APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-382/92-02

Operating License: NPF-38

Licensee: Entergy Operations, Inc.
P.O. Box B
Killona, Louisiana 70066

Facility Name: Waterford Steam Electric Station, Unit 3

Inspection At: Taft, Louisiana

Inspection Conducted: January 27-31, 1992

Inspectors: C. J. Paulk, Acting Team Leader, Plant Systems Section, Division of Reactor Safety

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Approved: T. F. Westerman 2-7-92
T. F. Westerman, Chief, Plant Systems Section, Division of Reactor Safety — Date

Inspection Summary

Inspection Conducted January 27-31, 1992 (Report 50-382/92-02)

Areas Inspected: Special, announced team inspection of the licensee's program for implementing the requirements of Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance." Also, licensee actions on previously identified items were evaluated.

Results: The licensee had initiated a comprehensive program for motor operated valves (MOVs) that generally met the recommendations and intent of GL 89-10. There was, however, some ambiguity in the licensee's program plan. A summary of inspection results with areas recommended for improvement is noted below:

The licensee's GL 89-10 Program Plan was in some areas ambiguous. The inspectors noted that the scope as defined in the plan could be interpreted to be inconsistent with the licensee's commitment to the GL. The licensee indicated that the scope would be revised to be consistent with the GL and the program to be implemented. (paragraph 3.3.1)

Weaknesses noted in the licensee's methodology for MOV sizing and switch settings included the failure to consider all design basis parameters and the failure to develop a systematic methodology to verify assumed margins. (paragraph 3.3.2)

The licensee had not considered the results of its MOV tests in verifying the assumptions used in their design basis calculations and did not have procedures developed for the feedback of information from these tests. (paragraph 3.3.3)

The licensee did not have justification for the planned use of static testing for the purpose of periodically verifying MOV capability. (paragraph 3.3.4)

The development of a post-maintenance test matrix was considered a strength. (paragraph 3.3.4)

The trending of MOV information was not fully developed. (paragraph 3.3.5)

The control of setpoints was considered a weakness. (paragraph 3.4.1)

Personnel training for MOV activities was considered a strength. (paragraph 3.4.2)

The use of vendor information and diagnostics were considered appropriate. (paragraphs 3.4.3 and 3.4.4)

A walkdown of the plant revealed good housekeeping with regard to external MOV practices. (paragraph 3.5)

The program was being managed in a proactive manner with excellent resources and knowledgeable personnel.

Each of the areas of weakness noted above were discussed with and acknowledged by the licensee. The licensee indicated each would be evaluated and addressed.

DETAILS

1. PERSONS CONTACTED

Entergy Operations, Inc.

*R. Azzarello, Director, Design Engineering
*D. Baker, Director, Operations Support and Assessments
*T. Brennan, Design Engineering Manager
W. Brian, Plant Engineering Superintendent
*O. Bullich, Design Engineering Supervisor
*R. Burski, Director, Nuclear Safety
*A. Cilluffa, Maintenance Engineering Supervisor
*W. Day, Station Supervisor
*E. Fields, Senior Engineer, Design Engineering
*T. Gates, Licensing
*T. Gaudet, Operational Licensing Supervisor
P. Gropp, Supervisor, Systems Engineering - Mechanical
*J. Hoffpauir, Maintenance Superintendent
B. Holloway, Maintenance Engineer, Arkansas Nuclear One
*J. Hologa, Principal Engineer, Design Engineering
*J. Houghtaling, Director, Modifications and Construction
*L. Laughlin, Manager, Licensing
*K. Le, Maintenance Engineer
*T. Leonard, Manager, Technical Services
*A. Lockhart, Manager, Quality Assurance
J. Meibaum, System Engineer
*D. Packer, General Manager, Plant Operations
*R. Peters, Electrical Maintenance Superintendent
*J. Poff, Electrical Supervisor
*R. Prados, Senior Engineer
*P. Prasankumar, Principal Engineer, Design Engineering
J. Roberts, Quality Assurance
W. Rogers, Supervisor, Design Engineering, Arkansas Nuclear One
*P. Stanton, Design Engineer
*R. Starkey, Manager, Operations and Maintenance

Houston Light and Power

*M. Berg, Engineering Manager
*S. Phillips, Licensing
*C. Rowland, Motor Operated Valve Program Coordinator

NRC

*M. Satorius, Project Engineer
*W. Smith, Senior Resident Inspector
*D. Wigginton, Project Manager

*Denotes persons present at the January 31, 1992, exit interview.

