, inspection, analysis, repair, or alteration. All documentation should be retained and reported in accordance with plant requirements. It is also suggested that the material be periodically examined (every 2 years or after each refueling outage after program implementation) as part of the monitoring and feedback effort to establish trends of MOV operability. These trends could provide the basis for reassessment of the testing frequency for the MOVs. The generic letter indicated that a well-structured and component-oriented system is necessary to track, capture, and share equipment history data.

The inspectors reviewed AP-0200, Revision 12, (dated June 1, 1990) "Conduct of Maintenance Activities," which is a general maintenance procedure that implements controls for documenting plant equipment failures and corrective actions, including those associated with MOVs. According to AP-0200, Visi-Record Cards are used to document MOV failures and corrective actions. The Visi-Record Cards provide a

current record of scheduled and unscheduled maintenance and modification activities performed on plant equipment. The inspectors reviewed MOV failure and corrective action package MR 90-0782, which addressed a binding problem with valve V10-3813. The licensee performed a root cause analysis in accordance with AP-0200 guidelines. The inspectors found the corrective action to be acceptable.

The inspectors reviewed the licensee's program with regard to trending. AP-0200 provides the requirements for an annual assessment of all plant safety related equipment including MOVs. To verify compliance with procedural requirements, the inspectors requested documentation for trending MOV failures. The licensee presented an assessment of MOV failures issued in April 1989. No trending of MOV failures has occurred since April 1989. The licensee stated there was only one MOV failure in the past year that was caused by the lack of a stake in the motor pinion key.

The inspectors noted that the licensee's MOV trending program only addresses MOV failures. However, GL 89-10, recommended that licensees trend MOV problems and deficiencies so as to indicate the need for MOV maintenance before failure. Attachment A to GL 89-10 provides examples of MOV problems that should be considered for trending. The inspectors noted that the licensee's practice of trending only MOV failures does not meet the intent of GL 89-10.

The licensee is planning to replace the Visi-Record Cards by September 1, 1991, with the Maintenance Planning and Control (MPAC) computer data base. The MPAC system will provide a current record of scheduled and unscheduled maintenance and modification activities performed on equipment. This data base replaces paper work associated with VYAPF 0021.01 "Vermont Yankee Corrective Maintenance Request." The licensee plans to make the system functional using only the current data. The MPAC system will provide trending from its data base. The inspectors noted that the historical data from the Visi Cards was not scheduled to be incorporated into the MPAC data base. The licensee agreed to reconsider the trending plans in light of the inspection findings.

2.9 Training and Control of Contractors

The inspectors evaluated the licensee's MOV training courses, facilities, and knowledge of its training personnel related to the implementation of the GL 89-10 program. The inspectors reviewed training requirements specified in "Plant Mechanic Training Program Description," (PMTPD) Revision 4, and the course descriptions, and then interviewed training personnel, and toured the training facility.

The current training program requires that licensee personnel complete job-specific performance requirements that take approximately 8 months to complete. MOV performance requirements comprise a part of the overall maintenance training program. Mandatory classroom training for basic MOV maintenance is not required.

In addition, the MOV maintenance training program lacks provision for mandatory refresher training.

Licensee personnel received classroom training for the use of MOVATS equipment and the analysis of MOVATS data. However, periodic refresher training is not currently a part of the formal diagnostic training program. The licensee conducted one refresher class for the use of MOVATS equipment since the initial training place. Additional technical training is not required for OJT instructors and evaluators other than completing the OJT program and participating in instructor/evaluator training. This additional training provides instruction on conducting and observing an OJT session, but does not assess the instructor's technical knowledge. The licensee provides on-site MOV refurbishment training for contractor personnel and also relies on the certification of personnel by their respective organizations. This on-site training is approximately 2 days long. The class receives an oral exam, as a group, after the classroom instruction. The licensee was unable to provide evidence of the review or audit of the qualifications of MOVATS and Anchor Darling employees used during the last outage. The licensee agreed to reassess its training needs considering the concerns identified.

2.10 Industry Experience and Vendor Information

The inspectors reviewed AP 0028, revision 13, (dated February 8, 1991), "Operating Experience Review and Assessment/Commitment Tracking." The inspectors noted that the procedure for the distribution of technical information to the licensee's Training department is not always implemented. The licensee's practice requires that the appropriate department supervisor make a decision whether to forward Category A documents (documents that require specific response or action) to Training. The inspectors noted that there was no specific guidance to make this determination.

The inspectors reviewed the licensee's evaluation of Limatorque Part 21, (dated March 20, 1990), "Motor Pinion Keyway Depth." The licensee's evaluation included a review of pinion part numbers to determine if any related pinion gears were on site. The licensee determined that no application of a 41 tooth motor pinion gear was in use. The inspectors did not identify any concerns in this area.

