

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

84 SEP 19 8 25 AM September 14, 1984

WBRD-50-390/84-32
WBRD-50-391/84-29

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

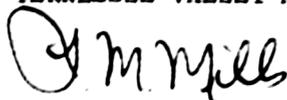
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - ERRATIC OPERATION OF STEAM GENERATOR
BLOWDOWN ISOLATION VALVES - WBRD-50-390/84-32, WBRD-50-391/84-29 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
P. E. Fredrickson on June 11, 1984 in accordance with 10 CFR 50.55(e) as NCR
WBN NEB 8407. Our first interim report was submitted on July 3, 1984. Enclosed
is our final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY



L. M. Mills, Manager
Nuclear Licensing

Enclosure

cc: Mr. Richard C. DeYoung, 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
ERRATIC OPERATION OF STEAM GENERATOR BLOWDOWN ISOLATION VALVES
NCR WBN NEB 8407
WBRD-50-390/84-32, WBRD-50-391/84-29
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

While conducting preoperational test W-3.1F, the steam generator blowdown isolation valves (FCV 1-7, 1-14, 1-25, 1-32, 1-181, 1-182, 1-183, and 1-184) performed unreliably. Several of these valves improperly reopened upon the engineered safety feature (ESF) actuation signal reset, and valve limit switch contacts were found to be damaged. There was also a question regarding valve leakage at atmospheric pressure and slow operating times.

In investigating this nonconformance report (NCR), TVA has determined that the damage to the limit switches caused the switches to fail in the closed position, which, due to circuit design, caused valve reopening upon the ESF signal reset, and was also responsible for the valve leakage and questionable operating times. These switches have a continuous current rating of 0.5 amp at 125V dc. However, TVA's circuit design placed these switches in series with the solenoid valve which draws a continuous current of 3.5 amps, thus exposing the switches to excessive currents.

TVA has determined that the cause of this situation was a failure on the part of design personnel to note (during the squadchecking of vendor documents) that these large Target Rock solenoid valves drew an unusually high current relative to the solenoid valves used in the rest of the plant. Because this characteristic was not noted, the TVA schematic was not modified to accommodate the new coil burden.

Safety Implications

Failure of the steam generator blowdown isolation valves to function properly with an isolation signal or to remain closed during an ESF actuation signal reset could allow a breach in containment isolation which could adversely affect safe operation of the plant.

Corrective Action

TVA has revised the unit 1 valve control circuit drawings and is revising the unit 2 drawings. These circuit revisions remove the limit switches from their series connection to the coils by use of low burden interposing relays. The circuit modifications are being accomplished under engineering change notices (ECN) 4913 and 4914 for units 1 and 2, respectively. TVA expects to have these modifications completed for unit 1 by October 1, 1984, and by October 1, 1985, for unit 2. TVA has also performed an analysis of the circuit redesign and a valve leak test subsequent to W-3.1F and has determined the modified circuits will eliminate all leakage and operating time difficulties.

To prevent a recurrence of this problem, affected TVA design personnel have been reformed of the requirement located in Engineering Procedure (EP) 4.04, "Squadchecking Process," to ensure that equipment performs properly under all required conditions.