

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

1630 Chestnut Street Tower II

August 12, 1985

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WBRD-50-390/85-19
WBRD-50-391/85-18

U.S. Nuclear Regulatory Commission
Region II
Attn: 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 - FIRE-RATED PENETRATION ASSEMBLIES
DEFICIENCIES - WBRD-50-390/85-19 AND WBRD-50-391/85-18 - REVISED FINAL REPORT**

The subject deficiency was initially reported to NRC-OIE Inspector Al Ignatonis on June 25, 1985 in accordance with 10 CFR 50.55(e) as NCR W-235-P. This was followed by our final report dated July 26, 1985. Enclosed is our revised final report.

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY


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

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ENCLOSURE
WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
FIRE-RATED PENETRATION ASSEMBLIES DEFICIENCIES
WBRD-50-390/85-19, WBRD-50-391/85-18
NCR W-235-P
10 CFR 50.55(e)
REVISED FINAL REPORT

Description of Deficiency

During a walkdown inspection of Watts Bar Nuclear Plant (WBN), several fire-rated penetration assemblies were found to be deficient in the actual installed configuration. The deficient conditions found are as follows:

1. Penetrations were breached without an adequate tie to the work requiring its breaching.
2. Electrical penetrations and fire-stop assemblies were not sealed per TVA design drawings (45W833 series).

Subsequent investigations and walkdowns also revealed the following additional deficient conditions.

3. The thimble renewal sleeve through the reactor building shield wall was not provided with a fire-rated seal.
4. Heating, ventilating, and air-conditioning (HVAC) penetrations through the floor and ceiling of the entrance labyrinth of auxiliary building room 692.0-A31 are not protected by a three-hour fire-rated barrier.
5. TVA design drawings (47W240 series) did not reflect the latest compartmentation information.
6. Doors A36 and A38 in the auxiliary building needed repair to restore their fire endurance ratings. Door W4 in the intake pumping station (IPS) was not shown on architectural drawing 46W454-1 as a fire-rated door as required. However, visual inspection has confirmed that this door is an A-labeled fire door.

TVA has determined the assignable causes for the like-numbered deficient conditions to be as follows:

1. TVA's Office of Construction (OC) procedures for methods of breaching penetrations and the replacement of fire stop assemblies and documentation thereof were inadequate.
2. TVA design drawings which were used to define which electrical penetrations required sealing and the sealing methods to be used were not complete and required interpretation by personnel performing the tasks.

3. The flexible pipe from the thimble renewal sleeve to the steel containment vessel was removed on a design modification without the designer realizing that its removal resulted in a breach of a fire barrier.
4. TVA designers failed to recognize that the labyrinth was part of the three-hour fire compartment for room 692.0-A31.
5. The 47W240-series fire protection compartmentation drawings were reproduced from the SK-series fire protection compartmentation drawings. The SK-series drawings were updated as needed but the 47W240-series drawings were not. This resulted in two sets of fire protection compartmentation drawings which did not agree with each other.
6. Doors A36, A38, and W4 were not identified as fire doors on TVA architectural door schedule drawings. This was caused by an inadequate review of the fire protection compartmentation drawings.

Safety Implications

The subject deficiencies could allow the propagation of fire between designated fire areas (compartments) or could allow contaminated air to flow between designated pressurized areas. This could adversely affect the ability to achieve and maintain the safe shutdown of the plant in the event of a fire.

Corrective Action

The corrective actions taken for the like-numbered deficient conditions are as follows.

1. TVA has developed a more controllable method of handling the removal of penetration seals which assures that breached penetrations are properly resealed. This was accomplished by a revision of WBN Office of Construction (OC) Standard Operating Procedure (SOP) 42. This revision follows the requirements of the Office of Nuclear Power (NUC PR) physical security instruction PhySI-2 and will assure that the breached penetrations are properly documented and sealed.
2. TVA 45W883-series drawings have been revised to clearly define methods of sealing penetrations at fire barriers, as well as the pressure retention boundaries. This drawing series will refer to both the 47W240-series and the 46W501-series drawings to determine which electrical penetrations are to be sealed.
3. The TVA mechanical sleeve seal design drawings for WBN have been revised to add a fire-rated seal for the thimble renewal sleeves.
4. The affected TVA HVAC drawings have been revised to relocate the affected HVAC duct to outside the labyrinth area of room 692.0-A13. Affected TVA civil design drawings have been revised to provide a three-hour fire-rated barrier in the labyrinth.

5. TVA 47W240-series drawings have been revised to reflect the latest compartmentation information.
6. TVA design drawings 46W454-6 and -13 have been revised to modify doors A36 and A38. These modifications will restore the required fire endurance rating for these doors. Architectural drawing 46W454-1 has been revised to identify door W4 as an A-labeled fire door.

All drawing changes for the above deficiencies have been completed per TVA engineering change notices (ECNs) 5761 and 5762.

All WBN designers have been instructed to use the 47W240-series fire protection compartmentation drawings for design reviews of all modifications to existing systems. Also, the 47W240-series fire protection compartmentation drawings have been used to verify that all fire doors have been identified on TVA architectural door schedule drawings. TVA feels that the aforementioned corrective actions are adequate to prevent recurrence of these deficiencies.

TVA will complete all necessary modifications and rework for those deficiencies which have been identified per this item and will perform all necessary surveillance instructions (SIs) prior to initial criticality for WBN unit 1. All subsequent penetration breaches, after initial criticality is achieved, will be controlled administratively by Physical Security Instruction PhySI-2 and the requirements of WBN Technical Specification 3/4.7.12 will be met.