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MAY 27 1987

WBRD-50-390/87-12
WBRD-50-391/87-13

10 CFR 50.55(e)

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

Gentlemen:

WATTS BAR NUCLEAR PLANT (WBN) - UNITS 1 AND 2 - POSSIBLE FAILURE OF RELAYS TO OPEN IN DIESEL GENERATOR CONTROL PANELS - WBRD-50-390/87-12 AND WBRD-50-391/87-13 - INTERIM REPORT

The subject deficiency was initially reported to NRC-Region II Inspector Gordon Hunegs on April 24, 1987, in accordance with 10 CFR 50.55(e) as SCR WBN EEB 86108. Part 10 CFR 21 is considered applicable to this deficiency. Enclosed is our interim report. We expect to submit our next report on or about March 7, 1988.

If there are any questions, please call R. D. Schulz at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

for R. Gridley, Director
Nuclear Safety and Licensing

Enclosure
cc See page 2



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U.S. Regulatory Commission

MAY 27 1987

cc (Enclosure):
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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
POSSIBLE FAILURE OF RELAYS TO OPEN IN DIESEL
GENERATOR CONTROL PANELS
WBRD 50-390/87-12, WBRD 50-391/87-13
SCR WBN EEB 86108
10 CFR 50.55 (e)
INTERIM REPORT

Description of Deficiency

A condition has been identified whereby 13 continuously energized Square D direct current (DC) relays in each diesel generator (DG) control panel may fail to open upon loss of power. This condition was discovered at the Trojan Nuclear Plant when a continuously energized relay failed to open during testing. The failure was due to residual magnetism which built up over an extended period of time (estimated three to five years) while the relay was held in the energized (closed) position. The relay had been continuously energized for almost 10 years. This residual magnetism was sufficient to prevent the relay from opening when power was removed. The diesel generators for both Trojan Nuclear Plant and Watts Bar Nuclear Plant (WBN) are similar in design and were supplied by Morrison-Knudson Company, Rocky Mount, North Carolina. When WBN becomes operational, these same relays will be constantly energized and susceptible to the same type of failure that occurred at Trojan Nuclear Plant.

Safety Implications

The DGs comprise a safety system required for safe shutdown of the plant. In the event of loss of nuclear unit power concurrent with loss of preferred (offsite) power, the DGs become the only source capable of supplying essential class 1E alternating current (AC) power greater than 120 volts for safety-related equipment (this includes centrifugal charging pumps, safety injection pumps, residual heat removal pumps, essential raw cooling water pumps, component cooling water pumps, and others). This equipment is required for safe shutdown and maintaining the plant in a safe mode and/or mitigating the consequences of an accident.

The design function of relays in each DG board which could fail due to residual magnetism is as follows:

- Three relays are required for automatic starting of the DG.
- Nine relays are required to provide indication that fuses within the DG control panel have blown.
- One relay is required to provide indication that there has been a loss of power to the logic controls of the DG panel.

Failure of these relays to open would create a condition whereby the DG would not be able to provide the required source of standby electrical AC power. Therefore, this condition would adversely affect the safety of operations for the plant when an onsite source of emergency AC power is needed.

Interim Progress

TVA plans to perform testing of the affected relays utilizing an independent testing agency to establish a basis for corrective actions which should be taken. Preliminary review of the condition has determined that one of the following actions may be taken:

- Replace the relays with a different type DC relay.
- Replace the relays with AC relays.
- Demagnetize the existing relays during periodic maintenance.
- Replace the relays every 18 months to preclude the buildup of residual magnetism.

Additionally, TVA will review for the use of the Square D relays in other plant systems which could be adversely affected by a buildup of residual magnetism.

TVA will submit a final report to NRC describing our selected corrective action and the results of our evaluation of the use of the Square D relays in other plant systems on or before March 7, 1988.