

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No.: 50-461/91019(DRS)

Docket No.: 50-461

License No.: NPF-62

Licensee: Illinois Power Company  
500 South 27th Street  
Decatur, IL 62525

Facility Name: Clinton Power Station

Inspection At: Clinton Site, Clinton, IL 61727

Inspection Conducted: October 7-11, 1991

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10/30/91  
Date

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10/30/91  
Date

Inspection Summary

Inspection conducted during October 7-11, 1991 (Report No. 50-461/91019(DRS))

Areas Inspected: Announced safety inspection for the initial licensee's response to Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve (MOV) Testing and Surveillance", (2515/109).

Results: No violations were identified; one deviation was identified (Paragraph 2.c.).

The inspection disclosed that the licensee's MOV program prepared in response to GL 89-10 did not encompass the full scope of work identified in the GL.

The licensee demonstrated weaknesses in the following areas:

- \* The licensee failed to recognize the magnitude of the work involved in the GL 89-10 program and did not apply adequate resources at an early stage to ensure its timely completion.
- \* The licensee's self-assessment program was ineffective during the early stages of the program; however, exceptional improvement was demonstrated immediately prior to the inspection.

The licensee demonstrated a strength in the following areas:

- \* The licensee recently applied extensive resources in the areas of personnel and management to accelerate action in this area to meet the original completion date suggested in GL 89-10.

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## DETAILS

### 1. Persons Contacted

#### Illinois Power Company (IP)

- \*J. S. Perry, Vice President
- #K. A. Baker, Supervisor, Engineering Assurance
- #R. P. Bhat, Supervisor, Mechanical Design
- \*#W. P. Clark, Supervisor, Plant Maintenance
- \*#J. G. Cook, Plant Manager
- #W. Donovan, Staff Specialist, Licensing
- \*D. E. Korneman, Director, Systems and Reliability
- #F. Edler, Project Manager
- \*C. E. Elsasser, Director, Planning and Scheduling
- \*#S. T. Harrison, Staff Engineering, Licensing
- \*L. Holtmau, Project Engineer, Independent Safety Engineering Group
- #D. L. Holtzsoher, Director, Nuclear Safety
- #R. T. Kerester, Director, Engineering Project
- #D. E. Korneman, Director, Systems and Reliability Engineering
- \*#J. R. Langley, Director Design and Analysis, Engineering
- #J. Lewis, Principal Assistant to the Vice President
- #J. H. Mansker, Director, Planning
- \*#J. A. Miller, Manager, Nuclear Systems Engineering Department
- \*#K. S. Moore, Director, Plant Technical Staff
- \*#R. W. Morgenstern, Manager, Nuclear Training
- #J. P. O'Brien, Supervisor, Independent Safety Engineering Group
- #S. Paige Hall, Director, Nuclear Program Assessment
- \*J. F. Palchak, Manager, Nuclear Planning & Scheduling
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- \*#F. A. Spangenberg, Manager, Licensing and Safety
- \*#J. V. Sipek, Supervisor, Regional Regulatory Interface
- \*#R. E. Wyatt, Manager, Quality Assurance
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#### U. S. Nuclear Regulatory Commission (NRC)

- #M. A. Ring, Chief, Engineering Branch, DRS
- #P. G. Brochman, Senior Resident Inspector
- \*F. Brush, Resident Inspector
- \*K. Salehi, Reactor Inspector

\*Denotes those attending the entrance meeting on October 7, 1991.

#Denotes those attending the exit meeting on October 11, 1991.

2. Inspection of the Program Developed in Response to Generic Letter (GL) 89-10 (2515/109)

a. Background

On June 28, 1989, the NRC issued GL 89-10, "Safety-Related Motor-Operated Valve (MOV) Testing and Surveillance", which requested addressees to establish a program to ensure that switch settings for safety-related MOVs and certain other MOVs in safety-related systems are selected, set and maintained properly.

