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**TENNESSEE VALLEY AUTHORITY**

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APR 27 1979

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USNRC REGION II  
ATLANTA, GEORGIA

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

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Dear Mr. O'Reilly:

OFFICE OF INSPECTION AND ENFORCEMENT BULLETIN 77-07 - IE:JPO 50-327,  
-328, -390, -391, -438, -439, -518, -519, -520, -521, -553, -554 -  
SEQUOYAH, HARTSVILLE, AND PHIPPS BEND NUCLEAR PLANTS - SUPPLEMENTAL REPORT

Enclosed is a supplemental report to OIE Bulletin 77-07, dated December 19, 1977, for Sequoyah, Hartsville, and Phipps Bend Nuclear Plants. Our initial response to OIE Bulletin 77-07 was submitted to you on January 20, 1978. This report provides additional information received from the manufacturer and describes TVA's plans in the area of electrical penetration. If you have any questions concerning this matter, please get in touch with Tish Jenkins at FTS 854-2014.

Very truly yours,

*J. E. Gilleland*  
J. E. Gilleland  
Assistant Manager of Power

Enclosure

cc: U.S. Nuclear Regulatory Commission (Enclosure)  
Office of Inspection and Enforcement  
Division of Reactor Construction Inspection  
Washington, DC 20555

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SUPPLEMENTAL REPORT TO IE BULLETIN 77-07  
DATED DECEMBER 19, 1977  
FROM J. P. O'REILLY TO GODWIN WILLIAMS, JR.

CONTAINMENT ELECTRICAL PENETRATIONS AT  
NUCLEAR PLANTS UNDER CONSTRUCTION  
(FOR SAFETY-RELATED SYSTEMS)

Our previous response, dated January 20, 1978, addressed Sequoyah, Watts Bar, Bellefonte, and Hartsville Nuclear Plants. This supplemental report provides additional information and clarification for the Sequoyah and Hartsville plants as well as an additional response for the Phipps Bend Nuclear Plant.

Question 1.0 - Do you have containment electrical penetrations that are of the G. E. Series 100, or are otherwise similar in that they depend upon an epoxy sealant and a dry nitrogen pressure environment to ensure that the electrical and pressure characteristics are maintained so as to ensure the functional capability as required by the plant's safety analysis report; namely, (1) to ensure adequate functioning of electrical safety-related equipment and (2) to ensure containment leak tightness? If you do use penetrations of this type at your facility describe the manufacturer and model number of these units.

Response

TVA does not utilize the GE series 100 containment electrical penetrations at either Sequoyah, Hartsville, or Phipps Bend Nuclear Plants. The manufacturer and types planned for use are described in the response to question 1.1. The penetrations are similar in that they depend on an epoxy sealant to maintain a pressure boundary. The penetrations are designed to function during and post-LOCA without requiring internal pressurization at LOCA pressure to ensure that electrical characteristics are maintained or to ensure containment leak tightness. However, TVA plans to adopt the manufacturer's recommendations to maintain nitrogen pressure in the penetrations as an additional design feature to prevent any possible degradation or functional capability because of possible accumulation of moisture within the penetration.

Question 1.1 - If you do not have penetration assemblies of the type(s) referenced in Item 1.0 above, describe the type(s) of penetrations e.g., manufacturer and model number now in use or planned for use in safety systems at your facility.

Sequoyah Nuclear Plant Units 1 and 2 (50-327 and 50-328)

The containment electrical penetrations for Sequoyah were manufactured by Westinghouse. The penetration model numbers planned for use in safety systems at Sequoyah are WX32198 through WX32212. The transition connector pins do not have an insulating jacket in the space used for monitoring leakage. In the seal area, the bare pins are embedded in epoxy. Penetration numbers WX32198, WX32199, WX32201 through WX32206 and WX32211 do not have epoxy seals.

Hartsville (Units A1, A2, B1, B2) and Phipps Bend (Units 1 and 2) Nuclear Plants

The containment electrical penetrations for Hartsville and Phipps Bend were manufactured by Westinghouse and utilize epoxy and glass seals. The penetration model numbers planned for use in safety systems are WX33436 through WX33446. The transition connector pins are coated with an insulation varnish to provide an insulating jacket in the space used for monitoring leakage. In the seal area, the bare pins are embedded in epoxy.

Question 1.2 - Do the transition connector pins imbedded in the epoxy as discussed in Item 1.0 above, have an insulation jacket?

Response

The design of the containment electrical penetrations for Sequoyah, Hartsville, and Phipps Bend do not utilize an insulation jacket over the conductors embedded in the epoxy seal.

Question 2.0 - For those penetrations referenced in Item 1 above, has the manufacturer's prescribed nitrogen pressure been maintained at all times during shipping, storage and installation?

Response

The manufacturer's recommendations have been followed for Sequoyah. The penetrations for Hartsville and Phipps Bend have not been manufactured. The manufacturer's recommendations for shipping, storage, and installation are described below:

- (1) The manufacturer ships the penetration pressurized with nitrogen.
- (2) During long-term storage and after installation the penetration should be inspected periodically and repressurized as required.

Question 3.0 - Is there a need, as determined by either the vendor or yourself, to maintain penetrations pressurized during normal operation, to assure functionality during a LOCA?

Response

Sequoyah Nuclear Plant

The Westinghouse penetrations are designed to function to ensure that electrical characteristics are maintained or to ensure containment leak tightness during and post-LOCA without requiring internal pressurization. However, as an added precaution, Westinghouse recommends that a common manifold system (refer to Figure 1) be utilized to keep the penetration under nitrogen pressure to prevent any possible degradation of functional capabilities. Each manifold system would usually be common to six electrical penetrations. The advantages of this system are as follows:

- (1) If a leak were to develop the nitrogen pressure would prevent moisture from entering the penetration and degrading the electrical insulation resistance.

- (2) The system can be used to keep the penetrations pressurized without requiring personnel to climb to difficult locations to inspect or repressurize penetrations.
- (3) Leak checking can be performed on a bank of penetrations at once. If leakage is excessive, individual leak checking can be performed by simply reducing the manifold pressure to zero. The check valves would then close and isolate each penetration for leak checking.

Hartsville and Phipps Bend Nuclear Plants

The Westinghouse penetrations are designed to function to ensure that electrical characteristics are maintained or to ensure containment leak tightness during and post-LOCA without requiring internal pressurization. However, as an added precaution, Westinghouse recommends that during normal operation the penetration should be kept under nitrogen pressure to prevent any possible degradation of functional capabilities. The penetrations are pressurized initially and will be inspected periodically and repressurized as required. TVA plans to pressurize the penetrations and to verify pressurization by periodic inspection.

Question 3.1 and 3.2 - Our previous response for Sequoyah and Hartsville is still applicable and applies also to the Phipps Bend Nuclear Plant.