

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-266/90025(DRS); No. 50-301/90025(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: Point Beach Site, Two Rivers, WI 54241

Inspection Conducted: November 26-30, 1990

Inspectors: D. H. Danielson
for M. P. Huber

12/12/90
Date

D. H. Danielson
for J. F. Smith

12/12/90
Date

Approved By: D. H. Danielson
D. H. Danielson, Chief
Materials and Processes Section

12/12/90
Date

Inspection Summary

Inspection during November 26 through 30, 1990 (Reports No. 50-266/90025(DRS); No. 50-301/90025(DRS))

Areas Inspected: Routine announced safety inspection of maintenance and inservice testing (IST) of pumps and valves. The areas covered included implementation of IST (73756), including a review of administrative procedures, performance of testing, recording of trends, scheduling of testing, and training; and actions taken to address NRC Bulletin 88-04, "Potential Safety-Related Pump Loss" (255105).

Results: No violations or deviations were identified. Based on the results of the inspection, the NRC inspectors noted the following:

- ° Operational tests of the Safety Injection (SI), Residual Heat Removal (RHR) and Auxiliary Feedwater (AFW) Systems at design flow conditions for three different points of the pump's characteristic curves was considered a strength.
- ° Attention to detail was lacking in the licensee's actions taken to address programmatic problems relating to the IST program.

DETAILS

1. Persons Contacted

Wisconsin Electric Power Company (WEPCo)

*J. Reisenbuechler, Superintendent, Operations
*T. Staskal, Operations Engineer
*J. Polachek, Quality Assurance Engineer
*J. W. Jack, Quality Specialist, Regulatory Services
L. Kamyszek, Operations Engineer
J. VanDenBosch, Operations
R. Seizert, Regulatory Services

U. S. Nuclear Regulatory Commission (NRC)

*C. Vanderniet, Senior Resident Inspector

*Denotes those persons attending the exit interview on November 30, 1990.

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

2. Licensee Action on NRC Bulletins (255105)

(Closed) TI 2515/105 - NRC Bulletin 88-04: Potential Safety-Related Pump Loss

NRC Bulletin 88-04 identified concerns related to (1) the potential for deadheading of one or more pumps in safety-related systems that have a miniflow line common to two or more pumps or other piping configurations that do not preclude pump-to-pump interaction, and (2) whether or not the installed miniflow capacity is adequate for even a single pump in operation. Licensee's were required to investigate and correct the two concerns listed above and correct them where applicable.

The NRC inspector reviewed the licensee's actions to address NRC Bulletin 88-04 to verify implementation of the identified areas of the NRC Bulletin. Documentation of the results of the review of systems to determine applicability, a review of the evaluations of the systems identified as having the questionable configuration, vendor correspondence, test results, special operating orders and other documentation were reviewed during the inspection.

Point Beach Nuclear Plant (PBNP) evaluated the bulletin and the applicability at PBNP and determined that the Residual Heat Removal (RHR), Safety Injection (SI), and the Auxiliary Feedwater (AFW) Systems were affected by Bulletin 88-04.

The licensee submitted to the NRC their plans to address Bulletin 88-04 which included a description of the problems associated with the specific system and the proposed resolutions.

The licensee implemented Operations Special Order PBNP 88-03 to provide operators information about the necessity to limit the amount of time that pumps were run on recirculation and to preplan in order to minimize the time taken to perform testing. However, the NRC inspector noted that the Special Order reflected the vendor recommended run time limits for the RHR and SI pumps, but not for the AFW pumps. The licensee initiated a Nonconformance Report (NCR) to revise PBNP 88-03 to include AFW pumps and their corresponding vendor recommendations for run time limits during miniflow operation.

Modifications to the affected systems are planned for the affected systems, which would allow for testing to be performed at or near full flow conditions. The containment spray system will also be modified to allow testing at or near full flow, although this system was not included in the response to Bulletin 88-04. Discussions with the licensee confirmed that the modifications were currently in the planning stages for implementation as scheduled in their response to NRC.