The NRC inspectors followed Temporary Instruction (TI) 2515/109 (January 14, 1991), "Inspection Requirements for GL 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance," in performing this inspection. The inspection focused on Part 1 of the TI which involves a review of the program being established by the licensee in response to GL 89-10. The licensee had not progressed sufficiently to perform Part 2 of the TI which involves a review of program implementation.

b. Supplement 3 to GL 89-10

In letters to the NRC on December 13, 1990 and March 11, 1991, the licensee stated that the 4 MOVs (RCIC 1E51F063 and 1E51F064, and RWCU 1G33F001 and 1G33F004) within the scope of Supplement 3 to GL 89-10 had been evaluated and no deficiencies were identified. The NRC inspectors reviewed the licensee's evaluation of those MOVs. With respect to the Reactor Water Cleanup (RWCU) system MOVs, the inspectors considered the MOVs to be marginal in being capable of performing their design basis functions when assuming the licensee's original design differential pressure (dp), a 0.5 valve factor, a 0.15 stem friction coefficient, voltage greater than 90% of the motor rated voltage such that no degraded voltage penalty is included, and the availability of stall efficiency. The inspectors indicated that consideration of more severe dp, ambient temperature effects, rate of loading effects, and internal MOV motor heating from starting at degraded voltage could result in the RWCU MOVs being determined incapable of performing their design basis functions. Further, the licensee's calculations indicated the required thrust and torque to exceed the actuator ratings. The inspectors considered this to constitute a deficiency in the RWCU MOVs. In response to the inspectors' concerns regarding the RWCU MOVs, the licensee developed an action plan to evaluate the RWCU MOVs in detail by the Spring of 1992 consistent with

the schedule of Supplement 3 to GL 89-10. The licensee should inform its NRC project manager and NRC Region III when its detailed re-evaluation of the RWCU MOVs is available for NRC review.

The NRC inspectors reviewed the licensee's evaluation of the Reactor Core Isolation Cooling (RCIC) system MOVs and found them to have more margin than the RWCU MOVs. However, the licensee should address any information obtained from its RWCU action plan that suggests that the RCIC MOVs might be incapable of performing their design basis functions. Further, the inspectors noted a deficiency in that the required thrust for the RCIC MOVs exceeded the actuator rating. The inspectors indicated that the licensee will be expected to resolve the concerns regarding MOV capability and actuator rating deficiencies on a prompt basis.

The NRC inspectors also noted that the dp used in the calculations for the Supplement 3 RWCU and RCIC valves was the nominal system pressure for each system and not the reactor system pressure which could be encountered under design basis conditions. The inspectors concluded that the licensee's plant-specific safety assessment did not ensure valve operability. The licensee reevaluated their approach to the safety assessment and incorporated the maximum reactor vessel pressure of 1375 psig. The licensee noted, however, that due to reactor safety valve setpoints actual reactor pressure should not exceed 1103 psig. The licensee decided to reduce the valve factor used for the valves to 0.36 for the RWCU valves and 0.41 for the RCIC valves. The inspectors agreed that with the reduced valve factors, and the conservative pressure of 1375 psig assumed, the valves were shown to be operable.

c. GL 89-10 Program Review

The NRC inspectors reviewed the licensee commitments to GL 89-10. The licensee submitted their response to the GL to the NRC by letters dated December 29, 1989 and April 4, 1991, and committed to meet the intent of GL 89-10.

The NRC inspectors reviewed the licensee's "Motor Operated Valve Program Description and Responsibilities for the Clinton Power Station (CPS) GL 89-10 Program," and supporting documentation. In addition, the inspectors discussed the program with licensee personnel. As discussed in detail in this report, the

inspectors considered the licensee's program description to be deficient in areas such as design basis reviews, MOV sizing, switch setting calculations, schedule of design basis testing, corrective action in response to MOV failures, and trending of MOV deficiencies. The licensee attributed the deficiencies to its late start and lack of initial understanding of the GL 89-10 program requirements. The licensee did not attend any of the GL 89-10 workshops which were presented by the NRC to help licensees better understand these requirements. The inspectors found that, contrary to statements in the April 4, 1991 letter, the licensee did not have an adequate program description available for review at the time of the inspection. This constituted a deviation from the licensee's commitments to GL 89-10 (461-50/91019-01).