The inspectors requested the licensee's evaluations of other Limatorque Part 21 Notifications and MOVATS Engineering Report 5.0, (January 3, 1991), "Equipment Accuracy Summary." The licensee had evaluations for all the documents except the MOVATS Engineering Report. The inspectors determined that this document was not received by the licensee's MOV maintenance or engineering personnel probably because of its recent release date. The inspectors noted that the licensee has not established formal mechanisms to obtain timely updates from the suppliers of MOV equipment and services. Additionally, the licensee has a formal procedure requiring

that personnel receiving copies of any technical information directly from vendors would forward such information to the Assessment Coordinator, but this procedure was not being strictly followed by some licensee personnel.

2.11 Schedule

In response to GL 89-10, the licensee committed to complete the MOV program by June 28, 1994, except for completion of the two stage testing approach, as outlined in the licensee's response dated December 28, 1989. The NRC indicated in response dated June 11, 1990, that an extension beyond the five years may be possible. At the time of this inspection, the licensee could not provide the details for meeting the proposed schedule. The licensee representatives stated that they would reassess the program schedule in light of this inspection findings and the NRC letter dated June 11, 1990.

3.0 Generic Letter 89-10, Supplement 3

The inspectors reviewed the licensee's responses to Supplement 3 to GL 89-10 and found that additional information was needed to complete the review. Specifically, the licensee's calculations and explanation of the bases for those calculations of the thrust capability for the Recirculation Loop pump discharge MOVs; evaluation by the licensee of the consequences of leakage from valves with close torque switches bypassed until 99% closure; and an evaluation by the licensee of the effects of the rate of loading phenomenon on MOV capability were not adequately documented. The licensee agreed to establish and provide this information for NRC review.

4.0 Walkdown

The inspectors conducted a walkdown of several MOVs at Vermont Yankee. The inspectors inspected RHR MOV V10-184 with its switch compartment cover removed. The inspectors did not identify any problems during the walkdown.

5.0 Conclusions

From this inspection, the team arrived at the following conclusion: The licensee has not completely developed a program that will verify the capability of MOVs in safety-related piping systems to operate, if necessary, under worst case conditions. The licensee's MOV program has not adequately addressed all the recommendation in GL 89-10 as detailed in this report. An internal audit recently completed by the licensee identified many of the same findings as this NRC inspection. Vermont Yankee has committed to reconsider the MOV program in light of the findings of this NRC inspection and to provide an appropriate schedule for its revised program.

6.0 Exit Meeting

The inspectors met with those denoted on Attachment A on May 24, 1991 to discuss the preliminary inspection findings as detailed in this report.

Appendix A

Persons Contacted

Vermont Yankee Nuclear Power Corporation

- *B.R. Buteau, Engineering Director, Vermont Yankee
- *J.H. Callaghan, Lead Systems Engineer, Yankee Atomic
- *D.A. Dyer, Quality Services Engineer, Yankee Atomic
- *C.H. Hansen, Senior Systems Engineer, Yankee Atomic
- *F.J. Helin, Project Engineer, Vermont Yankee
- *J.R. Hoffman, Engineering Manager, Yankee Atomic
- *S.J. Jefferson, Assistant Plant Manager, Vermont Yankee
- R. Lepriore, Maintenance Supervisor, Vermont Yankee
- C.J. Nichols, Senior Maintenance Engineer, Vermont Yankee
- *R.D. Pagodin, Technical Services Superintendent, Vermont Yankee
- *J.P. Pelletier, Vice President, Engineering, Vermont Yankee
- D.A. Reid, Plant Manager, Vermont Yankee
- D. Stafford, Technical Training Supervisor, Vermont Yankee
- D. Taylor, Maintenance Engineer, Vermont Yankee
- L.A. Tremblay, Senior Licensing Engineer, YNSD
- G. Wilder, Maintenance Training Coordinator
- R.J. Wanczyk, Operations Superintendent, Vermont Yankee

Nuclear Regulatory Commission

- *P. Eapen, Section Chief, Region 1
- *H. Eichenholz, Senior Resident Inspector
- A. Igne, ACRS staff member
- *W. Lanning, Deputy Director, Region 1
- C. Michaelson, Member, ACRS
- *E. Sullivan, Section Chief, NRR
- J. Johnson, Branch Chief, Region 1

* Denotes those present at the exit meeting held on May 24, 1991.

Enclosure 1

Summary of Inspection Findings

1. Program Scope

Finding: The licensee's description of the scope of the MOV Program contained a provision to allow partial program requirements for certain valves. This could create a potential for not adequately identifying all program requirements for Safety-Related MOVs in the future. (Section 2.1)

Generic Letter Provisions: Paragraphs 1 and 2 in the "recommended actions" section of the generic letter define the scope of the program to include all safety-related and any other MOVs in all safety-related system that are not blocked from inadvertent operation. NRC's responses to questions 3, 4, and 5 in supplement 1 to the generic letter provided clarification regarding the valves to be included in the program.