No modifications were planned for the current miniflow line configurations. The miniflow conditions would still be seen by the pumps during accident conditions when the pumps were operating. The NRC inspector reviewed additional information in order to evaluate the licensee's conclusion that operation in miniflow during an accident condition was not a concern.

Since surveillance testing is conducted to detect deficiencies and provide data for trends, the NRC inspector reviewed trends of differential pressure and vibration data over a 1½ year period evaluated by the licensee. No adverse trends in pump performance due to miniflow operations were noted. The NRC inspector consulted with cognizant NRC Headquarters personnel and it was determined that the licensee's practice was acceptable.

Because the licensee has taken action to address the potential of safety-related pump damage during miniflow operation and acceptable progress is being made toward resolution of the concerns identified in Bulletin 88-04, the bulletin was considered closed.

3. Pu: and Valve Inservice Testing (IST) Program Implementation (73756)

- a. The licensee's IST program is not administered by a formal document which assigns specific responsibilities to persons or organizations for its implementation. Responsibility is distributed among a substantial number of individuals in the operations group. The Operations Engineer has major responsibility for coordinating the efforts of the group.

Procedures for IST of pumps and valves are written by the operations personnel responsible for the system involved in the testing. There are no special written requirements for procedures dealing with IST.

The procedures are written in cooperation with the operations engineer, but there appears to be no mandatory review by other groups, such as engineering. The guidance for testing to be performed is taken from the Point Beach Nuclear Plant Operations Standing Orders, Inservice Testing, Section PBNP 4.12.17 and the MOV/AOV Operation and Maintenance Guidelines, Section PBNP 4.12.14.

The scheduling of inservice tests for pumps and valves is included in the Computerized History and Maintenance Planning System (CHAMPS). This system periodically issues "Callups" for work to be done during the coming week and this callup includes inservice tests. The callup includes identification of the pump or valve, the date scheduled for the test, and the identification of the test procedure.

When an inservice test is identified on the CHAMPS callup sheet, the operations Duty Shift Superintendent (DSS) assigns an operator to perform the test, using a procedure which is on file. The DSS coordinates the performance of the test between the control room and the field. The acceptance criteria for each test are deliberately withheld from the procedure in order to avoid providing a preconceived notion of what the test results will be. At the completion of each test, the operator and the DSS determine operability of the equipment by comparing the test data with the acceptance criteria in the Standing Orders. The Standing Orders properly require declaring the equipment inoperable if the test parameters enter into the Required Action Range, even though the test instrument calibration is subsequently found to be out of calibration. No action is required at this time if the test parameters enter the Alert Range.

After the DSS has signed the operability determination and the test is completed, the results are then transmitted to operations support personnel who review it to determine if the test results are in the Alert Range. If so, that individual initiates a document to increase the inspection frequency called for in CHAMPS. He then prepares the test data for entry into CHAMPS.

Trending is not performed automatically on each piece of data from equipment tested in the IST program. In fact, no trending is performed on any piece of equipment until it enters into the Alert Range. Then the data stored in CHAMPS is assembled and plotted in the form of a trending curve. Based on the information presented by the trending curve and other data available from prior maintenance, a decision is made concerning the advisability of corrective action.

b. Training of Inservice Testing Personnel

There is no special training provided for IST personnel. The licensee is apparently convinced that the training provided to the operators, combined with their experience, is ample to provide them with the knowledge necessary to perform simple operational tests on pumps and valves. In addition to operating the equipment, the operators also are the authors of the test procedures.

The NRC inspectors reviewed the training outlines used in training operators and found little information devoted exclusively to IST. It is impossible to say that full coverage of pumps and valves was not provided because only an outline was reviewed. However, several items critical to understanding IST were conspicuous by their absence from the outline. These included:

- ° effect of changing limit switch positions on stroke timing;
- ° sources of stroke timing error;
- ° effect of limit switch position on closure of throttling valves;
- ° deadheading and parallel flow of pumps on miniflow; and
- ° symptoms of deterioration or failure in MOVs, pumps and check valves.