In GL 89-10, the staff requested that licensees complete all design-basis reviews, analyses, verifications, tests, and inspections that were initiated in order to satisfy the GL recommended actions by June 28, 1994, or 3 refueling outages after December 28, 1989, whichever is later. The licensee has committed to meet the GL 89-10 schedule. However, the licensee indicated in a letter to the NRC dated April 4, 1991, that the effort needed to complete the design basis reviews was underestimated and indicated that these reviews would be complete June 28, 1994. The NRC inspectors noted that ordinarily the design basis reviews would be completed significantly prior to the completion of the GL 89-10 program so that information obtained from the reviews could be used to establish testing criteria. The licensee indicated that the actual scheduled completion date for the design basis reviews is January 1993. The licensee reaffirmed its commitment to meet the June 28, 1994 completion date for its GL 89-10 program.

The NRC inspectors reviewed the licensee's "Motor Operated Valve Program (GL 89-10) Schedule." The licensee's schedule indicated that all design basis testing was planned for the last refueling outage. This is inconsistent with the staff's response to Question 44 in Supplement 1 to GL 89-10 which suggested that all testing should not be planned for the last outage. Such a schedule does not allow for correction of individual MOV problems or feedback of test information to validate the thrust calculation methodology. The licensee agreed to consider performance of testing prior to its last refueling outage.

(1) Scope of the GL Program

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

The NRC inspectors reviewed and discussed with the licensee the scope of the licensee's program as described in its "Generic Letter 89-10 Scope Document". The licensee's scope document includes a list of MOVs within the scope of the GL 89-10 program. There are 287 safety-related MOVs at Clinton Station, of which, 231 MOVs are in the GL 89-10 program. The licensee has decided to exclude 46 position-changeable MOVs from its GL 89-10 program based on an appeal of this issue by the BWR Owners' Group. The inspectors advised the licensee that they would be expected to comply with the results of the appeal when the results are released. The licensee plans to encompass possible valve mispositioning of MOVs that are within the scope of its GL 89-10 program. Ten other valves were removed for reasons within the guidance of GL 89-10. The inspectors reviewed system drawings of the Main Steam, Reactor Water Clean Up, and Feedwater systems to sample for completeness of the MOV list. Based on the review and the discussions, the inspectors determined that the scope of the licensee's program was consistent with the guidance of GL 89-10, with the exception of position-changeable valves.

(2) Design Basis Reviews

The NRC inspectors discussed design basis reviews with licensee personnel. The results of the different areas reviewed by the NRC inspectors are discussed below.

(a) Differential Pressure Requirements

The NRC inspectors found that the licensee had not prepared procedures for the performance of design basis reviews. However, the licensee had prepared a set of general guidelines for the determination of worst case (bounding) dp for MOVs within the

program. The inspectors noted that the licensee had not addressed other design basis parameters (such as fluid flow, fluid temperature, and ambient temperature) in the guidelines. The inspectors also noted that the guidelines were not clear regarding the consideration of normal and abnormal conditions. The licensee indicated that fluid flow, fluid temperature and ambient temperature effects on ac and dc motors would be addressed as appropriate in its calculations.

(b) Req. Voltage Capability

The NRC inspectors evaluated the licensee's methodology for evaluating the capability of MOVs to achieve the required thrust. The licensee indicated that its studies to determine the minimum voltage available at each MOV within the GL 89-10 program were in progress. The inspectors found that the licensee's Updated Safety Analysis Report (USAR) was unclear on page 8.3-10 in that it implied that motors for MOVs could produce full rated torque at 75% voltage. The licensee stated that those motors are not qualified to produce full rated torque at 75% voltage and that the USAR would be clarified.

