TENNESSEE VALLEY AUTHORITY

5N 157B Lookout Place

86 APR 28 P1:20

April 23, 1986

WBRD-50-390/86-23
WBRD-50-391/86-19

U.S. Nuclear Regulatory Commission
Region II
Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - DIESEL GENERATOR ELECTRICAL BOARD ROOM EXHAUST FAN FLOW RATES - WBRD-50-390/86-23, WBRD-50-391/86-19 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector Al Ignatonis on January 9, 1986 in accordance with 10 CFR 50.55(e) as NCR W-311-P. Enclosed is our final report. We consider 10 CFR Part 21 applicable to this deficiency.

If there are any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. L. Gridley, Director
Nuclear Safety and Licensing

Enclosure
cc: Mr. James Taylor, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center (Enclosure)
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
DIESEL GENERATOR ELECTRICAL BOARD ROOM EXHAUST FAN FLOW RATES
WBRD-50-390/86-23, WBRD-50-391/86-19
NCR W-311-P
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

A deficiency has been identified for Watts Bar Nuclear Plant (WBN) in which diesel generator (DG) 480V electrical board room exhaust fans 1A-A, 1B-B, 2A-A, and 2B-B will not supply rated airflow without their respective motors tripping on overload. This deficiency was previously documented on nonconforming condition report (NCR) W-64-P. In investigating NCR W-64-P, TVA determined that the fans' rotational speed had been adjusted via adjustable motor sheaves to an operating speed above the design limits of the motor. The disposition of NCR W-64-P required a readjustment of the fans' rotational speed. This apparently resolved the deficiency for short-term (test) operation only. Subsequent long-term operation has again resulted in the fan motors tripping on overload. This has been documented on NCR W-311-P.

The subject fan motors are 1-1/2 hp, 182T frame, 1800 r/min, Reliance Duty Master XT motors with a nameplate full-load current rating of 3.3 amps. TVA has tested the motors with no load connected (i.e., with the fan belts off) and the test data has shown that the motor no-load amperage is higher than the motor nameplate full-load amperage. At no-load operation, the motors draw 3.8 amps and each winding leg measures 6.1 ohms resistance. The manufacturer, Reliance Electric Company, Cleveland, Ohio, has confirmed that the internal motor connections and winding resistance are correct. The motors were supplied to TVA by the H. K. Porter Company, Warren, Ohio, on TVA contract No. 76K35-83184-5.

Although the exact cause of this deficiency cannot be determined until an examination and analysis of the motors is performed by the manufacturer, TVA considers that the apparent cause is that the motors' nameplate data is in error. The motors are 1-1/2 hp in a 182T frame and are nominally rated 3 hp. In derating the motors to 1-1/2 hp, the manufacturer has apparently miscalculated the full-load current.

Safety Implications

A failure of the fans to provide design-specified air flowrates could result in a temperature increase in the DG electrical board room to a temperature in excess of 104°F. This could adversely affect the operation of essential electrical equipment in the room, and subsequently, the performance of an associated DG. As such, the subject deficiency could adversely affect the safety of operations of the plant.

Corrective Action

TVA will replace the subject fan motors. The replacement motors are 2 hp, 182T frame, 1800 r/min, Reliance Duty Master XT motors which are qualified in accordance with IEEE Standards 112, 323, 334, and 344. The discrepant motors will be returned to the manufacturer for evaluation to determine the exact cause of this condition. The discrepant motors will be repaired if economically feasible, and, if repaired, will be returned to TVA and stocked as spares. Engineering change notice (ECN) 6219 has been initiated to accomplish this corrective action.

TVA now requires a complete motor test (IEEE 112, form A-2) for each new motor procurement for motors to be used in nuclear power plant safety-related ventilation equipment. This requirement is contained in TVA's Division of Nuclear Engineering Design Standard Specification SS-E9.2.01 R4, "Alternating Current Induction Motors," subsection 8.1.3. This requirement will prevent recurrence of this deficiency.

All necessary corrective actions for this item will be completed by initial fuel loading for WBN units 1 and 2, respectively.