

TENNESSEE VALLEY AUTHORITY

KNOXVILLE, TENNESSEE 37902

5N 157B Lookout Place

JUL 14 1988

WBRD-50-390/86-34  
WBRD-50-391/86-31

10 CFR 50.55(e)

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of )  
Tennessee Valley Authority )

Docket Nos. 50-390  
50-391

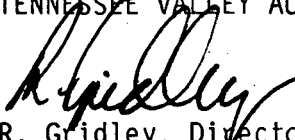
WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - QUESTIONABLE QUALIFICATION OF  
INSTALLED TYPE N RAYCHEM MATERIALS - WBRD-50-390/86-34 AND WBRD-50-391/86-31 -  
REVISED FINAL REPORT

The subject deficiency was initially reported to NRC Region II Inspector Bob Carroll on February 27, 1986, in accordance with 10 CFR 50.55(e) as Nonconformance Report (NCR) WBN 6623 for unit 1. NCR WBN 6774 documents this deficiency for unit 2. Our interim and final reports were submitted on March 31 and August 19, 1986. Enclosed is our revised final report. This report provides better justification for downgrading the deficiency to nonreportable under 10 CFR 50.55(e), as committed in TVA's response to violation 390, 391/87-13-01.

If there are any questions, please telephone G. R. Ashley at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
R. Gridley, Director  
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Regulatory Affairs

Enclosure  
cc: See page 2

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U.S. Nuclear Regulatory Commission

JUL 14 1988

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## ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2  
QUESTIONABLE QUALIFICATION OF INSTALLED TYPE N  
RAYCHEM MATERIALS  
WBRD-50-390/86-34 AND WBRD-50-391/86-31  
NONCONFORMANCE REPORTS WBN 6623 AND WBN 6774  
10 CFR 50.55(e)

### REVISED FINAL REPORT

#### DESCRIPTION OF DEFICIENCY

The requirements listed in Raychem's application guide for class 1E cable splices and terminations in harsh environment areas were incorporated into TVA standard drawings (SDs) and General Construction Specification G-38 in December 1985. Cable splicing and terminations using Raychem heat shrinkable breakouts, caps, and sleeving completed before this date do not meet these requirements. This condition is the result of the following:

- Cables spliced before December 1985 using heat shrinkable tubing had different application ranges than those presently required in a loss of coolant accident or high energy line break area.
- There was no requirement for use of an overall sleeve on the breakouts and end caps as currently shown on TVA standard drawing SD-E12.5.8.
- Raychem's design for their breakouts and end caps was changed in 1982. This change was not accounted for in applicable TVA design documents.
- Raychem's heat shrinkable sleeves for cable splicing were modified before December 1985 but had not been reflected in applicable TVA design documents.

#### SAFETY IMPLICATIONS

TVA has established that:

1. On July 31, 1986, TVA SD-E12.5.8 was revised to remove the oversleeve from detail C and to state that cable breakouts are not required for termination of multiconductor cables. The basis for this determination was a calculation titled "Instrument Cable Shield Grounds Due to Moisture in Harsh Environment," which concluded that instrumentation cable shields do not require additional protection from unintentional grounding by moisture during accident conditions. Since this calculation established that the cable breakout was not required for shielded multiconductor cables, installations which have cable breakouts installed would be acceptable in any configuration. Therefore, existing in-line splices or terminations that use a WCSF-N outer sleeve over the nuclear cable breakouts (NCB) are acceptable.

2. The low-voltage "V" type connection kit (NPKV) is made up using an NCB and a nuclear end cap (NEC). This is explicitly detailed in the NPKV kit instructions; therefore, low-voltage "V" type connections that use an NEC over the NCB are acceptable.
3. Sealing the end of the multiconductor cable jacket where the individual conductors exit the cable jacket is not a safety-related requirement but is considered to be a good construction practice. Based on the calculation discussed in paragraph one above, multiconductor cables with or without a Raychem NCB or with an NCB and Raychem WCSF-U oversleeve are acceptable.
4. Protecting the end of unterminated cables with a Raychem NEC is considered to be a good construction practice as indicated in note 21 on Electrical Standard Drawing SD-E12.5.1-1 R1, but is not a requirement since cables which are not terminated would not have any effect on nuclear safety. Unterminated cables with or without a Raychem NEC or with an NEC and a Raychem WCSF-U oversleeve are acceptable.

Raychem's present application range tables for the materials used by TVA are more liberal; therefore, the use of the previous tables is conservative, and therefore, acceptable.

Existing installations are acceptable, as described above. TVA, therefore, no longer considers this deficiency to be reportable under 10 CFR 50.55(e).