VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

June 27, 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
ATTN: Mr. Lester S. Rubenstein, Director
PWR Project Directorate #2
Division of PWR Licensing-A
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Serial NO. 86-334
NO/JWO/jmj:1DJB-001
Docket Nos: 50-280
50-281
50-338
50-339
License Nos: DPR-32
DPR-37
NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY UNITS 1 AND 2
NORTH ANNA UNITS 1 AND 2
SUPPLEMENTAL RESPONSE TO GENERIC LETTER 83-28
ITEMS 4.2.1 AND 4.2.2

This letter discusses our proposed improvements to the Reactor Trip Breaker (RTB) Maintenance Programs at our North Anna and Surry Power Stations. The proposed Maintenance and Testing Program revisions were presented to the NRC staff during our April 7, 1986 meeting in Bethesda, Maryland. The two revisions to the Program consist of:

1. Reducing the number of repetitive RTB tripping in our maintenance procedures from 38 to 27 cycles and,

2. Extending the frequency of the performance of the RTB Maintenance and Testing Program from six months to every twelve months, without exceeding 200 breaker cycles between inspection/maintenance activities.

In addition, each Westinghouse DB-50 RTB on our Surry and North Anna units will be thoroughly inspected and completely refurbished by Westinghouse at least once per 18 months (with extensions as defined in Technical Specifications) for at least three consecutive intervals. The refurbishment program will include tolerance checks on operating parts and returning breakers to "as built" or new condition, and testing the RTBs to new breaker specifications. The first such refurbishment has already been accomplished for our North Anna Units 1 and 2 and is in progress for Surry Unit 1.

A055
1/1

The following paragraphs provide the bases and justification for reducing the number of RTB tripping cycles during maintenance as well as the maintenance frequency.

A. Each of the twenty elements described in the Westinghouse Owners Group (WOG) "Maintenance Program for DB-50 Reactor Trip Switchgear", dated October 14, 1983, with WOG-83-296 cover letter, dated December 15, 1983 will remain in the RTB maintenance program and procedures. The WOG document specifically states that, "The semi-annual activities (frequencies) might be extended to 9-12 months if (operating) experience shows this to be sufficient, provided that 200 breaker cycles are not exceeded during this interval". The twenty elements were also addressed in our responses to NRC Generic Letter 83-28, items 4.2.1 and 4.2.2, and in the NRC Safety Evaluations, dated April 24, 1985 for North Anna and May 3, 1985 for Surry, regarding these responses. The 20 elements remain intact in the RTB maintenance program; only the frequency of the interval or the RTB cycling is decreased.

B. A change to the RTB maintenance program concerning breaker cycling or testing frequency does not involve a change to any present or proposed Technical Specification for Surry or North Anna.

C. The company has documented and trended the RTB performance data for over two years and has verified that the operating experience and data has not indicated any adverse trends in RTB performance. The trending and monitoring of these parameters will continue.

D. Frequently, the semi-annual RTB maintenance must be performed during full power operations, which increases the probability of a reactor trip and the probability of challenges to safety systems. Increasing the time between the maintenance intervals will reduce the opportunity for occurrence of these events without reducing the adequacy of the RTB maintenance program.

E. The periodic surveillance testing of the RTBs will continue on a monthly basis at Surry and bimonthly at North Anna (staggered testing). This testing cycles each RTB, measures the breaker response time (Surry only), and independently verifies operability of the undervoltage trip attachment (UVTA) and the shunt trip at both sites. The system response time is measured during refueling outages at North Anna in accordance with Technical Specification requirements.

F. Our experience indicates that excessive cycling of the RTB reduces the effectiveness of lubrication and increases the wear on RTB components. For example, the alcohol-based molybdenum disulfide UVTA lubricant tends to fall off the UVTA during the energetic opening of the breaker, following evaporation of the alcohol. The finely ground molybdenum disulfide ore can be observed collecting as dust in the breaker, beneath the UVTA and is a primary reason for the implementation of the monitoring and lubricating program every 200 cycles. We have also observed wear on the auxiliary contacts and its latching arm following the repetitive racking in and out operations required by the maintenance and testing programs. In addition, the energetic and repetitive cycling of the RTB's is hypothesized as the cause for losing one of the seven spring clip type lock rings from the grooved ends of the UVTA pivot and latch pins. Two of the three UVTA "failures" that occurred during testing at our Surry

facility after 1981 were due to the loss of a small lock ring which permitted latch or pivot pin displacement and binding of the UVTA. (The third failure was apparently due to an improperly machined UVTA latch pin). Our maintenance procedures require a visual inspection of the lock rings to ensure they are in place and secure. Preoperational inspections and testing of new UVTA's is also performed to ensure operability.

