

**TENNESSEE VALLEY AUTHORITY**

CHATTANOOGA, TENNESSEE 37401  
5N 157B Lookout Place

February 27, 1986

WBRD-50-390/86-27  
WBRD-50-391/86-23

U.S. Nuclear Regulatory Commission  
Region II  
Attention: 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 - FLEXIBLE CONDUIT NOT INSTALLED TO  
COMPENSATE FOR THERMAL AND SEISMIC MOVEMENTS - WBRD-50-390/86-27,  
WBRD-50-391/86-23 - INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector  
Bob Carroll on January 14, 1986 in accordance with 10 CFR 50.55(e) as NCR WBN  
6529 for unit 1. NCR 6569 was later written to document the same deficiency  
for unit 2. Enclosed is our interim report. We expect to submit our next  
report on or about May 19, 1986.

Delay in submittal of this report was discussed with Mr. Carroll on  
January 28, 1986.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
R. L. Gridley  
Manager of Licensing

Enclosure

cc (Enclosure):

Mr. James Taylor, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Records Center  
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 FLEXIBLE CONDUIT NOT INSTALLED TO COMPENSATE FOR THERMAL AND SEISMIC MOVEMENTS

WBRD-50-390/86-27, WBRD-50-391/86-23

NCR WBN 6529 (UNIT 1)

NCR WBN 6569 (UNIT 2)

10 CFR 50.55(e) REPORT

INTERIM REPORT

#### Description of Deficiency

A sample of 100 flexible conduit installations was checked for adequate displacement provisions and lengths per the thermal consideration requirements of Table 3.2.6-1 in General Construction Specification G-40. The sample revealed that 69 percent of the conduits provided less than the minimum displacement required for thermal movement and 16 percent provided zero displacement. During evaluation of this deficiency, it was also identified that some of the samples included installations to floor-mounted class 1E equipment which requires installation provisions for seismic considerations, but not thermal.

The deficiency concerning conduits requiring installation provisions to allow for expansion resulted from the electrical drawings not identifying the flexible conduits that are part of a mechanical system designed for thermal movement and are thus subject to thermal considerations of General Construction Specification G-40. The deficiency concerning conduit requiring installation provisions to compensate for seismic movement occurred because some electrical drawings governing installation of class 1E floor-mounted equipment did not identify a requirement providing a minimum 1-inch displacement during installation. Consideration for the thermal/seismic displacements were not added to G-40 until October 21, 1980. At that time, the majority of the Watts Bar Nuclear Plant (WBN) flexible conduits were designed and installed.

TVA has subsequently issued nonconformance report (NCR) WBN 6569 to document a similar deficiency for installation of unit 2 flexible conduit. This NCR is included in this report.

#### Safety Implications

Flexible conduit for class 1E electrical devices on mechanical systems which require provisions for thermal movement and class 1E seismically qualified floor-mounted equipment which were installed with inadequate allowance to compensate for expansion or contraction could fail due to thermal/seismic movements. This condition could result in conductors becoming shorted due to moisture intrusion or breaking/pulling away from their terminal points consequently resulting in failure of the associated safety-related equipment to perform its designed functions. This condition could adversely affect the safe operations of the plant.

Interim Progress

TVA is in the process of reevaluating the requirements and specifications governing the relationship of flexible conduit to class 1E electrical devices on mechanical systems which require provisions for thermal movement and class 1E seismically qualified floor-mounted equipment. General Construction Specification G-40 will be revised to clarify the intent of various installations and requirements for displacement and minimum lengths. When investigations of class 1E flexible conduit installations are completed, the conduits with inadequate provisions for displacement will be reworked in accordance with the corrective action identified. TVA will provide the next report to the NRC on this condition on or about May 19, 1986.