The inspectors also contacted other licensee personnel during the course of the inspection.

2. FOLLOW-UP ON PREVIOUSLY IDENTIFIED ITEMS

2.1 Follow-up (92701)

2.1.1 (Closed) Inspection Follow-up Item 382/8939-02, Evaluate In-Service Procedures for Diverse Reactor Trip System

During the inspection for the licensee's compliance with 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants," the inspectors found that the licensee had not completed the development of test procedures for periodic testing.

The inspector reviewed maintenance instruction MI-003-336, Revision 0, "Diverse Reactor Trip System (DRTS) Loop Check and Calibration ATS IP9120 A or B;" maintenance instruction MI-003-338, Revision 0, "Functional Test of (ATWS) Diverse Reactor Trip and Diverse Emergency Feedwater Actuation System;" and, operating procedure OP-904-017, Revision 0, "Surveillance Procedure Anticipated Transient System Check." The inspector found that these procedures met the requirements for testing the ATWS systems and did not identify any concerns.

2.1.2 (Closed) Inspection Follow-up Item 382/9023-04, Adequacy of the Station Grounding Grid Design.

During the electrical distribution safety functional inspection, questions were raised relating to the capability of the station grounding grid. The licensee performed additional calculations to demonstrate that the station grounding grid was capable of performing its design function. The inspector reviewed the licensee's documentation and did not identify any concerns.

2.1.3 (Closed) Unresolved Item 382/9016-02, Calibration of Resistance Temperature Detectors (RTDs)

During a previous inspection, an inspector found that the licensee appeared to be performing channel checks of the reactor coolant system RTDs instead of calibrations as required by the Technical Specifications. The licensee had documentation from its vendor that indicated the RTDs would remain within the desired accuracy band for 5 years. The licensee intended to replace all of the RTDs at a 5 year interval.

The licensee subsequently had a contractor perform RTD cross calibrations on all the RTDs during the last refueling outage. The licensee replaced three RTDs on the basis of the results of the contractor's test. The affected RTDs were then calibrated in a laboratory and were found to be within design specifications although they did not meet the acceptance criteria of the contractor's test. The licensee stated that it would perform RTD cross calibrations every refueling outage and initiated Repetitive Task 020574 to perform these calibrations.

2.2 Follow-up on Corrective Actions for Violations (92702)

(Closed) Violation 382/8937-01, Failure to Follow a Procedure and the Use of an Inadequate Procedure.

Installation records for spring hanger HVSH-4028 indicated that quality control (QC) personnel had not recorded the as-installed hot and cold settings as procedurally required. Also, procedure MM-012-004, "Fabrication and Installation of Piping," did not contain adequate QC inspection acceptance criteria for spring hanger settings. As a result, spring hanger HVSH-4028 was installed incorrectly.

Spring hanger HVSH-4028 was reset to its design configuration. An engineering analysis showed that the affected portions of the containment atmosphere release system were still operable and not overstressed with HVSH-4028 in its as-found configuration. A memorandum explaining the violation was reviewed as required reading by quality assurance, maintenance, and construction personnel. Procedure MM-012-001, Revision 1, "Installation Procedure - Pipe Hanger Support Installation, Fabrication, and Removal," which was referenced in procedure MM-012-004, was revised to include definitive QC inspection acceptance criteria for spring hanger settings.