(c) Completed Design Basis Review

The licensee had completed one bounding dp calculation package for two Feedwater system valves, 1B21F065A and 1B21F065B. The NRC inspectors reviewed the package and discussed its contents with the licensee. The inspectors noted that the calculation included design parameters such as fluid temperature and water hammer, and found the final analysis of bounding dp to be conservative. However, the inspectors noted some conceptual deficiencies in some of the analyses pertaining to interconnecting systems (interconnecting system analysis was not used in the final conclusion). For example, the licensee assumed shut-off head for pumps in interconnecting systems downstream of the feedwater valves in lines that had fluid flow. Furthermore, the licensee assumed the pressure just downstream of the valves to be at the pump shut-off head

pressure. This would result in reducing the dp across the valve inappropriately since the actual pressure downstream of the valve would be significantly less than that assumed. The inspectors cautioned the licensee to account for line losses due to flow and to use the actual pump discharge pressure where appropriate.

The licensee indicated that in some instances the bounding dp derived in the design basis review calculations would result in unrealistically high dp across the MOVs. The licensee indicated that a "refined" dp calculation may be performed to be used in lieu of the bounding dp value. The refined calculation would incorporate head loss due to flow and other parameters in order to reduce the calculated maximum dp across the valve. The NRC inspectors cautioned the licensee that in most cases flow in piping upstream of the MOVs would not exist due to the closed position of the valve and that head loss due to flow could not be considered in those instances.

(3) MOV Switch Settings

The NRC inspectors discussed the licensee's process for sizing MOVs and setting their switches with licensee personnel. The licensee's "position paper" ("CPS Positions On Technical Issues Related To GI 90-10 Design Basis Review", dated October 7, 1991) on stem factors stated that the stem factor used in its calculations would be based on the best available data in the industry. The inspectors stated that the licensee will be expected to justify quantitatively for the Clinton Station the use of any stem friction coefficient less than the typical conservative 0.20 value. The inspectors also noted that the licensee will be expected to continue to demonstrate an effective stem lubrication program including the justification of the assumed stem friction coefficient at the end of the stem lubrication interval.

The licensee's position paper on valve factors stated that the licensee would use the best available data and would justify the

selected valve factors. The NRC inspectors indicated that, in addition to industry information, the licensee should use data from its own design basis tests in confirming its selected valve factors.

The licensee also stated that margin to account for the rate of loading phenomenon was not currently included in the thrust calculations. The rate of loading phenomenon can reduce the thrust delivered by the motor operator under design basis conditions below that observed at static conditions. The licensee stated that industry efforts concerning rate of loading (which are scheduled for completion in 1994) would be followed. The NRC inspectors stated that the licensee will need to justify its consideration of rate of loading on a more timely basis.

(4) Design Basis Differential Pressure and Flow Testing

The NRC inspectors reviewed the licensee's program and discussed the licensee's method of demonstrating the capability of MOVs within the GL program with plant personnel. The licensee was performing diagnostic tests under static conditions for each MOV within its GL 89-10 program. The licensee stated that design basis testing will be performed for each MOV within the GL 89-10 program where practicable, except when its testing reveals that some MOVs have significantly oversized motor operators. The licensee should clarify its Program Description to reflect this intent. The inspectors stated that GL 89-10 recommended performing design basis testing in situ where practicable because of the uncertainties surrounding the standard MOV sizing and switch setting calculations. The licensee will need to justify, using actual Clinton Station test data, its assumption that specific MOVs are sufficiently oversized to obviate the need for design basis testing.

The licensee had assumed that it might be possible to test only 10% of the MOVs within the program at or near design basis conditions, based on statements made by other

licensees in the past. The NRC inspectors considered this estimate to be low and probably insufficient to establish an adequate database for evaluating MOVs that cannot be tested under design basis conditions. The licensee had not identified MOVs to be tested, prepared procedures for design basis testing, or established acceptance criteria.

(5) Periodic Verification of MOV Capability

The licensee planned to perform static tests of MOVs every 5 years or three refueling outages in an effort to demonstrate their continued capability to perform their functions under design-basis conditions. The NRC staff does not accept static tests to demonstrate design basis capability at this time because of the uncertainties in the relationship between the performance of MOVs under static and design basis conditions.

d. Associated Programmatic Reviews

The NRC inspectors reviewed other licensee programs associated with MOVs.

