

SAFETY EVALUATION BY
THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO OPERATION OF
ZION NUCLEAR POWER STATION UNIT NOS. 1 AND 2
COMMONWEALTH EDISON COMPANY
DOCKET NOS. 50-295 AND 50-304
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.

Commonwealth Edison, the licensee for Zion 1 and 2, submitted responses to the Generic Letter on November 5, 1983, February 29, 1984, and March 11, 1985. This report presents an evaluation of the adequacy of those responses and of the licensee's preventive maintenance and surveillance programs for RTBs.

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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 item 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

The licensee states that his preventative maintenance program for RTB's is being revised and by September 1, 1985, will contain all the elements detailed in Section 2.1 of this SER; however, the licensee

performs maintenance on the breakers at refueling intervals. The licensee states that the extended interval is justified based on the maintenance history of the breakers and the Zion estimate of 50 breaker actuations per fuel cycle. The staff finds the licensee position on Item 4.2.1 to be acceptable.

3.2 Evaluation of the Licensee's Position on Item 4.2.2

The licensee has committed to performance of trend analysis of trip force, breaker response time, undervoltage trip dropout voltage and insulation resistance. The licensee has identified the organization which will perform trend analysis, how often it will be performed and how the information derived from the analysis will be used to affect periodic maintenance. The staff finds the licensee position on Item 4.2.2 to be acceptable.

4. CONCLUSIONS

Based on a review of the licensee responses, the staff finds the licensee positions on Items 4.2.1 and 4.2.2 of Generic Letter 83-28 to be acceptable.

Principal Contributor:

N. Romney