3. GENERIC LETTER (GL) 89-10 "SAFETY-RELATED MOTOR-OPERATED VALVE TESTING AND SURVEILLANCE" (2515/109)

3.1 Background

On June 28, 1989, the NRC issued GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," which requested licensees and construction permit holders to establish a program to ensure that switch settings for safety-related motor-operated valves (MOVs) and certain other MOVs in safety-related systems were selected, set and maintained properly. The NRC held public workshops to discuss the generic letter and to answer questions regarding its implementation. On June 13, 1990, the NRC issued Supplement 1 to GL 89-10 to provide the results of those public workshops. In Supplement 2 to GL 89-10 (August 3, 1990), the NRC 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 NRC 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 several systems. In Supplement 3, the NRC indicated that all licensees and construction permit holders should consider the applicability of the information obtained from the NRC-sponsored tests to other MOVs within the scope of GL 89-10 and should consider this information in the development of priorities for implementing the generic letter program.

In GL 89-10, the NRC requested licensees to submit a response to the generic letter by December 28, 1989. The licensee submitted a response to the generic letter on December 26, 1989, stating that it would meet the recommendations and schedule of the generic letter. The NRC acknowledged that commitment in a reply on May 21, 1990. Consistent with Item 1 of GL 89-10, the NRC stated that the licensee should incorporate any differences between its program and the generic letter in the licensee's program description.

3.2 Inspection Plan

The inspectors followed Temporary Instruction 2515/109 (January 14, 1991), "Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance," in performing this inspection.

The inspection focused on Part 1 of the temporary instruction (TI) which involved a review of the program being established by the licensee in response to GL 89-10. The inspectors did not address Part 2 of the TI because of the early stages of implementation of the licensee's GL 89-10 program.

3.3 Generic Letter 89-10 Areas

As required by Section 04.01 of the TI, the inspectors reviewed the licensee's commitment to the generic letter. The inspectors reviewed the licensee's GL 89-10 MOV program description and supporting documentation. In addition, the inspectors discussed the program in detail with licensee personnel.

As required by Section 04.02 of the TI, the inspectors reviewed each aspect of GL 89-10. The inspection findings are described below.

3.3.1 Scope of the Generic Letter Program

The NRC's position is that the scope of GL 89-10 include all safety-related MOVs and other MOVs that are position-changeable in safety-related piping systems. Through Supplement 1 to the generic letter, the NRC defined "position-changeable" as any MOV in a safety-related piping system that was not blocked from inadvertent operation from the control room.

The licensee identified 86 MOVs (including 31 gate valves, 28 butterfly valves and 27 globe valves) to be within the scope of its GL 89-10 program. The licensee stated that its GL 89-10 program included MOVs in safety-related systems with active safety functions, and MOVs in safety-related systems that had no active safety function but which could be mispositioned. The inspectors reviewed the "Waterford 3 Steam Electric Station Generic Letter 89-10 MOV Program Plan," Revision 0, and "Emergency Operating Procedure - Emergency Entry Procedure," OP-902-000, Revision 4. The inspectors also reviewed system drawings for the safety injection (Drawing G-167), emergency feedwater (Drawing G-153), component cooling water (Drawing G-160), and chemical and volume control (Drawing G-168) systems and did not identify any MOVs that were improperly excluded from the licensee's GL 89-10 program.

The licensee's GL 89-10 Program Plan provided a description of the program scope that could be interpreted to be inconsistent with the licensee's commitment to GL 89-10. The licensee agreed that the Program Plan could be read as being inconsistent with their commitment and stated that the Program Plan would be revised to be consistent with its commitment and programs they were implementing. The revision of the Program Plan will be reviewed during a future inspection of the GL 89-10 program.

The licensee stated that it had reviewed its plant procedures (including emergency operating procedures) to ensure that MOVs with safety functions (in safety-related or non-safety related systems) had been included for all design basis scenarios. From the review of emergency procedures, the inspectors raised a question as to the need to include the feedwater regulating bypass MOVs in the program. The licensee stated that it was reviewing the feedwater bypass MOVs to determine whether they would be subject to the full GL 89-10 program.