In examining the cutaway MOV operators used for training, it was noted that the operators had no motors or valves attached. The operation of the motor could be satisfactorily demonstrated by the stem and crank, but operation of the torque switch was impossible to demonstrate because the valve operator had no stem on which to exert force.

As previously indicated, there was no training specifically intended for use by IST personnel. The operators may have derived sufficient IST information from previous experience and training, but it is unlikely that it would have been acquired through the training normally provided for operators at this plant.

c. Measuring and Test Equipment used with IST

There are no special requirements for Measuring and Test Equipment (M&TE) used on the IST program. Instruments which are read directly at the measuring site are calibrated periodically and identified by stickers showing the date due for the next calibration. Stop watches are the exception. Stop watches are issued to the control room and are not provided with a sticker. They are periodically recalibrated in accordance with CHAMPS callups, and if they are out of calibration, all tests on which the stop watch was used since the last calibration are reviewed. If any test data for pumps or valves would be shifted into an Alert or Required Action Range by the error found in the instrument, the appropriate action would be taken. This appears to be less conservative than the more conventional method of checking stop watch calibration before each job, even though the period between calibrations is the same. The checking of a calibration sticker would provide additional assurance that this instrument is used within its calibration period.

d. Review of IST Related Documents

The inspectors reviewed a number of licensee documents for compliance with the requirements of Generic Letter 89-04 and the Inservice Testing program. These documents are listed below, along with pertinent comments, where applicable.

- ° Point Beach Nuclear Plant Inservice Testing Program, dated March 17, 1990.

The inservice testing program was reviewed previously as one of the documents to which the licensee's implementation of IST must comply. The program is not normally reviewed for inconsistencies with the ASME Boiler and Pressure Vessel Code, Section XI and Generic Letter (GL) 89-04, but inasmuch as apparent inconsistencies appeared in the "interpretations" section of the program, early comments seem appropriate.

Paragraph 1.4.2 indicates that 10 CFR 50.55a(g)(1) limits IST of pumps and valves to those that are safety-related and indicates that this applies to PBNP Units 1 and 2. This is in direct conflict with Position 11, Attachment 1, Generic Letter 89-04, which states, in part, ". . . while 10 CFR 50.55a delineates the testing requirements for ASME Code Class 1, 2, and 3 pumps and valves, the testing of pumps and valves is not limited to those covered by 10 CFR 50.55a."

Paragraph 1.4.2 states that, "Modifications to the plant, to accommodate changes in inservice testing requirements in later editions of the Code are not specifically required." While this appears to be an acceptable premise, its validity may hinge on the licensee's interpretation of what constitutes a "change in IST requirements in later editions of the Code." For example, Position 9, Attachment 1 of Generic Letter 89-04 states, ". . . where only the minimum flow return line is available for pump testing, . . . the staff's position is that flow instrumentation which meets the requirements of IWP-4110 and 4120 must be installed in the miniflow line." If the licensee were to contend that the requirements of Generic Letter 89-04 are not applicable because the applicable Code edition is 1977, with Summer 1979 Addenda, then this interpretation would conflict with Generic Letter 89-04 (Paragraph 1.4.4 states, ". . . Generic Letter 89-04 . . . has provided . . . modification of ASME XI).

- ° Point Beach Nuclear Plant Operations Standing Orders, Inservice Testing, PBNP 4.12.17 NNSR, Revision 18, dated August 7, 1990.

This document provides the administrative and technical guidance necessary for implementation of the licensee's IST program. It also includes the acceptance criteria for determining operability of pumps and valves. The NRC inspectors reviewed the document for compatibility with the licensee's IST program and Generic Letter 89-04 and found several apparent anomalies.

While the stroke time of several randomly selected valves was consistent between the program and the standing orders, changes were confirmed to have been made in standing orders which reflected changes made in the the amendment dated July 31, 1990 to Appendix E of the IST program. These changes were made to correct discrepancies in which IST stroke times exceed SAR allowable stroke time.

