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MAR 21 1988

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:

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

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 - SECOND 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. This deficiency is considered reportable under 10 CFR 21. Our first interim report was submitted on May 27, 1987. Enclosed is our second interim report. A final report will be submitted or or about August 14, 1989.

Gordon Hunegs was notified of delays in submitting this report on March 9 and 11, 1988.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
Nuclear Licensing and
Regulatory Affairs

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

MAR 21 1988

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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 AND WBRD 50-391/87-13
SCR WBN EEB 86108
10 CFR 50.55(e)

SECOND INTERIM REPORT

Description of Deficiency

A condition has been identified whereby 13 continuously energized Square D direct current (DC) relays (class 8501, type KPD-13) in each diesel generator (DG) control panel may fail to open upon loss of power. This condition was discovered when a continuously energized relay failed to open during testing at the Trojan Nuclear Plant. The diesel generators for both Trojan Nuclear Plant and Watts Bar Nuclear Plant are similar in design and were supplied by Morrison-Knudson Company, Rocky Mount, North Carolina. The failure is the result of residual magnetism which builds up over an extended period of time (estimated three to five years) while the relay is held in the energized (closed) position. The relay at Trojan Nuclear Plant had been continuously energized for almost ten years. This residual magnetism was sufficient (at Trojan) to prevent the relay from opening when power was removed. When Watts Bar Nuclear Plant 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 as a result of 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 could create a condition whereby the DG would not be able to provide the required source of standby electrical AC power. Therefore, this condition could adversely affect the safety of operations for the plant when an onsite source of emergency AC power is needed.

Corrective Action

For each relay in the DG panels that is normally energized and subject to developing residual magnetism over an extended period of time, the following corrective action will be taken: Either the relay motor assembly will be replaced or the entire relay will be replaced with a relay that is not subject to developing residual magnetism. The applicable design documents will also be revised to reflect modifications.

TVA will also evaluate the adequacy of applications other than the diesel generator panels involving these Square D relays in a normally energized state. Any applications determined to be unacceptable will be corrected as stated above.

A final report on this item, including the results of our evaluations of applicability to other plant systems, will be submitted on or about August 14, 1989.