

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

December 2, 1977

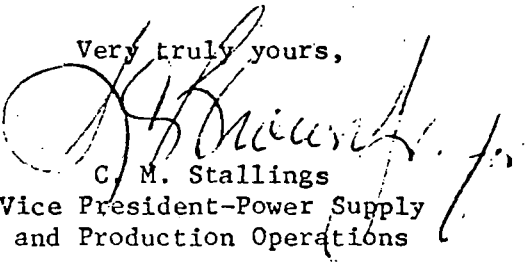
Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Region II - Suite 818
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

Serial No. 541/112277
PO&M/ALH:dgt
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Dear Mr. O'Reilly:

This is in response to IE Bulletin 77-06 which addressed certain problems with containment electrical penetration assemblies. Our oral responses to your questions were presented to Mr. Austin Hardin on November 23, 1977. The written responses are provided in the attachment to this letter.

Very truly yours,


C. M. Stallings
Vice President-Power Supply
and Production Operations

Attachment

cc: Mr. Robert W. Reid, Chief
Operating Reactors Branch 4

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VIRGINIA ELECTRIC AND POWER COMPANY
RESPONSES TO IE BULLETIN 77-06

NRC Comment

- 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?

Response

G. E. Series 100 containment electrical penetrations are not in use at Surry. At Surry, the penetration assemblies are manufactured by Amphenol Space and Missile Systems and CONAX Corporation. None of the penetration assemblies supplied by either of these firms rely on a nitrogen pressure to ensure functional capability. None of the penetration assemblies rely on an "epoxy" sealant but all use some type of molded material to provide a tight seal around the conductor, since leakage could compromise both containment integrity and electrical capability. These materials are as follows: RTV-8112, THIOKOI, and POLYSULFONE.

NRC Comment

- 1.1 Have you experienced any electrical failures with this type of penetration?

Response

Electrical failures of certain types of Amphenol penetration assemblies have occurred at Surry. This was reported to the Commission in USRE-S1-73-07. These failures were due to excessive heat generation in the pins when under electrical load. No failures have occurred as a result of a break down or deficiency in the sealing material.

NRC Comment

- 2.0 For those penetrations referenced in Item 1 above, have you maintained the manufacturer's prescribed nitrogen pressure at all times?

Response

Nitrogen pressure is not required to assure the functional capability of any of the penetrations at Surry. Each penetration is capable of being pressurized with nitrogen but only for leak detection purposes.

NRC Comment

- 2.1 If you have operated the penetrations without maintaining a nitrogen pressure was any degradation of insulation resistance or anomalous component operation detected?

Response

Same as response for Comment 2.0.

NRC Comment

- 2.2 If no measurements were taken during periods when nitrogen pressure was not maintained, how were you assured that the insulation resistance was not degrading or degraded?

Response

No equipment failures related to a breakdown of insulation resistance in containment penetrations has ever occurred at Surry.

NRC Comment

- 2.3 How do you determine that circuit insulation resistance values are satisfactorily maintained?

Response

All 480VAC and 4160VAC electrical loads that are fed through containment penetrations are checked for proper insulation resistance with a 500 VDC meggar during each refueling. Any degradation of insulation resistance in instrumentation circuits would be indicated by the periodic calibration checks done in accordance with Technical Specification Surveillance Requirements.

NRC Comments

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

Response

There is no need to maintain the penetrations pressurized during a LOCA. They are designed to operate without nitrogen pressure.

NRC Comment

- 3.1 What measures have you taken to ensure that penetrations of this type will perform their design function under LOCA condition?
(design reviews, analyses or tests)

Response

The Amphenol penetration electrical connectors were tested by D.G. O'Brien, Inc. in 1972. The purpose of this test was to demonstrate operability during simulated LOCA conditions. The D.G. O'Brien report stated in summary: "The connector assembly passed the test with no less than 34 megohms internal resistance while retaining complete electrical continuity. The test had no observable physical effect on the connector assembly or cable." Since no connectors are associated with the CONAX type penetration, no specific tests were performed. However, CONAX corporation has provided detailed data regarding the performance of

the materials used in CONAX penetrations. This information includes thermal performance, radiation resistance, and chemical resistance tests. All data indicates excellent performance characteristics for a LOCA environment.

NRC Comment

- 3.2 Are the measures that provide this assurance adequate to satisfy the Commission's regulations (GDC 4, Appendix A to Part 50; QA Criteria, Appendix B to Part 50)

Response

We believe that adequate assurance exists to satisfy the commissions regulations. Compliance with design criteria is discussed in section 1.4 of the Surry FSAR.