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Director
Office of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282   License Nos. DPR-42
         50-306   DPR-60

Trending of Reactor Trip Breaker Parameters

In our letter dated January 4, 1985, we committed to provide a response to the reactor trip breaker parameter trending recommendations specified by item 4.2.2 of Generic Letter 83-28, following receipt of the Westinghouse Owners Group report on reactor trip breaker life cycle testing. This letter is provided in response to that commitment.

Item 4.2.2 of Generic Letter 83-28 proposed that a variety of parameters involving the reactor trip breakers and their internal components be trended. We now believe that such trending would not be useful, and therefore should not be required. This opinion is based on the operating history of the DB-50 breakers at Prairie Island Plant, and on the data gathered by Westinghouse in the life cycle testing of the DB-50 Reactor Trip Breaker Shunt and Undervoltage Trip Attachments (UVTA). The three parameters recommended by Item 4.2.2 which are applicable to DB-50 breakers are discussed below.

1. <u>UVTA Dropout Voltage</u> - Our current maintenance procedure takes as found/as left data, with a stipulation to notify the Maintenance Supervisor if the trip voltage deviates by more than 5 V from the value on the relay card. Upon completion, this procedure and test data is reviewed by the assigned system engineer and maintained as a plant record. This is done on a refueling outage interval, so that typically there would be much less than 100 breaker operations between tests.

In Westinghouse tests, UVTA devices (tested 2500 operations each) showed no upward or downward trends in UVTA Dropout voltage. During the course of the testing, breakers maintenance was performed at intervals of 600 operations. Given the testing done during annual refueling and the

lack of useful trends appearing in the Westinghouse testing, we believe there is no safety benefit derived from trending this parameter.

2. Trip Force - Our maintenance procedure requires the trip force to be measured, with immediate notification of the Maintenance Supervisor if the force exceeds 31 oz. The procedure also calls for tripping the breaker using the UVTA with a 16-20 oz. weight hung on the trip bar, demonstrating that the UVTA has a significant trip force margin when returned to service. Finally, the trip breakers are lubricated during the course of this annual procedure.

During the extensive Westinghouse trip device testing, in which the breakers were operated thousands of times, trip force exceeded the recommended 31 oz. on three breakers. Two received lubrication (dropping the trip force to less than 20 oz.) and the other was left without lubrication. With data taken at intervals of 200 operations, the data points with unusually high trip force were not preceded by a consistent trend upward. Rather the trends were sometimes upward and sometimes downward. The breakers were serviced at intervals of 600 operations and when trip force exceeded 31 oz.

The Westinghouse data did not demonstrate a clear trend in breaker trip force. The Westinghouse test results did show that lubrication of breakers with high trip force returned the trip force to an acceptable level. Our refueling outage interval testing releases breakers for use, properly lubricated, and operating at acceptable force requirements. This annual lubrication precludes the value of trending trip force data. The annual testing also demonstrates the margin of force from the UVTA (the shunt trip attachment (STA) has a much greater margin). Therefore, there is no reason to believe that trended data would serve a useful purpose in predicting problems.

3. Breaker Response Time - The breaker response time is measured and recorded on a refueling outage interval. The data is reviewed by the system engineer responsible for review of reactor protection system response time and is maintained as a plant record. Breaker response time is typically far below the required 167 msec. (A summary of the past five years of test data is attached).

The Westinghouse testing supports consistently large margins in actual trip time for both STA and UVTA devices. The testing found no significant trends after 2500 operations.
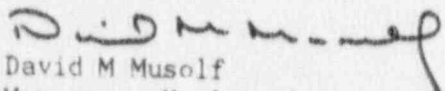
Since large margins exist and are monitored on a refueling outage interval, and since the Westinghouse data showed no significant trends after many operations, we believe that nothing is accomplished by the trending of this data.

The breakers are receiving frequent surveillance and regular scheduled
maintenance. The test data is thoroughly reviewed by the assigned system
engineer utilizing conservative acceptance criteria and is maintained as a
plant record. In view of these practices and evaluation of the data gathered
during the Westinghouse life cycle testing, we do not believe that trending
of trip breaker mechanical parameters is necessary.

Please contact us if you have any questions concerning this response.

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Attachment (Response Time Test Data)

Breaker Response Time Test Data Summary

The information below is the time (milliseconds) elapsed from the under-voltage trip attachment (UVTA) being deenergized until the breaker is physically open. The last 5 data sets for each unit are presented.

Unit 1		Unit 2	
A	B	A	B
90	83	83	81
80	78	84	80
83	83	80	79
78	79	65	73
83	83	69	58

The mean average is 78.6 msec. The worst case (90 msec) is still only 54% of the value assumed in the FSAR, demonstrating significant margin.