Conclusions:

Once the scope of the Program Plan is revised to be consistent with the licensee's previous commitment and the program being implemented, the scope of the licensee's GL 89-10 program will be consistent with the intent of GL 89-10.

3.3.2 Design-Basis Reviews and MOV Switch Settings

In recommended action "a" of GL 89-10, the NRC requested the review and documentation of the design basis for the operation of each MOV within the generic letter program to determine the maximum differential pressure and flow (and other factors) expected for both normal operations and abnormal conditions. In recommended action "b" of GL 89-10, the NRC requested licensees to review, and to revise as necessary, the methods for selecting and setting all MOV switches.

The licensee incorporated the recommendations of GL 89-10 regarding the performance of design basis reviews and the calculation of appropriate MOV sizing and switch settings under one task action. The licensee's Program Plan stated that various design basis parameters will be determined for use in the sizing and switch setting calculations or in the setup of design-basis tests for MOVs. In addition to the Program Plan, the inspectors reviewed "Refueling 1 and 2 Design Basis Reviews," Instruction No. 133-91-01.03, Revision 2; "Refueling 3, 4 and 5 Design Basis Reviews," Instruction No. 133-91-01.04, Revision 2; "Seismic Review," Instruction No. 133-91-01.2, Revision 0; "Electrical Design Calculations - Control Circuit Review," 133-91-02.2, Revision 0; "MOV Design Basis Review," Calculation SI.005, Revision 0; "Verification of Dynamic Test Results (SI-407B)," undated; "Motor Operated Valve Data/Record Forms," ME-007-028, no revision; and "Administrative Procedure MOV Setting, Signature Analysis and Trend Evaluation," MD-001-031, Revision 0.

The licensee had completed the calculations of design-basis differential pressure for all MOVs within its GL 89-10 program. The licensee did not have a specific procedure for the determination of the design-basis differential pressure for MOVs, but had calculation packages that described the basis for the differential pressure determination. The licensee stated that it had reviewed plant procedures (including emergency operating procedures) to ensure that the calculated differential pressures bounded the differential pressure that the MOVs could be operated against during design-basis scenarios. The licensee stated that inadvertent operation had been considered in determining the worst case differential pressure for each MOV. The inspectors noted, however, that some design basis calculations had significantly different differential pressures for opening and closing the MOV. The licensee stated that these calculations would be reviewed to determine whether inadvertent mispositioning of the MOV could affect the differential pressure determination.

The licensee had not performed calculations of the various design basis parameters (other than differential pressure) such as fluid flow and temperature, ambient temperature, and seismic/dynamic conditions. These various parameters are needed to ensure that the test conditions are representative of design-basis conditions or that the test results can be used to demonstrate that the MOV would operate under design-basis conditions. The licensee stated that those parameters would be addressed as part of its

GL 89-10 program. The licensee's consideration of various design-basis parameters will be reviewed during a future inspection.

The licensee had completed most of the calculations to verify the adequacy of size and switch settings for all MOVs in its GL 89-10 program. The licensee was using the standard industry equation, and assumed a range of valve factors (0.3 or 0.5) and stem friction coefficients (0.15, 0.2, 0.25 or 0.30) depending on MOV capability. The licensee, however, did not include a specific margin for rate of loading, diagnostic equipment inaccuracy, ambient temperature effects, or other uncertainties. The licensee adjusted torque switches using diagnostic equipment such that the thrust output would be near the maximum allowable value. The licensee indicated that significant margin existed for most MOVs (30 to 40 percent) because of their conservative design. The inspectors considered the licensee's failure to quantify the margin for various uncertainties in order to provide for the incorporation of the results of its dynamic tests into its sizing and switch setting methodology a weakness.

