

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-266/92021(DRS); No. 50-301/92021(DRS)

Docket Nos.: 50-266; 50-301 Licenses No. DPR-24; No. DPR-27

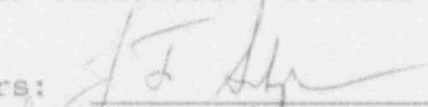
Licensee: Wisconsin Electric Power Company
231 West Michigan Street - P379
Milwaukee, WI 53201

Facility Name: Point Beach Nuclear Plant - Units 1 and 2

Inspection At: Two Rivers, Wisconsin

Inspection Conducted: October 5-16 & 22, 1992

Inspectors:

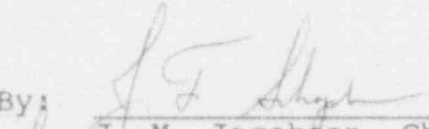

J. F. Smith

10/30/92
Date


M. P. Huber

10/30/92
Date

Approved By:


J. M. Jacobson, Chief
Materials & Processes Section

10/30/92
Date

Inspection Summary

Inspection conducted October 5 through 16 and 22, 1992 (Reports No. 50-266/92021(DRS); No. 50-301/92021(DRS))

Areas Inspected: Announced safety issues inspection of the licensee's response to Generic Letter (GL) 89-10, "Safety-Related MOV Testing and Surveillance," in accordance with the guidance of Temporary Instruction 2515/109.

Results: The licensee has developed a program which is generally consistent with the guidance of GL 89-10. The inspection disclosed one open item (Paragraph 3.) and two unresolved items (Paragraphs 3.c and 4.e).

The licensee demonstrated weaknesses in the following areas:

- ° The absence of Limitorque Maintenance Updates from vendor information files.
- ° Lack of documentation of the bases used to calculate the maximum dp at which the MOVs must operate.

- ° Incomplete technical training on use of diagnostic equipment and analysis of results.

The licensee demonstrated strengths in the following areas:

- ° The development of a unique MOV diagnostic system.
- ° The implementation of a proactive self-assessment program.

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DETAILS

1. Persons Contacted

Wisconsin Electric Power Company (WEPCo)

*G. Maxfield, Plant Manager
#*J. Becka, Manager, Regulatory Services
*S. Goukas, Nuclear Analysis
#S. Bacalzo, Nuclear Engineer
*T. Koehler, Manager, Maintenance and Engineering
*M. Kondelka, Regulatory Specialist
*J. Roberts, Mechanical System Engineering
#F. Flentje, Regulatory Services

U. S. Nuclear Regulatory Commission (NRC)

#K. Jury, Senior Resident Inspector
*J. Gadzala, Resident Inspector

*Denotes those personnel attending the site exit meeting on October 16, 1992.

#Denotes those personnel participating in the telephone exit meeting on October 22, 1992.

2. Licensee Action on Previous Inspection Findings (92701)

(Closed) Unresolved Item 50-266/92008-01; 50-301/92008-01:

This unresolved item was associated with the IST program:

- (a) Leak rate testing some Category A and A/C valves on a system rather than on an individual basis. Revised Relief Request VRR-23, submitted July 30, 1992, ensured that this matter would be properly resolved.
- (b) Classification of Pressure Isolation Valves. The licensee's letter dated July 31, 1992, committed to revise Section 3.8 of the IST program to resolve this anomaly.
- (c) Testing of containment sump recirculation valves. The licensee's letter dated July 31, 1992, committed to modify the IST program to incorporate requirements to test these valves in the both the open and the close directions.
- (d) Position indication testing on containment sump recirculation valves. The licensee's letter dated September 9, 1992, committed to incorporate the position indication test into the IST requirements for these valves.

This unresolved item is closed.

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

The NRC inspectors reviewed the commitments contained in the licensee's GL 89-10 response submitted December 15, 1989. The licensee took exception to the GL guidance to test MOVs under full differential pressure (dp) wherever practicable. Instead, the licensee proposed to group MOVs into families with similar characteristics and to test selected members of the family by full dp/full flow testing.