(1) Design Control for Thermal Overload Protection

The NRC inspectors discussed the design control of thermal overloads with the licensee. The licensee indicated that thermal overload devices for MOVs were active during MOV testing and normal operations, but were intended to be bypassed for accident conditions. The licensee noted that the reactor operator was required to ensure that the thermal overloads were bypassed following completion of MOV manipulations. However, it is possible that a thermal overload may be accidentally left in the normal position, leaving the thermal overload in the circuit. The inspectors referred the licensee to the GL 89-10 recommendation that all MOV switches (including thermal overload devices) be evaluated for proper settings. The inspectors recommend that the licensee re-evaluate its policies and practices regarding thermal overload devices.

(2) MOV Setpoint Control

The NRC inspectors discussed MOV setpoint

control with the licensee. The licensee relied on vendor supplied minimum required thrust values and minimum and maximum torque switch settings and set their MOVs accordingly. The licensee used diagnostic equipment to verify that the actuator supplied the minimum required thrust after all significant maintenance or repairs.

The NRC inspectors reviewed the licensee's Torque Switch Setting List (June 4, 1991) and found that the licensee did not have a documented basis for the settings. Further, the torque switch listing had not included consideration of the inaccuracy of the diagnostic equipment in its maximum settings.

The NRC inspectors noted that "as-found" and "as-left" torque switch settings were recorded prior to, and after diagnostic testing. However, the duration between diagnostic test runs for a given MOV may be several years. Furthermore, the licensee did not record, monitor or verify torque switch settings during the routine 18 month maintenance cycle. The NRC inspectors encouraged the licensee to record and verify torque switch settings during the periodic maintenance of the MOVs to improve confidence in its MOV setpoint control program. The licensee was also encouraged to trend torque switch settings based on the 18 month recorded readings.

(3) Inservice Testing (IST)

An IST inspection was performed at Clinton Station in March 1991. The licensee was found to have implemented an effective inservice testing program. Details of that inspection may be found in NRC Inspection Report Number 50-461/91005(DRS). In response to a weakness identified in that inspection report, the licensee summarized subsequent work in internal letter I10-91(06-14)-6, Y-97196 dated June 14, 1991. The NRC inspectors reviewed that letter; CPS Condition Report 1-91-03-002; CPS Procedure No. 1011.05, Section 8.3.7.5; and the ISI Manual, Section H. The documents indicated that no erroneous evaluations had occurred as a result of the erroneous calibration

standard and that adequate requirements exist to preclude future errors of this type. No further action is considered necessary on this matter.

(4) Maintenance

The NRC inspectors reviewed the licensee's procedures for the overhaul of MOVs within its GL 89-10 program. The licensee did not have a specific schedule for the overhaul of MOVs within its program, but based the need for overhaul on the preventive maintenance results. The inspectors considered this practice to be deficient because degradation of MOVs at other nuclear plants was not identified by preventive maintenance or diagnostic equipment. The licensee should consider the establishment of a periodic overhaul frequency consistent with its experience at the Clinton Station.

The NRC inspectors noted that the overhaul procedures did not provide details for identifying and responding to spring pack relaxation. The licensee stated that it had purchased a spring pack tester which will be incorporated into the procedure. The inspectors stated that if a spring pack is found to have relaxed, the licensee will be expected to evaluate the operability of the MOV prior to the overhaul to determine the generic implications of the deficiency to other MOVs and to consider the adequacy of the overhaul frequency. The licensee stated that preventive maintenance and stem lubrication were performed on the MOVs in its GL 89-10 program every 18 months.

The licensee was revising its guidelines for the performance of post maintenance testing. The NRC inspectors cautioned the licensee regarding the use of electrical current traces for post maintenance testing. The licensee indicated that it had allowed valve packing torque to be adjusted to the original value without post maintenance testing. The inspectors stated that such practice has not been demonstrated to maintain the same valve packing load and that the licensee will be expected to justify this practice.

(5) Training

The NRC inspectors discussed the Clinton Station training practices with licensee personnel, reviewed training outlines and records, and toured the training facility. The inspectors identified no concerns in this area.

(6) Followup and Trending of MOV Maintenance and Problems

The NRC inspectors reviewed the most recent Nuclear Plant Reliability Data Systems (NPRDS) failure report for MOVs at the Clinton Station. Although the failure frequency was shown to be slightly below the industry average, the identified failures reflected the need for the licensee to continue to improve its MOV activities.