G. Element 17 in the WOG program, "Westinghouse Maintenance Program for DB-50 Reactor Trip Switchgear", identifies the functional RTB check prior to returning the breaker to service. This check closes and trips the breaker electrically and manually to demonstrate that breaker functions including closing, shunt tripping and undervoltage tripping (10 UV trips) are normal. We can determine no firm basis for the 10 undervoltage trips, other than the fact that newly manufactured DB-50 breakers are tripped 10 times by Westinghouse to verify proper operation of the new breaker. After reviewing the comprehensive inspections and testing which we frequently perform on the DB-50 RTBs, we have determined that 10 RTB cycles is excessive. Subsequent to cycling the RTB 25 times during our periodic Maintenance and Testing Program, we will cycle the RTB two more times to complete the functional check of the RTB prior to returning it to service. Our procedures will, of course, ensure that the breaker or components will be cycled several times whenever cleaning and lubrication are performed (page 39 of WOG Procedure).

H. Handling of the RTBs is excessive. Every 6 months, the RTBs must be racked out and removed from their respective cubicles to perform maintenance and testing. The likelihood of electrical or mechanical damage to the breaker and its components increases with the frequency of handling. Similarly, the chance for human error increases when the equipment maintenance and testing increases. In fact, while the design, maintenance, and testing of the RTBs have been improving (e.g. Auto shunt trip, lubrication techniques, response times, etc.) to increase the reliability of the RTB, the probability for human error or accidental component damage has actually increased due to the frequency of the work and the man-hours involved. We hope to reduce the risk of human error by reducing the frequency of the RTB maintenance. Implementation and monitoring of this program will increase the reliability of the Reactor Trip Breakers.

I. As indicated in WCAP-10852, "Report of the DB-50 Reactor Trip Breaker Shunt and UVTA Life Cycle Tests", the shunt trip attachment appears to be a simple and reliable tripping device for the DB-50 RTB. The automatically actuated shunt trip feature has been installed at Surry and North Anna and is routinely tested to verify operability. The shunt trip attachment on each RTB is also inspected to ensure that the trip lever to trip bar clearance is between 0.031 and 0.125 inches. With the addition of the automatic actuation of the shunt trip attachment, diverse features exist to effect a reactor trip for each RTB.

Initially, we were hoping to reduce the number of RTB cycles per year by over 50%; however, after reviewing WCAP-11092 (October 29, 1985 RTB failure at D.C. Cook) and discussing it with members of your staff, we have decided to perform limited testing of our RTBs prior to shipment to Westinghouse for refurbishment. The RTBs will be tested again when they are returned to the

site to measure and record RTB performance data and verify operability. This data is also important to ensure that any problems which may occur during shipping or handling are promptly identified and corrected. We are currently working with Westinghouse on the design and fabrication of a molded and cushioned, form-fitting RTB container which would be environmentally sealed during shipment. The test data would therefore monitor performance of the container and transportation procedures. The RTB containers could also be used on site to store spare RTBs, as required. However, the extension of the RTB Maintenance and Testing Program to 12 month intervals should in itself improve the reliability of the Reactor Trip Breakers.

Perhaps the most significant point of our proposed RTB refurbishment and Maintenance and Testing Programs is that the communications and exchange of information between Westinghouse and the Company will be enhanced. For example, our engineers have observed RTB testing at the Westinghouse facilities and Westinghouse Senior Breaker Engineers have participated in RTB Committee meetings in Virginia. This team effort by vendor and user will help to ensure reliable Reactor Trip Breaker operation.

We plan to implement our proposed revisions to the RTB Maintenance and Testing Programs within the next 90 days at our Surry and North Anna facilities. If you require additional information or have any questions, please contact us.

Very truly yours,

W. L. Stewart

Attachments

cc: Dr. J. Nelson Grace
Regional Administrator
Region II

NRC Senior Resident Inspector
North Anna Power Station

NRC Senior Resident Inspector
Surry Power Station

Mr. L. B. Engle
NRC North Anna Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A

Mr. C. Patel
NRC Surry Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A