In another area, the types of IST tests prescribed in the IST program were compared with those identified in the Standing Orders. One test, the Fail Safe Test (FST) was described in Paragraphs 1.2.19 and 1.b of the IST program and all of Appendix C was dedicated to it. However, there was no mention of such a test in the Standing Orders. After some discussion, the licensee concurred with the NRC inspectors that the testing done on air operated valves was not identified as fulfilling the requirements for FST. The licensee committed to adding clarification to the Standing Orders to confirm that the FST was performed during IST without being identified as FST and describing how the routine IST fulfilled the requirements for FST.

- ° Point Beach Nuclear Plant Operations Standing Orders, MOV/AOV Operation and Maintenance Guidelines, PBNP 4.12.14, NNSR, Revision 7, dated March 9, 1990.

Paragraph 3.1.1 states, "Safety-related valves . . . must have a post maintenance test performed (valve cycled) . . .". This improperly infers that cycling a valve constitutes a post maintenance test. This might have the effect of convincing an operator that the test " . . . in accordance with ASME Section XI" referred to in Paragraph 3.1.2 is a valve cycling test.

- ° IST of Containment Spray Valve - Unit 1, IT-50, Revision 5, dated October 12, 1989, Test Date October 2, 1990; and
- ° IST of Containment Isolation Valves - Unit 1, IT-60, Revision 14, February 28, 1990, Test Date October 2, 1990.

An improper sign-off of the operation in which test data are evaluated to determine operability was noted. (Details are available in a subsequent section citing this violation.)

- ° IST of Service Water Valves, Revision 1, dated October 6, 1990, Test Date October 30, 1990.
- ° Service Water Pumps and Valves (Quarterly), IT-07, Revision 15, dated August 21, 1990, Test Date November 29, 1990.
- ° Flow Test of Safety Injection Pumps (Refueling) - Unit 1, ORT-1, Revision 15, dated August 23, 1990.
- ° Auxiliary Feedwater System Check Valves and Flow Indicators - Unit 1, IT-290, Revision 22, dated October 4, 1990.

- Flow test of RHR Pumps - Unit 1, ORT 2, Revision 13, dated August 23, 1990.

e. Determinations of Valve Operability

The IST of Containment Isolation Valves - Unit 1, in Test Procedure IT-60, initiated on February 28, 1990, contained an improper sign-off. The operation was the comparison of test parameters with the acceptance criteria tabulated in the Standing Orders. Failure of test parameters to meet acceptance criteria would result in declaring the source equipment inoperable. The individual required by procedure to sign for this operation is the Duty Shift Superintendent (DSS). Instead, this operation was signed by the individual responsible for the next action. That individual also signed the next operation and dated it. The date was two days after the test was run. As such, the documentation does not support a timely determination of valve operability. If the valve data had been reviewed and not signed by oversight, it still should not have been signed by anyone other than the DSS.

This matter was discussed with the licensee and it was noted that the procedure on which the deficiency was observed was an earlier revision. Procedures for other valves and pumps were reviewed and found to be written in a manner which would virtually preclude the occurrence of the problem. In these procedures, the valves are evaluated immediately after they become available and are signed off at that time, rather than awaiting completion of the entire group. The licensee also immediately discussed the matter with the personnel involved and they recognized the impropriety of their actions. The NRC inspectors agree that the appropriate corrective actions have either been accomplished or were already in progress. This violation is closed and no new responses are required.

f. Pump and Valve Testing Program

Testing of pumps and valves at PBNP was conducted through implementation of IT and ORT surveillance procedures with guidance provided by Operations Standing Order PBNP 4.12.17. This order provides guidance on the conduct of tests, evaluations of test data, documentation of tests, analyses, and limiting values for tests (acceptance criteria). Generally, the procedures were clear and testing was accomplished in accordance with the Code and the licensee's program requirements. The NRC inspector's reviewed completed procedures for various pumps and valves in the program. The data met the acceptance criteria and data evaluations were usually performed within allowable time limits.

