CENTRAL FILES

METROPOLITAN EDISON COMPANY SUBSIDIARY OF GENERAL PUBLIC UTILITIES CORPORATION

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January 20, 1978
GQL 0115

Mr. B. H. Grier, Director
U. S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Sir:

Three Mile Island Nuclear Station Unit 2
License No. CPPR-66
Docket No. 50-320
Evaluation of Containment Electrical Penetrations
IE Bulletin No. 77-07 Dated December 19, 1977

In response to IE Bulletin No. 77-07 dated December 19, 1977 in which events and circumstances at Millstone 2 were described which caused the failure of electrical equipment in safety related circuits due to moisture within containment electrical penetration assemblies, please be advised of the following:

Our comments to the requested action in Items 1.0 through 3.2 as stated in IE Bulletin No. 77-07 are listed below in their respective order.

1.0 The General Electric Series 100 containment electrical penetration assembly is not used at our facility. The TMI-2 containment electrical penetration assemblies described below have improved electrical terminations and mechanical seals (1) to ensure adequate functioning of electrical safety related equipment and (2) to ensure containment leak tightness.

1.1 All containment electrical penetration assemblies installed at our facility were supplied by the manufacturer General Electric of San Jose, California. The assemblies are identified below as to service and type number.

Quantity	Service	Assembly P.L. & Assembly No.
5	Neutron Monitoring Signals	238X601MAG1-G4 136B2601
8	Instrumentation & Control	238X607MAG1-G3 136B2602
10	Low Voltage Power	238X604MAG1-G4 136B2604

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Quantity	Service	Assembly P.L. & Assembly No.
4	Thermocouple	238X605MAG1-G4 136B2605
9	Low Voltage Power	238X606MAG2-G4 135B2606
9	High Voltage Power	328X[illegible]97MAG1 163C1315

The basic design is the same for all penetration types. The electrical conductors are insulated and pass through header plates at both ends of the penetration. The conductors are sealed in cast epoxy with the epoxy on the inner sides of the header plates.

The low voltage power electrical penetration assemblies G3 and G4 have a double seal on each end of the penetration. They are designed for assembly in a penetration nozzle made of U.S. Standard 14 inch schedule 80 steel pipe.

The high voltage power assemblies have a double seal along each conductor and a double seal for monitoring each weld on the header assembly. The high voltage power assemblies are designed for assembly in a penetration nozzle made of 26 inch schedule 80 steel pipe.

All assemblies are supplied with junction boxes on each end of the penetration to facilitate the interface between penetration seals and the plant wiring.

1.2 The spliced conductors are terminated by a non-insulated crimped lug in cast epoxy located in the inner side of the double header penetration seal. It has been demonstrated by the tests noted in Item 3.1 and 3.2 that the conductor terminations and penetration seals meet the requirements for their intended function.

2.0 The manufacturer, General Electric, (G.E.) has no prescribed pressurization of the containment electrical penetration assemblies during shipping and storage. However, after the installation of the electrical penetration assemblies the G.E. installation manual prescribes a nitrogen pressure of 15 psig during plant operation.

3.0 After installation, the electrical penetration assemblies were pressurized at approximately 56 psi; for a period of 24 hours to assure the integrity of the electrical penetration seals.

The electrical penetration assemblies are to be pressurized as described in the TMI-2 FSAR, Section 6.2.4.2 during all phases of operation.

3.1 The measures taken to assure that the containment electrical penetration assemblies will perform their design functions under LOCA conditions are as follows:

a. All electrical penetration assemblies were factory tested for integrity and electrical quality before shipping. The

The tests performed included a helium leakage test for integrity of the welds, and electrical insulation resistance and dielectric strength and short time overload tests.

b. Prior to installation, insulation resistance checks were made on all high voltage power penetration circuits and all neutron monitoring penetration circuits.

c. After completing the installation of the electrical penetration assemblies, all conductors within each assembly were checked for insulation resistance between conductors and conductor to frame ground.

d. All penetrations were pressure tested as noted in Item 3.0.

e. QC surveillance documented the tests performed.

3.2 The noted tests performed in Item 3.1 including the QC surveillance and the LOCA tests performed independently on the electrical penetration assemblies which were successfully passed as reported by the manufacturer, General Electric, satisfies the General Design Criteria for Appendix A to Part 50 (GDC4) and Appendix B to Part 50 (QA Criteria).

We trust that we have addressed any concern that you may have had by our response to the above subject.

Sincerely,

J. G. Herbein
Vice President Generation

JGH:JRS:tas

cc: Dr. Ernst Volgenau, Director
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