On the basis of analyses of dynamic tests conducted in response to Bulletin 85-03 and the GL 89-10 design-basis review calculations, the licensee determined that shutdown cooling header isolation MOVs SI-407A/B were marginal and that modifications to the MOVs should be considered. The licensee had not verified some of its assumptions (such as a 0.15 stem friction coefficient), and had applied diagnostic equipment error values published by the vendor MOVATS which are being evaluated by the MOV Users Group of nuclear power plant licensees. The licensee stated that at least one of these MOVs would be tested before the end of the September 1992 refueling outage and that appropriate actions would be taken. The licensee prepared interim guidance for operator action when placing the shutdown cooling system in operation should the valves fail to operate.

The licensee did not have a mechanism to provide for the incorporation of the results of its MOV tests or those of other organizations into its methodology for sizing and setting MOVs. The inspectors found that the licensee did not have a mechanism to evaluate the operability of MOVs on the basis of test results. The licensee stated that it was developing a method to provide for such feedback and analysis of test data.

The licensee was completing its degraded voltage evaluations. The licensee stated that ambient temperature effects on ac motor performance will be addressed when the ongoing Limitorque study is completed. The licensee assumed a 0.4 locked rotor power factor for its motors in calculating the voltage reductions due to cable losses. The licensee did not have documentation to support this assumption. The licensee has included degraded motor control center voltage, cable resistance at elevated temperatures, and the resistance of thermal overload devices in the voltage drop calculations. For most of the MOVs in the GL 89-10 program, the voltage will be maintained above 90 percent of rated motor voltage; however, as a conservatism, the licensee assumed a voltage penalty for these valves. The licensee did not include the test voltage in its test procedures. This affected the licensee's ability to verify that the MOV would not be damaged and could recover if inadvertently operated during periods when the terminal voltage was below 90 percent.

The licensee bypassed thermal overload protection for MOV motors during accident conditions. This practice was based on Regulatory Guide 1.106, "Thermal Overload Protection for Electric Motors on Motor-Operated Valves."

Conclusions:

The inspectors considered the failure to ensure that all appropriate design basis parameters were considered in verifying that MOVs would operate under design basis conditions a weakness. Another weakness was that the licensee had not developed a systematic methodology to verify that the assumed margin for various uncertainties was adequate as a result of its own MOV tests and industry information.

3.3.3 Design-Basis Differential Pressure and Flow Testing

In recommended action "c" of the generic letter, the NRC requested licensees to test MOVs within the generic letter program in situ under their design basis differential pressure and flow conditions. If testing in situ under those conditions was not practicable, the NRC would allow alternate methods to be used to demonstrate the capability of the MOV. The NRC suggested a two stage approach for a situation where design basis testing in situ was not practicable and, at this time, an alternate method of demonstrating MOV capability could not 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 committed to the GL 89-10 recommendations including testing MOVs under design-basis differential pressure and flow conditions where practicable in its response to GL 89-10. The inspectors reviewed "Motor Operated Valve Diagnostic Static and Differential Pressure Test of Safety Related NRC Bulletin 85-03 MOVs," CI-WA-28799, Revision 5; "Maintenance Procedure using MOVATS 2150/2151 System for Testing of Motor Operated Valves," ME-007-027, Revision 5; "MOV Setting, Signature Analysis and Trend Evaluation," ME-007-028, Revision 0; "ITI MOVATS Equipment Accuracy Summary," ER-5.0, Revision 0; "Engineering Procedure Special Test Procedures," UNT-007-022, Revision 4; "Nonconformance/Indeterminate Qualification Process," NOP-019, Revision 2.2; and, "Waterford 3 Steam Electric Station Generic Letter 89-10 MOV Test Plan," draft Revision 0. The inspectors found several plant documents (such as the Administrative Procedure MD-001-031 and the draft Test Plan) that could be interpreted as conflicting with the licensee's commitment to test where practicable. However, the licensee reiterated during the inspection its commitment to test MOVs where practicable. The licensee stated that it would ensure that its program documents are consistent with its written commitment to GL 89-10.

