TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

NRC REGION II
ATLANTA, GEORGIA

81 DEC 31 A8:35

December 29, 1981

BLRD-50-438/81-62
BLRD-50-439/81-60
WBRD-50-390/81-78
WBRD-50-391/81-74
HTRD-50-518/81-24
HTRD-50-520/81-23

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

BELLEFONTE AND WATTS BAR NUCLEAR PLANTS UNITS 1 AND 2 AND HARTSVILLE NUCLEAR PLANT UNITS A1 AND A2 - DEFICIENT CABLES MANUFACTURED BY ROCKBESTOS - BLRD-50-438/81-62, BLRD-50-439/81-60; WBRD-50-390/81-78, WBRD-50-391/81-74; HTRD-50-518/81-24, HTRD-50-520/81-23 - FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector R. V. Crlenjak on September 21, 1981 in accordance with 10 CFR 50.55(e) as NCR's BLN EEB 8103 and WBN EEB 8110. Hartsville NCR HTN EEB 8101 was initially reported to R. V. Crlenjak on October 5, 1981. This was followed by our first interim report dated October 21, 1981. Enclosed is our final report. We consider 10 CFR Part 21 applicable to this deficiency.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

RECEIVED
JAN 5 1982

Enclosure
cc: Mr. Richard C. DeYoung, Director (Enclosure)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

OFFICIAL COPY

8201060466 811229
PDR ADOCK 05000390
S PDR

An Equal Opportunity Employer

IE 27

ENCLOSURE

BELLEFONTE AND WATTS BAR NUCLEAR PLANTS UNITS 1 AND 2
AND HARTSVILLE NUCLEAR PLANT UNITS A1 AND A2
DEFICIENT CABLES MANUFACTURED BY ROCKBESTOS
BLRD-50-438/81-62, BLRD-50-439/81-60; WBRD-50-390/81-78, WBRD-50-391/81-74;
HTRD-50-518/81-24, HTRD-50-520/81-23
10 CFR 50.55(e)
FINAL REPORT

Description of Deficiency

Coaxial, twinaxial, and triaxial cables with solid dielectrics manufactured by the Rockbestos Company, New Haven, Connecticut, and bearing their part Nos. RSS-6-100 through RSS-6-112 were reported by the manufacturer as subject to failure at temperatures above 230°F. These cable types had previously been qualified by a type test in accordance with IEEE 383-1974 to a containment temperature of 340°F and a high emergency line break (HELB) temperature of 440°F using type RSS-6-102 cable. Subsequent testing by the manufacturer on a type RSS-6-104 developed a failure mode wherein the center conductor shorted to the braided shield.

Expansion of the solid dielectric when heated causes foreshorting of the braided shield, which in turn results in longitudinal compression and kinking of the center conductor. This kinking, combined with heat, may cause thermal stress cracking of the insulation, thus permitting electrical failure.

These types of cables are potentially planned to be used in Class IE systems within containment wherein they are expected to withstand temperatures in excess of 230°F. In addition, these cables are expected to withstand HELB temperatures in excess of 230°F outside of containment in Class IE systems.

In TVA's previous report on this deficiency, it was reported that cables manufactured by Raychem Corporation are subject to failure under the same conditions that the Rockbestos cables fail. Subsequent testing by the manufacturer has determined that the Raychem cables do not fail as the Rockbestos cables do. This is because of the use of a different material in the solid dielectric that does not cause foreshorting of the braided shield and thus eliminates the root cause of the deficiency.

Safety Implications

The subject cables may be determined to be installed or scheduled to be installed in Class IE systems where HELB transient temperatures could exceed the degradation temperatures of the cable coatings. This could result in a loss-of-function of the affected Class IE systems, thus potentially compromising the safe operation of the plant.

Corrective Action

An investigation has determined that each of the above nuclear plants has none of the Rockbestos type RSS-6-100 through RSS-6-112 cables installed in Class IE systems where the temperature exceeds 230°F. Each of the above nuclear plants has been directed to remove from the site all quantities of these RSS-6-100 through RSS-6-112 cables held in stock by February 19, 1982.

TVA proposes to replace existing stocks of these types with qualified cables.

The manufacturer has ceased to make any additional cable and is evaluating a new design to overcome the temperature deficiency.