

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

JUL 13 1987

WBRD-50-390/87-14  
WBRD-50-391/87-15

10 CFR 50.55(e)

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

Gentlemen:

WATTS BAR NUCLEAR PLANT (WBN) - UNITS 1 AND 2 - CONTAINMENT PURGE AIR SYSTEM  
BELLOWS HAVE NO FIRE RATING OR ENVIRONMENTAL QUALIFICATION - WBRD-50-390/87-14  
AND WBRD-50-391/87-15 - INTERIM REPORT

The subject deficiency was initially reported to NRC-Region II Inspector  
Bob Carroll on June 22, 1987, in accordance with 10 CFR 50.55(e)  
as SCRs WBN WBP 8777 and WBP 8790. Enclosed is our interim report. We  
expect to submit our next report on or about May 27, 1988.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*J. A. Romer*  
R. Gridley, Director  
Nuclear Safety and Licensing

Enclosure  
cc: See page 2

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cc (Enclosure):

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ENCLOSURE  
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2  
CONTAINMENT PURGE AIR SYSTEM BELLOWS HAVE NO  
FIRE RATING OR ENVIRONMENTAL QUALIFICATION  
WBRD-50-390/87-14 AND WBRD-50-391/87-15  
SCR WBN WBP 8777 AND SCR WBN WBP 8790  
10 CFR 50.55(e)  
INTERIM REPORT

Description of Deficiency

The heating, ventilating, and air conditioning (HVAC) ducts associated with the Containment Purge Air System have bellows expansion joints installed adjacent to the duct penetrations in the three-hour fire-rated Shield Building wall. These bellows joints have no fire resistive rating and there are no fire dampers installed at the duct penetrations. Fire Hazard Analysis Calculation FSG-CAM-022787 concluded that the three-hour fire barrier Shield Building wall would be breached if the expansion joints are exposed to fire. Fire would be supported by combustible materials such as oil, grease, charcoal, rubber, plastic, and electrical cables. Based on the amount of combustible material, propagation of a fire through the Shield Building wall is considered likely.

Also, the bellows expansion joints do not have documented environmental qualification for radiation. The synthetic material used in these bellows (Neoprene) begins to experience change in physical properties when subjected to radiation doses in the range of  $10^5$  rad. The integrated accident dose these bellows will experience is in the range of  $2.0 \times 10^6$  to  $1.2 \times 10^8$  rad. If this dose was combined with the accumulated 40-year normal integrated dose, the bellows could fail to perform its design function.

Safety Implications

The consequences of a failure of the subject expansion joints due to fire is possible exposure of redundant safe shutdown electrical circuits located on either side of the Shield Building wall. This exposure to fire could render the systems served by these circuits incapable of performing their intended safe shutdown design function.

Failure of the expansion joints due to high radiation levels would adversely affect the following safety-related functions: (a) Emergency Gas Treatment System maintaining negative one-half inch WG in the annulus when containment integrity is required, and (b) Auxiliary Building Gas Treatment System maintaining negative one-fourth inch WG in the Auxiliary Building secondary containment enclosure during accident conditions.

These conditions could adversely affect the safety of operations of the plant.

Interim Progress

TVA plans to perform an Appendix R and environmental qualification analysis for the subject deficiency. This analysis will determine what corrective actions should be taken to resolve the deficiency.

A final report detailing the corrective action, root cause, and recurrence control measures will be provided to NRC by May 27, 1988.