Industry tests have shown that apparently identical MOVs may behave differently under design basis conditions. Grouping of MOVs for the purpose of dp testing may not provide an acceptable level of confidence that untested MOVs could perform their safety functions under worst case conditions. The licensee agreed to provide technical justification for the grouping of MOVs. This was considered an open item pending NRC review of the technical justifications for grouping (Open Item 50-266/92021-01(DRS); 50-301/92021-01(DRS)).

a. Scope

The scope of the program appeared to be adequate with respect to inclusion of the necessary MOVs. The program included 122 safety related MOVs. A review of several selected safety systems indicated that the program included all appropriate MOVs.

b. Design Basis Reviews

(1) Differential Pressure Requirements

A detailed description of the documents and conditions to be considered for determining the maximum expected dps was not included in the procedure developed for performing design-basis reviews. The guidance developed by the licensee made no mention of the use of the FSAR, Technical Specifications, EOPs and mispositioning when determining the maximum expected dp. Internal reviews of the MOV program at Point Beach reported the same conclusions.

The GL recommends that the documentation of the design basis operation of MOVs include the maximum dp expected during both the opening and closing of the MOV for both normal operations and abnormal events within the approved design basis. Plans and procedures for performing design-basis reviews should provide guidance for performing the review.

The licensee committed to update the guidance for determining maximum dp and to develop thorough design basis review packages. The lack of detailed guidance in this area was considered a weakness.

(2) Reduced Voltage Capability

The licensee's methodology for performing degraded voltage calculations appeared to be non-conservative. Although the calculations were performed assuming the worst case grid voltage (for AC motors) and the minimum battery voltage (for DC motors) as the starting points, assumptions for cable voltage drops were non-conservative.

Cable resistances were based on an anticipated cable temperature of 26°C outside containment. This assumption may be non-conservative because cables may be exposed to higher temperatures during design-basis events. Additionally, the licensee assumed that the maximum current in the cables would be five times the normal running current for all MOV motors. The actual maximum current draw for a given motor is motor dependent and may be more or less than this value.

The use of these assumptions could yield incorrect results. Specifically, it might appear that an MOV should function under reduced voltage conditions, when it could not.

As a result of the concerns raised by the NRC inspectors, the licensee committed to revise and re-perform the degraded voltage calculations. In the revised calculations, the licensee indicated that cable temperatures used would reflect calculated design-basis event temperatures and that the maximum current would be based on a review of the motor curves. The revised methodology was reviewed and appeared to be acceptable.

c. MOV Switch Settings

The licensee evaluated the capability of the MOV to operate under design-basis conditions by calculating the available thrust using the standard Limitorque methodology. However, non-conservative assumptions were incorporated into the equation. One non-conservative assumption was the use of stall efficiency instead of pullout efficiency. Limitorque's intended

use of the stall efficiency, along with other conservative factors, was to calculate the maximum thrust which could be produced by the motor and inertia. In order to provide a conservative basis for evaluating the potential for causing damage to the MOV, stall efficiency yields a deliberately high estimate of motor capability. It was not intended to be used to demonstrate MOV capability.

Another non-conservative assumption was the use of an incorrect methodology for calculating the reduced voltage factor in the motor capability evaluation. For cases in which the voltage at the motor could dip to less than 90% of the rated motor voltage, the reduced voltage factor is calculated using rated motor voltage as the reference voltage. For example, if the voltage at the motor terminals was found to be 368 volts for a 460 volt AC motor, then the reduced voltage factor would be $(368/460)^2 = 0.64$. Using the licensee's method for determining the reduced voltage factor, it would be $\{368/ (.90 \times 460)\}^2 = 0.79$.

The licensee committed to remove the non-conservative assumptions from their calculations and re-perform the calculations. This was considered an unresolved item pending future NRC review of the licensee's revised methodology and completed calculations for determining degraded voltage conditions at the MOV and MOV switch settings (Unresolved Item 50-266/92021-02(DRS); 50-301/92021-02(DRS)).

The licensee was performing as-found design basis testing. The resulting test data was to be evaluated to ensure that the actual valve and stem factor values assumed in the calculations were correct. This approach appeared to be acceptable.

The margin to account for the rate-of-loading phenomena was not included in thrust calculations. Additional margin may need to be added to envelop this effect, when this information becomes available. The licensee was evaluating dp test results to determine the effects of the rate-of-loading phenomenon. Results of the reviews were to be incorporated into the licensee's Design Basis Documents.

d. Design Basis Differential Pressure and Flow Testing

The licensee planned to full dp/full flow test 102 of the 122 MOVs in the program. The remaining MOVs were grouped in "families" which the licensee considered either unnecessary to test because of similar

characteristics and applications or impracticable to test. The MOVs which were tested were selected as those with the greatest demands and the least capability of any in the group, so they were the MOVs with the minimum margins. As indicated in the introduction to this section, the licensee was responsible for justification of the grouping concept.

e. Periodic Verification of MOV Capability

The licensee's plan for periodic verification of MOV capability was to statically test them using the Point Beach diagnostic system. No additional full dp testing was planned. The licensee stated that the use of diagnostics to ensure that each MOV in the program was capable of performing its safety function would be justified. The licensee planned to prepare a report outlining the justification for applying static test results to periodic verification of MOV capability.