The NRC inspectors reviewed Maintenance Work Request (MWR) C58196 that was initiated when RHR 1E12F024B would not close under flow conditions. The licensee determined that the torque switch setting had to be increased. The inspectors considered the MWR to be weak in its consideration of the applicability of this problem to other MOVs, diagnostic equipment inaccuracy, and inertia effects. The licensee provided an informal description of its evaluation of RHR 1E12F024A that had been performed in response to the MOV failure. The inspectors noted that this MWR might be an indication that the licensee's original assumptions regarding valve factors were low. In addition, the inspectors reviewed other MWRs that attributed the cause of MOV failures to be dirty torque switch contacts. The inspectors cautioned the licensee that an MOV that fails to close during dynamic testing may operate adequately during static tests that follow maintenance, even if the cause of the failure was not corrected. Therefore, the licensee should not assign a minor cause (such as dirty contacts) to an MOV failure unless such cause is thoroughly justified.

In Licensee Event Report (LER) 90-005 (April 23, 1990), the licensee identified MOV 1FC007 as undersized. In response to this

problem, the licensee reviewed the results of diagnostic tests for thrust output and current of all other safety-related MOVs. The licensee found several MOVs to be undersized and to require modifications. As part of the corrective action, the licensee relied on its efforts under its GL 89-10 program. The licensee stated in the LER that the design basis reviews would be complete by January 1, 1991. The NRC inspectors considered the licensee's response to the MOV problems identified in this LER to be weak and to be associated with the deviation from the licensee's commitments to GL 89-10. For example, the licensee noted in the LER that diagnostic testing in 1986 had indicated that, with the torque switch set at maximum for MOV 1FC007, the delivered thrust was only minimally above the calculated design minimum requirement. Diagnostic testing subsequent to the valve failure indicated that the actuator was not capable of providing the minimum required thrust to the valve. The licensee stated in the LER that the cause of the problem was its failure to consider MOV capability in establishing its diagnostic equipment criteria of 110% of design thrust. The inspectors, however, consider the cause to be a design control weakness such that MOVs were undersized to perform their design function. Further, the licensee is relying on its GL 89-10 program to resolve weaknesses in the original design process for its MOVs. This places increased emphasis on the need to complete the design basis reviews under GL 89-10 on a timely schedule.

The licensee provided the NRC inspectors with a listing of 15 MOV actuators which compared the dp originally specified by the engineering firm that designed the facility to the actuators maximum dp rating supplied by the manufacturer. Four of the actuators were found to be underrated. The licensee indicated that 2 of the actuators had design modifications which increased their capability above the original ratings. The diagnostic information for the other 2 underrated actuators indicated that adequate thrust from the actuator was available to close the valves under design basis conditions. The licensee indicated that the

design engineering firm often specified larger actuators than were actually required. The licensee agreed to compare the ratings of the remaining safety-related MOV actuators in a similar manner to ensure that they are capable of performing their safety functions.

The licensee trends MOV failures formally. However, the licensee does not formally trend MOV deficiencies. The licensee stated that parameters from the diagnostic equipment data are tracked by a plant engineer. The licensee stated that torque switch settings are recorded but not trended. The NRC inspectors considered the licensee's practices for trending of MOV failures and deficiencies to be deficient and not consistent with the recommendations of GL 82-10.

(7) Operating Experience and Vendor Notification

The NRC inspectors requested the licensee to provide evidence of its review of several Limitorque documents associated with Part 21 notices and maintenance updates. The licensee had copies of the documents, but did not have written evaluations. However, the licensee identified areas where plant procedures were revised to address vendor information. The system appears to work, but administrative controls are weak.