The licensee has tested all of the MOVs within its GL 89-10 program under static conditions using MOVATS diagnostic equipment. The licensee performed tests of 19 MOVs under dynamic conditions with MOVATS diagnostic equipment in response to Bulletin 85-03. The licensee identified only MOV SI-407B as being marginally sized as a result of that testing. The licensee stated that MOV SI-407B demonstrated an actual valve factor of approximately 0.4 during the test. The licensee stated that those 19 MOV tests were not performed with the

rigor that will be applied as part of its GL 89-10 program and will likely be repeated using VOTES diagnostic equipment.

The licensee had prepared basic procedures for the setup and conduct of the MOV tests. However, the inspectors pointed out several weaknesses in the draft test plan, such as (1) not evaluating the adequacy of design basis reviews when test conditions were found to be more severe, (2) not justifying assumptions regarding the significance of fluid flow on thrust requirements, (3) not considering the adequacy of the test setup for butterfly valves, and (4) not addressing the future verification of design-basis capability where old dynamic tests will be relied upon to satisfy the initial testing under GL 89-10.

The licensee had not developed acceptance criteria to determine the capability of the MOV to perform under design basis conditions as a result of an evaluation of the test results. Those acceptance criteria will also be needed to address potential operability issues. Further, the licensee had not developed a mechanism for the feedback of the test results into its MOV sizing and switch setting methodology or for addressing any operability issue arising from that feedback for other MOVs within the GL 89-10 program. The licensee indicated that it was in the process of developing acceptance criteria and a feedback mechanism. This will be a review item in a future inspection.

Conclusions:

The inspectors identified that the licensee had not considered the results of its MOV tests in evaluating the adequacy of its assumptions and did not have procedures developed for the feedback of information from those tests into its MOV sizing and switch setting methodology. These weaknesses will be reviewed during a future inspection.

3.3.4 Periodic Verification of MOV Capability

In recommended action "d" of the generic letter, the NRC requested that licensees prepare or revise procedures to ensure that adequate MOV switch settings were determined and maintained throughout the life of the plant. In paragraph "j" of the generic letter, the NRC recommended that the surveillance interval be based on the safety importance of the MOV as well as its maintenance and performance history, but that the interval not exceed 5 years or 3 refueling outages. Further, the capability of the MOV will need to be verified if the MOV is replaced, modified, or overhauled to an extent that the existing test results would not be representative of the MOV.

The inspectors discussed the periodic verification of MOV capability with licensee personnel and reviewed the licensee's Program Plan. The licensee indicated that it will attempt to rely on static tests of MOVs to periodically verify MOV design basis capability. The licensee did not provide justification for the use of data from static tests to predict the performance of MOVs under design basis conditions. The licensee stated in its Program Plan that periodic verification would be performed every other refueling outage which is consistent with the frequency recommended in GL 89-10. The licensee's justification of static testing for periodic verification will be reviewed during a future inspection.

As described in the Planning Information Guide Notebook, Revision 1 - "MOV Maintenance and MOVATS Tests Corrective and Preventive Maintenance Work Scope," the licensee has developed a matrix for guidance in the performance of post maintenance tests to verify MOV design basis capability. The inspectors noted that the matrix provided for thrust verification after valve packing replacement or adjustments. The inspectors considered the development of the matrix to be a strength. The inspectors did not identify any concerns regarding post-maintenance testing, but noted the need for the licensee to ensure that test guidance reflected the new type of diagnostic equipment to be used.

Conclusions:

The inspectors found that the licensee did not have justification for its use of static testing for periodic verification methodology. The inspectors considered the matrix of required post maintenance testing a strength.

3.3.5 MOV Failures, Corrective Actions, and Trending

In recommended action "h" of the generic letter, the NRC requested that licensees analyze or justify each MOV failure and 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 was 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 a licensee revision of the testing frequency established to verify periodically adequate MOV capability. The generic letter indicated that a well-structured and component-oriented system would be necessary to track, capture, and share equipment history data.