The five year period proposed by the licensee for testing was identified in the maintenance section of the program as a "valve operator checkout". This period is in accordance with the guidance of CL 89-10.

f. Schedule

The licensee planned to complete all testing and analysis within the schedule proposed by the GL. However, the licensee's schedule presumes that the plan to test selected MOVs to represent each MOV "family" will be justified.

The licensee tested 66 of the 102 MOVs which were planned to be tested. The remaining 32 were to be tested within one outage of Unit 1 and one outage of Unit 2. However, if the grouping into families could not be justified, testing of 20 additional MOVs would be necessary in this same period.

4. Associated Programmatic Reviews

The NRC inspectors reviewed other licensee programs associated with MOVs.

a. MOV Setpoint Control

The licensee's documents for control of switch settings contained several options which provided inadequate control of switch settings. The licensee indicated that these were emergency options which had never been exercised and committed to remove them from the

procedures. This resolved all questions concerning setpoint control for MOVs.

b. Maintenance

No problems were found with maintenance or with post maintenance testing. Scheduling of maintenance work was done through the CHAMPS computer system in accordance with the schedule identified in the MOV Callup Program.

All corrective maintenance activities were administratively coupled to Nuclear Plant Reliability Data System (NPRDS) and to the NPRDS Component Failure Analysis Report (CFAR).

c. Training

The licensee developed a program for training personnel in the use of the diagnostic system. The program appeared to appropriate and adequate for training personnel to operate the equipment. However, there was no schedule for training the engineers for whom the program was developed and there was no program to train personnel to analyze the results of the testing.

Classroom training represents only a small portion of the time required to develop personnel to a point at which they can operate MOV diagnostic equipment independently. Training plans did not reflect a realistic schedule for development of competent personnel in the area of MOV diagnostics.

The failure to provide adequate technical depth through training is considered to be a weakness.

Training of personnel for performing maintenance on MOVs was considered to be adequate.

d. Followup and Trending of MOV Maintenance and Problems

Followup and trending appeared to function in an acceptable manner and were not examined in depth. These functions were implemented through a combination of information formally recorded through the CHAMPS computer program, data for NPRDS, and oversight by the MOV coordinator.

e. Diagnostics

The MOV diagnostic system used at Point Beach was developed and patented by Point Beach personnel, one of whom was still responsible for the MOV program. The development of this system is considered a strength.

The licensee performed an evaluation of overall force measurement system accuracy which indicated a net system accuracy of $\pm 5.33\%$. However, this evaluation was based on calculation and did not confirm the predicted accuracy by empirical means.

When the inspectors indicated that a more direct evaluation of overall system efficiency was warranted, the licensee indicated that such testing may have already been performed and that a comparison of predicted vs. observed thrust values would be provided to confirm the overall system accuracy. The lack of a confirmed overall system accuracy was considered an Unresolved Item (50-266/92021-03(DRS); 50-302/92021-03(DRS)).

f. Operating Experience and Vendor Notification

The licensee received no Limitorque technical or maintenance updates because they were not included on Limitorque's list of industrial users. As a result there were no Limitorque Updates in the file.

The licensee took prompt action to procure and review previous updates, to determine the root cause of the omission from Limitorque's list, to ensure that it had not occurred with other vendors and to prevent a recurrence.

The licensee's program for control of operating experience and vendor notification documents was acceptable and there were no other indications of discrepancies in its implementation. However, the failure to recognize the absence of important vendor documents identified in MOV technical literature and at MOV conferences is considered a weakness.

5. Licensee Self-Assessment

The licensee performed an evaluation of the MOV program implemented in response to the GL. The evaluation was thorough, objective, and generally effective. The licensee also evaluated the program with respect to Information Notice 92-17, in which issues raised in recent NRC inspections were addressed. This extended the areas in

which improvements could be made in the program. The licensee's initiative in extending the self-assessment program to cover the results of inspections at other plants was considered a strength.

6. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during this inspection is discussed in Paragraph 3.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during this inspection are discussed in Paragraphs 3.c. and 4.e. of this report.

8. Exit Meeting

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 16, 1992. An additional telephone exit was held on October 22, 1992. The inspectors summarized the purpose and scope of the inspection and the findings. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary.