

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

October 17, 1985

WBRD-50-390/85-40
WBRD-50-391/85-39

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

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Dear Dr. Grace:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - SUSPECT TERMINALS ON GE TYPE PK TEST
BLOCKS - WBRD-50-390/85-40, WBRD-50-391/85-39 - FIRST INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector
Al Ignatonis on September 18, 1985 in accordance with 10 CFR 50.55(e) as NCR
W-267-P. Enclosed is our first interim report. We expect to submit our next
report on or about November 25, 1985. We consider 10 CFR Part 21 applicable
to this deficiency.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Dome
J. W. Hufham, Manager
Licensing and Risk Protection

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
Atlanta, Georgia 30339

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
SUSPECT TERMINALS ON GE TYPE PK TEST BLOCKS
WBRD-50-390/85-40, WBRD-50-391/85-39
NCR W-267-P
10 CFR 50.55(e)
FIRST INTERIM REPORT

Description of Deficiency

TVA has experienced two failures of General Electric (GE) PK test block terminal studs during an inspection of spare terminals on these type blocks. The failures occurred with terminals on blocks used in the non-safety-related 6.9-kV unit board 1A, breaker 1522 trip cutout block TD 86522, and unit board 2D, breaker 1634 trip cutout block TD 886634. Both terminal studs fractured easily when pulled during an inspection which had been initiated because similar fractures had occurred in non-safety-related equipment at Sequoyah Nuclear Plant. Because the 6.9-kV unit boards and the safety-related 6.9-kV shutdown boards were procured under the same contract, the PK blocks are the same type for either application. Also, these same type blocks are used on various other safety-related systems.

According to GE, the cause of this problem was that the suppliers did not always supply the correct material and use the appropriate fabrication process for the terminal studs.

Safety Implications

Although there have been no failures of terminal studs on PK test blocks used with safety-related systems, the potential for such a failure exists since no distinction has been found between PK blocks supplied for use with IE or non-IE circuits. If one or more terminal studs failed in safety-related equipment (e.g., the 6.9-kV shutdown boards or the diesel generator relay boards) their circuits could be lost through either a loss of continuity or short circuiting, or an energized terminal could physically fall and cause arcing and possibly an electrical fire. Any of these potential situations could adversely affect safe operation of the plant.

Interim Progress

TVA sent the terminal studs to its central labs in Chattanooga for testing. The test report revealed that the composition of the terminals was a 70-30 copper-zinc alloy; that both studs had fractured adjacent to a cold-formed hexagonal-headed portion near the center of the studs; and that one of the fractures displayed a large-grained intergranular fracture while the other shows a more ductile-type transgranular fracture surface. The report concludes that the primary cause for these failures is the highly cold-worked and unheat-treated material present at the sharp-cornered head area.

TVA has been in contact with GE, who must determine the corrective actions necessary; TVA has also contracted with Battelle Columbus to investigate this problem. We will provide our next report on or about November 25, 1985.