The inspectors discussed the licensee's corrective action in response to MOV failures and trending of MOV problems with plant personnel. In addition to the Program Plan, the inspectors reviewed "Administrative Procedure Equipment Failure Trending," UNT-006-003, Revision 1; "Administrative Procedure Motor Operated Valve Maintenance and Trending," UNT-005-024, Revision 0; and, "Administrative Procedure Root Cause Investigation and Analysis," UNT-006-016, Revision 0. The inspectors did not identify any concerns regarding the licensee's response to MOV failures. However, the significant amount of corrective maintenance activity reinforces the need for a strong trending program. The licensee was in the process of improving its trending of MOV failures and degradation. The process, however, was highly informal and relied on the dedication of a single individual to provide for an adequate trending of MOV problems. This will be a review item for a future inspection.

Conclusions:

The licensee's trending program was weak in the written guidance provided for the performance of MOV trending to meet the intent of GL 89-10.

3.3.6 Schedule

In GL 89-10, the NRC requested that licensees complete all design-basis reviews, analyses, verifications, tests, and inspections that were initiated in order to satisfy the generic letter recommended actions by June 28, 1994, or three refueling outages after December 28, 1989, whichever was later.

The licensee committed to the schedule of GL 89-10 in its response to the generic letter. In its Program Plan, the licensee indicated that the completion of the program within that schedule was only a goal. The inspectors noted that the Program Plan was inconsistent with the licensee's commitment to GL 89-10. The licensee stated that the Program Plan would be revised to be consistent with its GL 89-10 commitment. The licensee was in the process of changing the type of MOV diagnostic equipment which may cause a need to repeat the 19 MOV dynamic tests performed to date. The inspectors found that the licensee has an aggressive test schedule. Nevertheless, the licensee may have difficulty meeting its commitment to the schedule of GL 89-10 unless continued, strong management support is provided.

Conclusions:

The licensee was attempting to meet its schedule commitments to GL 89-10, and will need continued management support.

3.4 Other MOV Areas Addressed

Section 04.03 of the TI lists certain aspects of the licensee's overall program that should be reviewed by the inspectors, as appropriate.

3.4.1 MOV Setpoint Control

The licensee had performed design basis calculations for the MOVs in its GL 89-10 program. From these calculations, the licensee defined a range for the torque switch to operate in. The inspectors found, however, that the licensee recorded the torque switch setting and the thrust at which the torque switch tripped in the work document. The licensee, therefore, did not have the switch settings in a central location. The inspectors considered this a weakness in the licensee's control of switch setpoints. The licensee acknowledged this weakness and stated that MOV setpoint control would be strengthened.

3.4.2 Training

The inspectors discussed the licensee's training program with licensee personnel, reviewed training outlines and records, and toured the training facility. The inspectors found that the licensee had a comprehensive MOV training program in place. The training consisted of MOV mechanical and electrical classes which included written examinations, on the job training, and an oral board examination prior to qualification. The licensee was contracting with ITI-MOVATS to provide a two week training program for MOV testing activities.

The inspectors noted that the licensee had identified the need for an MOV refresher course. The licensee stated that, starting this spring, technicians

qualified on MOVs and MOV testing will be required to take a refresher course for MOV diagnostic and test systems. The technicians will be required to attend the refresher training approximately every six months.

Conclusions:

The inspectors considered the licensee's training program, with the refresher training, to be a strength. A weakness was identified in the licensee's administrative control of switch setpoints.

3.4.3 Industry Experience and Vendor Information

The inspectors reviewed the licensee's response to various industry and vendor communications including 10 CFR Part 21 reports, Limitorque maintenance updates, and NRC Information Notices pertaining to MOVs. In all cases, the licensee had received, reviewed, and evaluated the information; determined plant-specific applicability; and, taken appropriate actions as necessary. Based on the documentation reviewed, these actions were timely and aggressive.