(1) Duration of Tests for AFW, RHR, and SI Pumps:

In order to allow for pump data to be taken in a consistent manner, pumps shall be run at least five minutes under conditions as stable as the system permits prior to recording the quantities specified. The licensee accomplished quarterly testing in an acceptable manner; however, for pump testing performed during refueling outages on the AFW, SI and RHR pumps, the licensee performed full flow testing in a manner consistent with their IST program but without a five minute run time requirement prior to recording the specified data. During this type of testing on these pumps, five minute run times were not achievable due to the testing and system configuration.

The tests performed were generally considered better than the monthly testing to evaluate a pump's condition. The monthly flow testing was done at low flow conditions whereas the full flow testing was achieved at design system flow by varying the system resistance to obtain flow and developed pump head (pressure) data at three points along the pump curve. These values were compared to the pump curve and evaluated for degradation. System modifications were in progress to allow full flow testing on a quarterly schedule. The use of full flow tests to evaluate pump degradation was seen as a strength.

The NRC inspector noted that the licensee was not meeting their program requirements or the Code in two areas. These areas were the duration of the tests and the comparison of test data to the applicable reference values. During the performance of IST for the RHR, SI, and AFW pumps, where testing was done under full flow conditions, no controls were established to allow run times of at least five minutes prior to collecting the data specified, as required by the Code. The licensee had not requested relief from this requirement.

The system configuration for the full-flow testing was such that five minute run times would cause too much water be pumped. For example, since the full flow testing of the motor driven AFW pumps was performed during cold shutdown, a full flow run of the AFW pumps would fill the steam generators rapidly because there would be no steam flow.

ORT 2, Revision 13, "Flow Test of RHR Pumps" was an operational test of the low head safety injection pumps at design flow conditions. The procedure was designed to operate the pump at three different flow rates and record the quantities specified at each flow rate in order to evaluate the pump condition. The data from the three flow conditions was plotted to create a pump curve and the evaluation was performed by a comparison of the experimental pump curve and the vendor supplied pump curve.

The procedure has a step that requires the pump operability to be checked by a comparison of the pump data with the limits specified in the Operations Standing Order. This is also how the licensee has indicated the alternate testing would be performed, as stated in their program relief requests. Also, the Operations Standing Order allowed a range for the flow rate acceptance criteria for one of the data points.

When data was evaluated, it was done in accordance with the procedure; however, the ranges on the flow rate should not be used. The Code requires a fixed resistance be established to its reference value, and then the other parameters measured and compared to the established allowable ranges to determine acceptability.

Although the licensee's method of testing using the full flow test and comparing the experimental and vendor curves is generally considered to be better, the licensee's program needs to reflect the actual test and not an inadequate test. The licensee agreed with the NRC inspector's concern and implemented corrections to the program to update and clarify how the testing and evaluations would be done.

(2) Test Observation

The NRC inspectors observed selected portions of IT-07, "Service Water Pumps and Valves (Quarterly)." This test was a post maintenance operability test for pump P32F. The operations personnel performing the test were proficient in their tasks and completed the test in an efficient manner. Test data was recorded for the required testing quantities and evaluated promptly for operability. No problems were noted.

4. Summary

The licensee performs the inservice testing of pumps and valves with a minimum of personnel and procedures. There is no IST organization. Not a single position is dedicated exclusively to IST and administrative guidance in IST is considered unnecessary. In spite of these apparent handicaps, the portion of the program sampled on this inspection disclosed no major deficiencies nor undue delays in IST.

The implementation of IST is performed almost exclusively by operations personnel, in addition to their other duties. While some interaction with maintenance was evident, there appears to be considerably less contact with QA, QC, and engineering. If this observation is valid, it should seriously detract from the effectiveness of the program. No such effects have been observed to date.

The licensee is apparently accomplishing his IST objectives with a minimum dedication of personnel.

5. Exit Meeting

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on November 30, 1990, to discuss the scope and findings of the inspection. In addition, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents or processes as proprietary.