*Southern California Edison Company*

P. O. BOX 800

2244 WALNUT GROVE AVENUE

ROSEMEAD, CALIFORNIA 91770

J. T. HEAD, JR.
VICE PRESIDENT

TELEPHONE
213-572-1472

December 2, 1977

U. S. Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1990 North California Boulevard
Walnut Creek, California 94596

Attention: R. H. Engelken, Director

Docket No. 50-206
San Onofre Unit 1

Dear Sir:

IE Bulletin No. 77-06
Potential Problems with
Containment Electrical
Penetration Assemblies

Reference is made to your correspondence of November 22, 1977, forwarding the subject IE Bulletin. Identified therein were potential problems with containment penetration assemblies that are G. E. Series 100 or a similar type. This letter documents the results of our investigation in response to the subject Bulletin.

Two types of containment penetrations are presently installed at San Onofre Unit 1.

(1) Viking Industries Sealed Canister Penetrations (Total of 24)

These are not similar to G. E. Series 100 in that internal nitrogen pressure is not required and no path exists for moisture laden air to enter the canister.

(2) Amphenol-Sam Epoxy "Pancake" Penetrations (Total of 3)

These appear to be similar to G. E. Series 100 in that they depend on an epoxy seal and contain a nitrogen pressure environment. The design of these penetrations has been qualified in accordance with the requirements of IEEE 317-1976 with the exception of the minimum qualified lifetime. However, we are in the process of obtaining documentation to support a qualified lifetime of 35 years. The penetrations have operated satisfactorily since initial installation (September, 1976) in conjunction with backfit modifications.

Individual responses to the questions posed in the Bulletin are provided in the attachment to this letter. Based upon our investigation, it is concluded that problems similar to those identified in the subject Bulletin will not occur at San Onofre Unit 1.

Should you have any further questions, please contact me.

Sincerely,

Attachment

cc: U. S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Division of Reactor Operations Inspection

ATTACHMENT

RESPONSE TO QUESTIONS LISTED IN IE BULLETIN 77-06

CONTAINMENT PENETRATION ASSEMBLIES

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?

Response

Two types of penetrations are installed at San Onofre Unit 1.

1. Viking Industries Sealed Canister Penetrations

Conductor entry and exit of the penetration assembly is accomplished using connecting pins running through the inner and outer steel faces of the assembly. Prior to installation, the assemblies were leak checked with dry helium and subsequently sealed so that inside pressure is not monitored nor is a path available for entry of outside air. This type of penetration is not similar to the G.E. 100 Series because (1) internal nitrogen pressure is not required and (2) no path exists for moisture laden air to enter the canister.

2. Amphenol - Sams Epoxy "Pancake" Penetrations

Conductor entry and exit of these penetration assemblies is accomplished using connecting pins running through the inner and outer steel faces of the assembly. An insulated conductor running the length of the assembly is crimped to the pins on each end. A high alumina potting compound surrounds the connecting pins and crimp joints inside and outside the penetration assembly and provides both electrical and environmental insulation. A two-inch cavity in the center of the assembly does not contain potting mix, but is pressurized with dry nitrogen and the pressure monitored with an external gauge. This pressurized nitrogen environment was provided as a means for detecting leakage from the containment sphere to atmosphere through the penetration piece.

It appears that this penetration is similar to the G.E. Series 100 in that (1) it depends on an epoxy seal and (2) contains a nitrogen pressure environment. Therefore the responses to the remaining questions relate to the Amphenol-Sams penetrations only.

Question 1.1

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

Response

No electrical failures of the Amphenol penetrations have been experienced since installation during our September 1976 refueling outage.

Question 2.0

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

Response

The Amphenol penetrations have been pressurized in accordance with manufacturer's instructions continuously during shipping, installation, and operation.

Question 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

Not Applicable

Question 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

Not Applicable

Question 2.3

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

Response

Either an operability or insulation resistance check is performed at refueling outage intervals and after significant maintenance on equipment served by the penetration assembly.

Question 3.0

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

Response

The design of these assemblies does not require that they be pressurized during a LOCA.

Question 3.1

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

Response

The penetrations have been qualified for LOCA conditions in accordance with IEEE 317-1976 with the exception of the minimum qualified lifetime. However, additional testing and calculations have been performed which support a design life of 35 years. These documents will be reviewed and verified upon receipt from the manufacturer.

Question 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

It is our position that these measures provide adequate assurance that the penetrations will perform their design function under LOCA conditions.