

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATING TO REACTOR TRIP SYSTEM RELIABILITY ITEMS 4.2.3 AND 4.2.4 OF GENERIC LETTER 83-28 OMAHA PUBLIC POWER DISTRICT FORT CALHOUN STATION, UNIT 1 DOCKET NO. 50-285

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 4.2.3 Life testing of the breakers (including the trip attachments) on an acceptable sample size.
- GL, Item 4.2.4 Periodic replacement of breakers or components consistent with demonstrated life cycles.

The Omaha Public Power District, the licensee for Ft. Calhoun Unit 1. submitted a response to the Generic Letter on November 4, 1983. This report presents an evaluation of the adequacy of that response and of the licensee's life testing and periodic replacement programs for RTBs.

2. EVALUATION CRITERIA

2.1 Life Testing Program

The requirement for life testing of the RTBs is specified by Item 4.2.3 of the Generic Letter. The purpose of the life testing is to identify a qualified life for the RTB or any of its replaceable components as required by 10 CFR 50.55a(h). By definition qualified life is the period of time for which satisfactory performance can be demonstrated for a specific set of service conditions. The qualification methods that can be used to determine the qualified life, including the effects of aging, are identified in IEEE Standard 323-1974. IEEE Standard 323-1974 provides guidance on aging based on an awareness that the ability of Class IE equipment to perform its safety function may be affected by changes due to natural, operational, and environmental phenomena over time. The concept of aging was addressed explicitly for the first time in IEEE Standard 323-1974. The aging guidance therein reflects the requirement of IEEE Standard 279, which is the Standard specifically mentioned in 10 CFR 50.55a(h). Conformance with IEEE Standard 323-1974 is a method, acceptable to the staff, of meeting the requirements of 10 CFR 50.55a(h).

If it can be demonstrated that the qualified life exceeds the life of the Generating Station, then the specific qualified life need not be identified. In a practical sense the intent of the life testing requirement of the generic letter would be satisfied by demonstrating that the qualified life of the breaker (for the tripping function) exceeds the expected use projected to the next refueling. Cycle testing by the various Owners Groups, although it does not consider the effects of aging, may provide evidence to support continued use of the RTBs for one additional refueling cycle, provided that the individual breaker has not shown any sign of degradation in the licensee's Parametric Trend Monitoring Program. In this approach the actual qualified life is not specifically identified but only demonstrated to be adequate.

2

On-going life testing, as described in IEEE Standard 323-1974, is an acceptable alternative to formal life testing for the purpose of establishing a specific qualified life for the RTBs. On-going life testing will demonstrate that the qualified life, though not specifically known, is longer (in terms of cycles and time) than the integrated service that will be accumulated through the next refueling interval. The description of an on-going qualification program should include the following:

- Definition of the number of demands per unit of time, to which an RTB must respond, and the basis for the number of demands;
- Definition of relevant, end-of-life-related failures. (Note that random failures occurring during the constant hazard rate portion of the "bathtub curve" are not relevant to a life test); and
- 3. Definition of the action to be taken upon any failure.

2.2 Periodic Replacement Program

If the qualified life of any component is less than the qualified life of the RTB, then the component should be replaced on an appropriately shorter time schedule. The criteria developed in support of this item include record keeping for service time and number of cycles for all breakers and short-lived devices or components.

3. EVALUATION

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3.1 Evaluation of the Licensee Position on Items 4.2.3 and 4.2.4

The licensee has taken the position that because the Reactor Protection System design for Fort Calhoun is substantially different from that of other pressurized water reactors and because Ft. Calhoun uses contactors in the Reactor Trip System, rather than breakers, Items 4.2.3 and 4.2.4 are not applicable to Fort Calhoun. The staff concurs and considers these Items closed for this plant.

3

4. CONCLUSIONS

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Based on a review of the licensee response, the staff finds the licensee position on Item 4.2.3 and 4.2.4 of Generic Letter 83-28 to be acceptable.

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