(8) Diagnostics

The licensee used Motor Operated Valve Analysis (MOVATS) 2150 diagnostic equipment. The licensee stated that it would continue to assume an inaccuracy of 10% in its determination of minimum thrust requirements until an ongoing test program by MOVATS was complete. The NRC inspectors advised the licensee that they will be expected to justify the use of any inaccuracy values different from the results of the tests performed by the MOV Users Group (MUG). The inspectors noted that the MUG is planning to release its final report in January 1992. By that time, the licensee should have completed any effort to establish the accuracy of its MOVATS equipment by means of an alternative test program to the MUG tests. The licensee

should also identify those MOVs which have been set using MOVATS equipment to be able to promptly evaluate their operability in light of the final results of the MUG tests or the licensee's alternative tests. The licensee is currently evaluating the need to upgrade this equipment.

(9) Walkdown

The NRC inspectors performed a walkdown to observe ongoing preventive maintenance on RCIC MOVs 1E51C002E and 1E51F031 as well as the general condition of other MOVs. The inspectors did not identify any significant concerns. However, the inspectors did note small amounts of dripping grease from RCIC 1E51F031 and SSW 1SX014A. The inspectors also noted white crystalline deposit around the stem of 1SX008A. The licensee should evaluate these findings. Although the inspectors did not identify any concerns regarding stem lubrication, the inspectors were not able to observe any MOVs in high temperature areas because of plant operations. The licensee should confirm the adequacy of stem lubrication on MOVs in high temperature areas consistent with plant operation schedules.

3. Licensee Self-Assessment (2515/109)

The NRC inspectors observed that past self-assessment activity has been limited and ineffective in the area of MOVs. An operational self-assessment program should have provided indications that the GL 89-10 program was significantly behind schedule, but there is no evidence that such an observation was made. However, documents which were generated by licensing and safety just prior to the inspection have demonstrated outstanding potential. The documents were provided to the inspectors immediately prior to the exit meeting and a review of those documents disclosed that most of the findings of the inspectors were anticipated by the licensee in that document. The potential benefits of the self-assessment process were underscored by the results of the inspection.

4. Licensee Documents Reviewed (2515/109)

- o Administrative Procedure (April 11, 1991), Preparation of Post Maintenance Testing, Revision 4.

- o Administrative Procedure (July 11, 1991), Station Preventive Maintenance, Revision 18.
- o Bounding Differential Calculations for Selected Feedwater System MOVs, IM-M-0004 (October 5, 1991).
- o Generic Letter 89-10 Program Presentation (October 7, 1991).
- o Generic Letter 89-10 Scope Document (October 3, 1991).
- o ITI-MOVATS Engineering Report ER-5.0 (Revision 1, July 12, 1991), ITI MOVATS Incorporated Equipment Accuracy Summary.
- o Letter (December 29, 1989) from licensee to NRC in response to GI 89-10.
- o Letter (December 13, 1990) from licensee to NRC on Supplement 3 to GL 89-10.
- o Letter (March 11, 1991) from licensee to NRC in response to Supplement 3 to GL 89-10.
- o Letter (April 4, 1991) from licensee to NRC in response to GL 89-10.
- o Letter (August 16, 1991) from Westinghouse Electric Corporation to licensee on MOVATS diagnostic equipment inaccuracy.
- o Letter (September 19, 1991) from licensee to NRC in response to Request of Additional Information related to Supplement 3 to GL 89-10.
- o Letter (September 20, 1991) from ITI MOVATS to licensee on equipment inaccuracy.
- o Letter (September 27, 1991) from ITI MOVATS to licensee on equipment inaccuracy.
- o Licensee Event Report 90-005 (Revision 0, April 23, 1990).
- o Maintenance Procedure 8451.01 (Revision 23, September 18, 1991), Preventive Maintenance for Motor Operated Valves.
- o Maintenance Procedure 8451.02 (Revision 20, September 23, 1991), MOV Signature Analysis.

