

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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SEP 09 1988

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

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 - DIESEL GENERATOR ELECTRICAL BOARD ROOM EXHAUST FAN FLOW RATES - WBRD-50-390/86-23 AND WBRD-50-391/86-19 - REVISED 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 Nonconformance Report (NCR) W-311-P. Our interim and final reports were submitted on February 10 and April 23, 1986. Enclosed is our revised final report. No new commitments are contained in this report. We consider 10 CFR Part 21 applicable to this deficiency.

If there are any questions, please telephone G. R. Ashley at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY.

R. Gridley, Manager
Nuclear Licensing and
Regulatory Affairs

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

SEP 09 1988

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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 AND WBRD-50-391/86-19
NCR W-311-P
10 CFR 50.55(e)

REVISED 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. Portor Company, Warren, Ohio, on TVA contract No. 76K35-83184-5.

Although the exact cause of this deficiency cannot be determined without an examination and analysis of the motors by the manufacturer, TVA considers that the following is the apparent cause: 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 and provided erroneous motor nameplate data.

Safety Implications

A failure of the fans to provide design-specified air flow rates 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 during design basis events requiring operation of the DGs.

Corrective Action

TVA has replaced 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 Institute of Electrical and Electronics Engineers (IEEE) Standards 112, 323, 334, and 344. Engineering Change Notice (ECN) 6219 was initiated to accomplish this corrective action.

In our previous report on this issue, it was stated that the discrepant motors would be returned to the manufacturer for evaluation to determine the exact cause of this condition, and if economically feasible the motors would be repaired and restocked as spares. However, TVA has determined that manufacturer evaluation would not provide beneficial information for TVA, and repair of the motors will not be economically feasible. Therefore, the motors will be scrapped.

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 Nuclear Engineering Design Standard Specification SS-E9.2.01, revision 4, "Alternating Current Induction Motors," subsection 8.1.3. This requirement will prevent recurrence of this deficiency.

All necessary corrective actions for this item have been completed.