TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

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May 17, 1985

WBRD-50-390/85-05
WBRD-50-391/85-04

U.S. Nuclear Regulatory Commission
Region II
Attn: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - POTENTIAL DEFICIENCY IN IMPROPERLY RATED FIELD WIRING TO SOLENOID VALVES - WBRD-50-390/85-05 AND WBRD-50-391/85-04 - REVISED FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector A. Ignatonis on December 13, 1984 in accordance with CFR 50.55(e) as NCR WBN EEB 8425. Our first interim and final reports were submitted on January 25 and February 14, 1985, respectively. Enclosed is our revised 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

J. W. Hufham, Manager
Licensing and Regulations

Enclosure
cc: Mr. James Taylor, 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
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
POTENTIAL DEFICIENCY IN IMPROPERLY RATED FIELD WIRING TO SOLENOID VALVES
WBRD-50-390/85-05 AND WBRD-50-391/85-04
NCR WBN EEB 8425
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

A deficiency has been identified at Watts Bar Nuclear Plant (WBN) involving field-installed electrical cables. Specifically, field wiring that terminates within the housing of certain solenoid valves has insulation which is not rated for temperatures which could possibly be generated within the valves. This condition was originally identified in NRC-OIE Information Notice 84-68.

Two manufacturers of solenoid valves procured by TVA for WBN and requiring field wiring to terminate within the housing are Target Rock and Valcor. These valves have been identified as having potential internal temperatures reaching 280°F. TVA presently uses wire with insulation rated at either 90°C (194°F) or 125°C (257°F) to terminate solenoid valves. Solenoid valves from other manufacturers procured by TVA which do not have vendor-supplied pigtails could also be affected.

The cause of this problem was the lack of documentation on the operating valve housing temperatures.

This condition has also been identified for Bellefonte Nuclear Plant (BLN) and is being separately reported as nonconformance report (NCR) BLN EEB 8418 (BLRD-50-438/85-03, BLRD-50-439/85-03).

Safety Implications

The use of electrical cable with inadequate temperature-rated insulation within a high ambient temperature valve body could cause the insulation to degrade prematurely. This could result in cable insulation failure and could possibly result in a failure of the ability of an affected valve to perform an intended safety function. With regard to WBN, TVA has determined by analysis that only two Target Rock valves, TVA UNID Nos. 0-FSV-32-61-A and 0-FSV-32-87-B, would be significantly affected by the 280°F temperature which could be reached inside the valve housing. If the insulation of the field wires for these valves failed, the fuses protecting the circuit could be blown. Since the affected valves and the controls for the control air compressor start circuits are fused across the same power supply, the control air compressors could become inoperable. This could adversely affect the safe operation of the plant.

Corrective Action

TVA has identified all valves in use at WBN that have field wiring which terminates in a valve housing, and as stated in the safety implications, has identified only two valves in the control air system could be adversely affected by the subject deficiency. The field wiring inside the solenoids for these two valves will be replaced per engineering change notice (ECN) 5413 by May 22, 1985.

To prevent recurrence of this problem, a design input memorandum (DIM) WB-DC-30-5-2 to WBN design criteria WB-DC-30-5 was issued on March 14, 1985, to ensure that properly rated field wiring is used in applications involving terminations within solenoid valve housings on valves such as Target Rock or Valcor.