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TENNESSEE VALLEY AUTHORITY

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WBRD-50-390/86-42
WBRD-50-391/86-41

JUL 31 1986

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 (WBN) - UNITS 1 AND 2 - POTENTIAL MALFUNCTION OF REACTOR PROTECTION SYSTEM PERMISSIVE P-10 FUNCTION - WBRD-50-390/86-42, WBRD-50-391/86-41 - FINAL REPORT

The subject deficiency was initially reported to NRC-Region II Inspector Bob Carroll on March 31, 1986, in accordance with 10 CFR 50.55(e) as SCRs WBN NEB 8613 and WBN NEB 8614, for units 1 and 2 respectively. Our interim report was submitted on April 29, 1986. 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 J. A. McDonald at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R Gridley

R. L. Gridley, Director
Nuclear Safety and Licensing

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

Records Center
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
POTENTIAL MALFUNCTION OF REACTOR PROTECTION SYSTEM
PERMISSIVE P-10 FUNCTION
WBRD-50-390/86-42, WBRD-50-391/86-41
SCR WBN NEB 8613 AND SCR WBN NEB 8614
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Westinghouse Electric Corporation notified TVA of a potential malfunction of the reactor protection system (RPS) P-10 permissive function which could result in a failure of the Watts Bar Nuclear Plant (WBN) RPS to provide adequate protection at low reactor power. Westinghouse notified NRC of this item on February 26, 1986 in their letter No. NS-NRC-86-3108. The affected P-10 function automatically enables the "low power" reactor trips (power range neutron flux trip - low set point and intermediate range high neutron flux trip) and restores power to the neutron flux detectors when reactor power level falls below the P-10 set point (10 percent power) in three of the four power range neutron flux channels. In order to meet single failure criteria, all four channels must be operable to ensure that the above-mentioned safety functions are enabled. However, since the technical specifications allow a single power range neutron flux channel to be taken out of service with power removed from its associated P-10 bistable, and since the P-10 bistables must energize to actuate the low power protection logic, a single failure in one channel will disable the low power safety functions mentioned above if a channel is taken out of service.

The RPS at WBN was supplied to TVA by Westinghouse under the nuclear steam supply system (NSSS) contract No. 71C62-54114-1. The subject deficiency is applicable to all plants with Westinghouse-designed RPSs.

Westinghouse has notified TVA that they have determined the root cause of this deficiency to be an inadequate design review of this permissive function, considering all modes of operations. The method of initiating P-10 was considered acceptable, but should have been reconsidered when the technical specifications permitted a channel to be out of service indefinitely.

Safety Implications

As identified by Westinghouse, the subject condition could result in a plant condition which is outside of the design bases of the plant as analyzed in the WBN FSAR Chapter 15. Thus, the condition potentially could adversely affect the safety of operations of the plant.

Corrective Action

NRC-NRR raised this issue in 1984 during its review of draft technical specifications for WBN (see E. Adensam's letter to H. G. Parris dated August 22, 1984). In response, TVA proposed necessary changes to the technical specifications. The proposed changes, transmitted in J. A. Domer's letter to E. Adensam dated January 3,1985, required all four channels to be operable, and an action statement was proposed to require inoperable channels to be promptly returned to operable status. TVA is making certain modifications to the previously proposed changes, but these affect details which do not alter the intent of the previous submittal. The revised technical specification change proposal will be submitted to NRC-NRR by August 31, 1986, for review. TVA's position is that the necessary corrective actions for this deficiency will be achieved through the technical specification changes. Final resolution will be achieved before fuel load of each unit.

Westinghouse has notified TVA that to lessen the probability of future similar occurrences, Westinghouse has initiated a design review of all permissives. To date, no situation similar to the P-10 issue has been identified.