- o Maintenance Procedure 8451.02C001 (Revision 17, September 23, 1991), MOVATS Test Checklist.
- o Maintenance Procedure 8451.03 (Revision 7, September 23, 1991), Baseline and Periodic Testing of Motor Operated Valves Using the MOVATS Motor Load Unit.
- o Maintenance Procedure 8451.04 (Revision 8, September 23, 1991), Limitorque Operator Removal/Installation.
- o Maintenance Procedure 8451.05 (Revision 6, September 23, 1991), Corrective Maintenance for Limitorque SMB-000, SMB-00 and SB-00 Operators.
- o Maintenance Procedure 8451.10 (Revision 0, September 17, 1991), MOV Trouble Shooting and Root Cause Matrix for Limitorque Operator and their Valves.
- o Maintenance Work Request (MWR) C58196 (November 9, 1988).
- o MWR D01164 (February 20, 1991).
- o MWR D04162 (July 16, 1990).
- o MWR D14387 (June 8, 1989).
- o MWR D16804 (March 10, 1991).
- o MWR D31468 (August 5, 1991).
- o Memorandum (September 16, 1988) from J. D. Lunston to File B45 on evaluation of failure of MOV 1E12F024B.
- o Motor Operated Valve Program Description and Responsibilities for CPS GL 89-10 Program (October 7, 1991).
- o Motor Operated Valve Program Schedule (Revision 1, September 27, 1991).
- o Motor Operated Valve Torque and Limit Switch Setting List (Revision 32, June 4, 1991).
- o MOVATS Test Data Sheet 461-022886-1E51-F063 (March 31, 1986).
- o MOV Terminal Voltage Calculations, 19-AQ-2 (December 21, 1984), Simultaneous Motor Starting During LOCA.

- o Nuclear Plant Reliability Data System - Failure Master Reports (October 9, 1991) for MOV failures 1B21F065B (12/18/90), 1E12F024B (8/14/91), 1FW002B (2/19/89), 1B33F067B (11/20/89), 1B21F098D (11/8/90), 1FW014 (11/7/90), 1FW002A (5/28/89), 1B33F067A (4/25/89), 1E12F024B (9/7/88).
- o Nuclear Station Engineering Standard ME-03.00 (September 22, 1991), General Guidelines for Performing Bouncing Valve Differential Pressure Analysis.
- o NSED Procedure R.0 (Revision 5, August 14, 1990), Equipment Failure Trending and Evaluation.
- o Positions on Technical Issues Related to GL 89-10 Design Basis Review (October 7, 1991).
- o Qualification Training Requirements Reference Nos. 336, Repair and Adjust Limitorque Actuators, 343, Adjust Limitorque Using MOVATS Equipment, and 344, Repair Limitorque Actuators (Revision 6).
- o RCIC and RWCU HELB Isolation Capability Evaluation (February 25, 1991).
- o Sargent & Lundy Standard Specifications for Alternating Current Motors Constant Speed, Squirrel-Cage Type.
- o Sargent & Lundy Standard Specifications for Motors and Operating Equipment Used on Valves.
- o Surveillance Procedure 9000.01 (September 20, 1991), Control Room Surveillance Log, Rev. 26
- o Training Guide JT52101 (September 4, 1990), Adjust Limitorque Actuators Using MOVATS.
- o Training Guide JT52102 (September 4, 1990), Repair Limitorque Actuators.
- o Training Guide JT52003 (April 30, 1990), Repair and Adjust Limitorque Actuators.
- o Training Guide LP52004-01 (December 21, 1989), Limitorque Actuators.
- o Updated Safety Analysis Report (Revision 2, September 1990), Section 8.3.1.1.2, Unit Class 1E A-C Power System.

5. Conclusions

The NRC inspectors found the licensee to be in deviation from its commitments to have an adequate program description on site at the time of the NRC inspection. The licensee has assigned a significant amount of resources to correct its deviation and to establish a program in response to GL 89-10 on an accelerated basis. The inspectors identified concerns regarding the performance of the licensee's design basis reviews, design basis testing, periodic verification, corrective action, trending, schedule, and response to Supplement 3 to GL 89-10. The licensee needs to make considerable progress in its efforts to address the MOV issue at the Clinton Station.

6. Deviations

A deviation is a licensee's failure to satisfy a written commitment, such as in a letter to the NRC, which has not been made a legally binding requirement by the commission. An example of a deviation disclosed during this inspection is shown in Paragraph 2.c. of this report.

7. Exit Meeting

The NRC inspectors met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 11, 1991. The inspectors summarized the purpose, scope and findings of the inspection. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.