

TENNESSEE VALLEY AUTHORITY

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JUN 2 1988

WBRD-50-390/86-16  
WBRD-50-391/86-34

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of )  
Tennessee Valley Authority ) Docket Nos. 50-390  
50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - EXTREME WEAR SHOWN ON THE  
WESTINGHOUSE SWITCHGEAR BREAKERS - WBRD-50-390/86-16 AND WBRD-50-391/86-34 -  
SUPPLEMENTAL FINAL REPORT

The subject deficiency was initially reported to NRC Region II Inspector Bob Carroll on December 26, 1985, in accordance with 10 CFR 50.55(e) as Nonconformance Report (NCR) W-318-P. Interim reports were submitted on January 27 and April 10, 1986. A letter correcting the submittal date for this report was submitted on April 28, 1986. A final report was submitted on June 6, 1986. Enclosed is our supplemental final report. This report is the result of a commitment made in TVA's response to violation 390, 391/87-13-01.

Please note that the correct unit 2 CDR number for this report is WBRD-50-391/86-34. Our earlier submittals had incorrectly given the number as WBRD-50-391/86-33.

If there are any questions, please telephone C. J. Riedl at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



R. Gridley, Director  
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Enclosure  
cc: See page 2



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## ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2  
EXTREME WEAR SHOWN ON THE 480V  
WESTINGHOUSE SWITCHGEAR BREAKERS,  
WBRD-50-390/86-16 AND WBRD-50-391/86-34  
NCR W-318-P  
10 CFR 50.55(e)

### SUPPLEMENTAL FINAL REPORT

#### DESCRIPTION OF DEFICIENCY

The Westinghouse 480V switchgear breakers (electrically operated) motor cutoff switch levers are showing extreme wear. Trending indicates the levers will fail at 2000 to 3000 breaker trips. Failure of the levers will render the automatic function of the breakers inoperable and could be critical during emergency load shedding if the breakers require reclosing.

The apparent cause of this deficiency has been determined to be (1) insufficient lubrication of the moving parts of the breaker in that the number of breaker operations was underestimated by TVA, resulting in insufficient maintenance of the breakers, and (2) the incorrect type of lubricant was used because WBN Maintenance Instructions were not within the requirements of the current vendor recommendations.

#### SAFETY IMPLICATIONS

Excessive wear could cause the motor cutoff switch levers to break or fail, thus preventing remote closure operation of the breakers. TVA has identified 29 breakers (table 1) which supply power to safety-related loads and receive automatic closure signals after the load has been shed upon a loss of offsite power or after the failure of the load's redundant counterpart. Failure of the breakers to energize to the closed position would subsequently prevent the pickup of class 1E loads. This condition could adversely affect the safe operation of the plant during emergency load shedding and shutdown conditions.

#### CORRECTIVE ACTION

TVA has changed the breaker lubricant from molybdenum disulfide in alcohol suspension to Moly Kote BR2 Plus grease, which is a Dow-Corning lubricant recommended in the manufacturer's instructions, I.B. 33-790-1F, effective October 1983; and the Maintenance Manual for DS416, Reactor Trip Circuit Breakers (MUHN-2051). TVA's second interim report on this subject to NRC dated April 10, 1986, stated that as a result of using Moly Kote BR2 Plus in the performance of maintenance on the Westinghouse reactor trip breakers, it was determined that this lubricant would not flow to reach the surfaces for which it is intended without major disassembly of the breaker, not normally required for routine maintenance. TVA's final report to NRC dated June 17, 1986, stated that it had been determined that the Moly Kote BR2 Plus lubricant will perform acceptably in this application with routine maintenance. While this latter statement is accurate, the following provides a clarification: It

is realized that the Moly Kote BR2 Plus will not flow to reach some surfaces. However, it has been determined that lubrication of the cutoff lever surface can be accomplished without major disassembly by use of a device like a syringe, a long slender screwdriver, or a stiff wire. Moly Kote BR2 Plus will therefore be used to lubricate these surfaces as part of our preventive maintenance program.

The wear limit on existing worn cutoff switch levers is defined as the point at which the thinnest portion of the crescent-shaped worn spot is 50 percent of the original lever thickness. Westinghouse recommends that levers should be replaced at that point. Inspections of these 29 class 1E breakers cutoff switch levers have been completed. Four of the 29 levers were replaced. Any necessary replacement of the remaining spring motor charging cutoff switch levers is addressed in the normal maintenance program through inclusion of periodic inspection and replacement requirements in Maintenance Instruction MI-57.2.

In our final report it was stated that in order to prevent recurrence, TVA has revised MI-57.2, "Annual 480V Circuit Breaker Instructions," to require breaker lubrication every 500 breaker cycles, or annually, whichever comes first. TVA has changed this approach. In order to comply with vendor requirements, TVA will revise MI-57.2 to include the requirement to perform breaker maintenance (including lubrication) based on breaker cycles; 250 operations for DS-632 breakers, 1750 operations for DS-206 breakers, and 500 operations for DS-416 breakers. (Note: This schedule may be extended to the next outage for those breakers that cannot be taken out of service during plant operation.) Trip counters will be installed as necessary to fulfill this commitment. All counters will be installed and the lubrication schedule based on breaker operation initiated before fuel load of the respective unit.

TABLE 1

CLASS 1E 480V SWITCHGEAR BREAKERS RECEIVING  
AUTO CLOSURE SIGNAL WHICH COULD ADVERSELY  
AFFECT SAFE OPERATION OF THE PLANT

Component cooling system pump 1A-A  
Component cooling system alternate feeder  
Component cooling system pump 1B-B  
Component cooling system pump 2A-A  
Component cooling system pump 2B-B  
Station fire pump 1A-A  
Station fire pump 1B-B  
Station fire pump 2A-A  
Station fire pump 2B-B  
480V shutdown board room air handling unit A-A  
480V shutdown board room air handling unit C-B  
480V shutdown board room air handling unit B-A  
480V shutdown board room air handling unit D-B  
480V shutdown board room chiller package B-B  
480V shutdown board room chiller package A-A  
Electrical board room air handling unit A-A  
Electrical board room air handling unit C-B  
Electrical board room air handling unit B-A  
Electrical board room air handling unit D-B  
Electrical board room air-conditioning compressor A-A  
Electrical board room air-conditioning compressor B-B  
Containment air return fan 1A-A  
Containment air return fan 1B-B  
Containment air return fan 2A-A  
Containment air return fan 2B-B  
Auxiliary control air compressor A  
Auxiliary control air compressor B  
Control room air-conditioning compressor A-A  
Control room air-conditioning compressor B-B