2. Program Administration

Finding: Organizational responsibilities and interfaces are not clearly defined. (Section 2.1)

Generic Letter Provisions: Paragraph 8 in the "background" section of the generic letter discusses the complexity of the MOV program and the need for controlling interfaces among the organizations involved in the implementation of the program.

3. Design Basis Review

Finding: The licensee has only addressed the differential pressure for the MOV thrust calculations during design basis reviews. (Section 2.2)

Generic Letter Provisions: NRC's response to question 16 in supplement 1 to generic letter 89-10 indicates that licensees should consider all relevant factors such as differential pressure, flow, degraded voltage, seismic loads, and ambient temperature.

4. Diagnostic System

Finding: The licensee has not established the accuracy of the diagnostics system, and its effect on switch settings. (Section 2.3)

Generic Letter Provisions: The importance of establishing, setting, and maintaining accurate switch settings is discussed in "recommended actions" b and c of the generic letter. NRC's response to question 30 in supplement 1 to generic letter 89-10

discusses the use of diagnostics.

5. Area: Switch Settings, Testing, and Periodic Verification

Finding: The MOVATS data base has not been adequately reviewed and verified for site specific use. The "rate of loading" effect was not considered. The licensee only reviewed the potential damage to the actuator under the rated thrust. However, the licensee did not verify that motor, stem, disc, valve body and other components of the MOV would not be damaged when the rated thrust of the actuator is applied. (Section 2.4) The licensee has tested only 4 of the 83 safety-related MOVs under design basis conditions and had no plans to test additional valves. (Section 2.5) Switch setting methodology has not been adequately verified by valve testing. The licensee's plan to use static testing for periodic verification has not been adequately justified. (Section 2.6)

Generic Letter Provisions: Recommended action "c" of the generic letter indicates that MOV switch settings should be established to ensure high reliability of safety-related MOVs and the MOVs should be demonstrated to be operable by testing at the design basis differential pressure and/or flow where such testing is not precluded by the existing plant configuration. Recommended action "d" of the GL indicates that stroke time testing (commonly performed at static conditions) is not adequate. Additionally, NRC's responses to questions 26 and 27 in supplement 1 to the generic letter provide guidance on the factors to be considered in demonstrating the applicability of test data between MOVs. NRC's response to question 33 further discusses periodic verification.

6. Area: Maintenance

Finding: The licensee does not have strict guidelines to ensure that detailed procedures or appropriate Technical Manuals are used during MOV refurbishment. The licensee has not documented the justification for the current lubrication schedule (every third outage) for about 60 MOVs in the program. The licensee does not have adequate or controlled guidelines to ensure that proper Post-Maintenance Test will be performed following maintenance activities on MOVs that could effect the switch settings. (Section 2.7)

Generic Letter Provisions: Recommended action "d" of the generic letter indicates that procedures should be in place to ensure that correct switch settings are determined and maintained throughout the life of the plant.

7. Trending

Finding: The licensee's trending method does not ensure that all MOV problems and deficiencies will be adequately trended. (Section 2.8)

Generic Letter Provisions: Recommended action "h" of the generic letter indicates that each MOV failure and corrective action taken, including repair, alteration, analysis, test and surveillance should be analyzed, justified, documented and periodically examined as part of a monitoring and feedback effort to establish trends of MOV operability. NRC's response to question 39 in supplement 1 to the generic letter provided guidance on trending MOV data within the program.

8. Control of Contractors

Finding: The licensee was not able to provide evidence of their review or audit of the qualifications of MOVATS and Anchor Darling personnel used as contractors during the last outage. (Section 2.9)

Requirement: 10 CFR 50, Appendix B, Criterion VII, Control of Purchased Material, Equipment and Services, requires measures to control such services.

9. Generic Letter 89-10, Supplement 3

Finding: The licensee was not able to justify the capability calculations for the Recirculation pump discharge MOVs. The licensee has not considered the consequences of valve leakages for the valves for which "close torque" switches are bypassed through 99% closure. The licensee also did not consider the effects of the "rate of loading" on MOV capability. (Section 3)

Generic Letter Provisions: Supplement 3 to the generic letter requested that licensees prioritize their Generic Letter 89-10 program completion for the RCIC, HPCI, and RWCU valves. Recommended action "b" of the generic letter indicates that correct switch settings should be established.

10. Schedule

Finding: Based on the several issues discussed during this inspection, it is evident that the licensee's current generic letter 89-10 program schedule commitments require re-evaluation.

Generic Letter Provisions: Recommended actions "l" and "m" of the generic letter require that licensees inform the NRC in writing, of their MOV program schedule and any changes to the established schedule.