

TENNESSEE VALLEY AUTHORITY
ATLANTA, GEORGIA
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

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October 19, 1981

WBRD-50-390/81-43
WBRD-50-391/81-42



Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - MOTORS RATED 440 VOLTS ON A
480-VOLT SYSTEM - WBRD-50-390/81-43, WBRD-50-391/81-42 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
R. V. Crlenjak on April 27, 1981 in accordance with 10 CFR 50.55(e)
as NCR WBN EEB 8104. Our interim reports were submitted on May 27 and
September 10, 1981. Enclosed is our final report.

If you have any questions, please get in touch with R. H. Shell at
FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills
L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

cc: Mr. Victor Stello, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
MOTORS RATED 440 VOLTS ON A 480-VOLT SYSTEM
WBRD-50-390/81-43, WBRD-50-391/81-42
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

There are 14 motors that have a nameplate voltage rating of 440 volts ac and are supplied from the 480-volt ac Class 1E auxiliary power system of units 1 and 2. NEMA MG1-12.43, 1967, requires that induction motors must be capable of operating under the steady-state running conditions with a voltage variation of plus or minus 10 percent at rated frequency. The maximum voltage these motors can withstand is 484 volts. This contrasts with 506 volts that a motor rated 460 volts can withstand. TVA design allows a maximum voltage of 506 volts at the motor terminals, which is 15 percent above rated voltage for those motors rated 440 volts. This discrepancy was discovered in the preparation of the field nameplate verification list on the 480-volt shutdown board load.

Safety Implications

As is stated below, only the eight auxiliary feedwater (AFW) pump lube oil pump motors are not capable of safely withstanding an overvoltage. The failure of the lube oil pumps could result in the AFW pump motors overheating. If the AFW pump motors could not properly function, the safety of the plant would be degraded.

Corrective Actions

The four diesel generator lube oil circulating pumps and the two control bay sump pumps are not Class 1E and are not necessary for safe shutdown of the plant. Only the eight auxiliary feedwater pump lube oil pumps remain to be qualified.

It has been determined through communications with the contractor that the eight remaining motors are rated 440 volts and are not capable of safely withstanding the normal operating voltage of 460 plus 10 percent (i.e. 506 volts). Therefore, the contractor has been requested to quote a price for replacement of these motors with motors rated at 460 volts ac. The new motors are also to be environmentally qualified to NUREG-0588 and meet all the requirements of IEEE 323-1974.

These motors will be replaced by unit 1 fuel load.