3.4.4 Use of Diagnostics

The licensee was using ITI-MOVATS as an MOV diagnostic tool, but was in the process of converting to the VOTES system. The licensee stated that elements of the ITI-MOVATS equipment would still be used to measure spring pack displacement and thus retain a torque measurement capability to complement the stem thrust measurements available with the VOTES equipment. The correlation of torque to thrust would permit a direct measurement of the stem friction coefficient. It may also enable a reliable correlation of valve performance at static and dynamic conditions to support periodic verification testing under static conditions. This correlation would have to be demonstrated by the licensee's testing program and evaluated during a future inspection.

The inspectors discussed with the licensee the prudency of reperforming dynamic tests of MOVs previously tested with the ITI-MOVATS equipment in order to establish a consistent database under the VOTES system. The licensee stated that this issue was under review.

The inspectors reviewed procedures and training associated with the ITI-MOVATS system. The inspectors also observed valve strokes on a mock-up MOV used for training. The licensee had established excellent controls over its use of the ITI-MOVATS equipment. A similar review of the controls for the VOTES system will be performed during a future inspection.

3.4.5 Control of MOV Modifications

The inspectors reviewed two design modification packages. The first, "Limitorque Operator Output Upgrade and Grease Lock Modification," DCP-3241, Revision 2, had two parts. The first part was for the modification of eight safety-related MOVs by replacing components in the Limitorque actuators to increase the available torque. The second part was for the modification of five safety-related valves by modifying the spring pack and installing a grease relief kit in order to comply with the Limitorque Maintenance Update Letter 88-2 concerning hydraulic lock. The second modification package,

"Hydraulic Grease Relief Kit Modification," DCP-3290, Revision 1, was for the modification of an additional eight MOVs that were subject to hydraulic lock.

The inspectors did not identify any concerns with these modifications. The inspectors considered the modifications to have been well engineered and developed within the guidelines of plant procedures.

3.4.6 MOV Maintenance

The inspectors reviewed the licensee's preventive maintenance program and procedures for MOVs. The licensee stated that preventive maintenance tasks were performed based on vendor recommendations and maintenance history. The licensee's frequency for lubricating the valve stem and sampling grease was 18 months, which is in accordance with Limitorque recommendations. Grease hardening was observed, however, in spring packs during MOVATS testing of MOVs SI-MVAAA331A and SI-MVAAA332A.

The inspectors reviewed Administrative Procedure "MOV Testing, Maintenance and Trending Program," UNT-005-024, Revision 0, and found that the licensee intends to perform the verification of MOV switch settings at a 3 year frequency, or at every other refueling outage. The procedure stated that if the maintenance was postponed, the task performance would not exceed a 5 year interval in accordance with the recommendations of GL 89-10.

The inspectors also reviewed "Maintenance for Motor Operated Valves," ME-007-008, Revision 8, which provided instructions for limit and torque switch checkouts and adjustments. The inspectors found that any MOVs that had been tested and set up with the ITI-MOVATS equipment were to be retested under the procedure "Using MOVATS System for Testing of M.O.V.," ME-007-027.

3.5 Walkdown

The inspectors conducted a walkdown of several MOVs, however, the inspectors were not able to inspect inside the limit switch compartments. The inspectors did observe that the valve stems were generally clean and appeared to be properly lubricated. The inspectors considered the cleanliness of the plant to be very good.

3.6 Conclusions

The inspectors considered the licensee to have made a good beginning in developing a comprehensive program in accordance with its commitments to GL 89-10. The inspectors concluded that the licensee's program would meet the intent of GL 89-10 upon completion of corrective actions and development of certain portions of its program identified during the inspection. The areas of the licensee's GL 89-10 program not currently developed will be reviewed during a subsequent inspection of the implementation of the licensee's program.

4. EXIT INTERVIEW

An exit meeting was held with those persons denoted in paragraph 1 on January 31, 1992. The scope and findings of the inspection were summarized. No proprietary information was provided to the inspectors.