



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION
WISCONSIN ELECTRIC POWER COMPANY
POINT BEACH NUCLEAR PLANT UNITS 1 AND 2
DOCKET NOS. 50-266 AND 50-301
REACTOR TRIP SYSTEM RELIABILITY
ITEMS 4.2.1 AND 4.2.2 OF GENERIC LETTER 83-28

1. INTRODUCTION

On July 8, 1983, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 83-28. This letter addressed intermediate-term actions to be taken by licensees and applicants aimed at assuring that a comprehensive program of preventive maintenance and surveillance testing is implemented for the reactor trip breakers (RTBs) in pressurized water reactors. In particular, Item 4.2 of the letter required the licensees and applicants to submit a description of their preventive maintenance and surveillance program to ensure reliable reactor trip breaker operation. The description of the submitted program was to include the following:

- GL, Item 4.2.1 A planned program of periodic maintenance, including lubrication, housekeeping, and other items recommended by the equipment supplier.
- GL, Item 4.2.2 Trending of parameters affecting operation and measured during testing to forecast degradation of operation.

Wisconsin Electric Power Company, the licensee for Point Beach Nuclear Plant, Unit Nos. 1 and 2, submitted responses to the Generic Letter on November 7, 1983 and December 28, 1984. This report presents an evaluation of the adequacy of those responses and of the licensee's preventive maintenance and surveillance programs for RTBs.

2. EVALUATION CRITERIA

2.1 Periodic Maintenance Program

The primary source for periodic maintenance program criteria is Westinghouse Maintenance Program for DB-50 Reactor Trip Switchgear, Rev. 0. This document is the breaker manufacturer's recommended maintenance program for the DB-50 breaker and provides specific direction with regard to schedule, inspection and testing, cleaning, lubrication, corrective maintenance and record keeping. The document was reviewed to identify those items that contribute to breaker trip reliability consistent with the generic letter. Those items identified for maintenance at six month intervals that should be included in the licensee's RTB maintenance program are:

1. Verification of trip bar freedom
2. Verification of operating mechanism alignment and freedom
3. Retaining ring verification

4. Verification of nut and bolt tightness
5. Verification of pole bases physical condition -
6. Verification of arcing and main contacts physical condition
7. Verification of insulating link's physical condition
8. Verification of wiring insulation and termination physical condition
9. Verification of arc chute physical condition
10. Verification of breaker cleanliness
11. Undervoltage Trip Attachment (UVTA) dropout voltage test and lubrication
12. Shunt Trip Attachment (STA) operation verification
13. Verification of operation of auxiliary switches
14. Inspection of positioning lever condition
15. Functional test of the breaker prior to returning it to service.

The licensee's RTB periodic maintenance should also include, on a refueling interval basis:

16. Verification of cell interlock operation
17. Examination and cleaning of breaker enclosure
18. Measurement of trip force required
19. Functional test of the breaker prior to returning it to service
20. Breaker response time for undervoltage trip.

All of the items listed above are recommended by the manufacturer except Item 20. This is the breaker trip response time measurement which is implied by the IEEE Standard 279-1971.

2.2 Trending of Parameters

Generic Letter Item 4.2.2 specifies that the licensee's preventative maintenance and surveillance program is to include trending of parameters affecting operation and measured during testing to forecast degradation of operation. The parameters measured during the maintenance program described above which are applicable for trending are undervoltage trip attachment dropout voltage, trip force, and breaker response time for undervoltage trip. The staff position is that the above three parameters in addition to the breaker insulation resistance are acceptable and recommended trending parameters to forecast breaker operation degradation or failure. If subsequent experience indicates that any of these parameters is not useful as a tool to anticipate failures or degradation, the licensee may, with justification and NRC approval, elect to remove that parameter from those to be tracked.

3. EVALUATION

3.1 Evaluation of the Licensee Position on Item 4.2.1

In the licensee's December 28, 1984 response to the staff's request for additional information (RAI), the licensee states that his existing periodic maintenance program includes all the maintenance items at the

specified intervals listed, except the cell interlock operation. Revision 2 of the licensee's Routine Maintenance Procedure (RMP26) will include this item. The licensee also states that the performance of all items of RMP 26 is on a refueling interval basis and that his experience with the reactor trip and bypass breakers has demonstrated that these devices are very reliable. Moreover, the number of breaker cycles is not expected to exceed 40 during the interval of operation between refueling outages.

The Westinghouse Maintenance Program for DB-50 Reactor Trip Switchgear, Revision 0, states that "the semi-annual activities might be extended to 9 to 12 months if experience shows this to be sufficient provided that 200 breaker cycles are not exceeded during this interval."

Based on the above statements, the staff finds that the licensee's position on the scope and frequency of RTB maintenance is acceptable provided that the interval does not exceed 12 months.

3.2 Evaluation of the Licensee Position on Item 4.2.2

The licensee indicates that the undervoltage trip attachment dropout voltage is trended as recommended by Westinghouse. However, trip force, breaker response time for undervoltage trip, and breaker insulation resistance are not trended. Trip force and breaker response time for undervoltage trip are recorded and compared by the licensee to the maximum acceptable values of 31 ounces and 10 cycles, respectively.

The licensee justifies not trending the trip force and breaker response time for undervoltage trip by stating that he records these values and compares them to the maximum acceptable values of 31 ounces and 10 cycles, respectively. If the recorded values are significantly in excess of those normally experienced and recorded, the licensee's procedures call for corrective action. The values for breaker trip force and breaker response time at which the licensee has indicated corrective action would be performed are well below the maximum acceptable values and provide assurance that these values would not be exceeded. In addition, the licensee justifies not trending the breaker insulation resistance by stating that the breakers are cleaned, inspected for insulation cracks, and operated at less than one-half of rated voltage.

The staff position is that trending the four parameters with respect to time can provide useful information to forecast the degradation of operability of the breaker.

The licensee does not trend the trip force and the response time. However, the licensee does measure and record these parameters, which is acceptable to the staff. Although it would be better if these parameters were trended, the licensee's program is acceptable, and provides assurance that corrective action will be taken when the measured values approach the manufacturer's recommended maximum values.

With regard to trending the breaker insulation resistance, the licensee's position of neither measuring nor trending is acceptable because the breakers are operated at less than one-half of the rated voltage and are routinely inspected for insulation cracks and other signs of insulation deterioration.

4. CONCLUSIONS

Based on the review of the licensee responses, the staff accepts the licensee position on Items 4.2.1 and 4.2.2 of the generic letter, provided:

1. The licensee continues to record the trip force and the response time values, comparing them with the manufacturer's recommendations and taking corrective action if unusually higher than normal values are observed; and
2. The maintenance interval does not exceed 12 months.

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