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IEEE Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations

IEEE Power and Energy Society

Sponsored by the
Nuclear Power Engineering Committee

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USA

IEEE Std 317™-2013
(Revision of IEEE Std 317-1983)

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Abstract: An electric penetration assembly is an assembly of insulated electric conductors, conductor seals, module seals (if any), and aperture seals that provides the passage of the electric conductors through a single aperture in the nuclear containment structure, while providing a pressure barrier between the inside and the outside of the containment structure. The electric penetration assembly includes terminal (junction) boxes, terminal blocks, connectors and cable supports, and splices which are designed and furnished as an integral part of the assembly. Requirements for the design, construction, qualification, test, and installation of electric penetration assemblies in nuclear containment structures for stationary nuclear power generating stations are prescribed in this standard.

Criteria intended to facilitate the determination of the features of design, construction, test, qualification, and installation relative to the electric penetration assemblies of primary containments of the nuclear facilities that comply with the United States Nuclear Regulatory Commission's Code of Federal Regulations (10CFR50) are presented in this standard.

Keywords: aperture seals, class MC components, conductor seals, containment electric penetration assembly, containment penetrations, control power penetrations, DBE, design basis events, electric penetration assembly, electrical penetration assembly, fiber seals, IEEE 317™, instrumentation penetrations, low voltage power penetrations, LVP, medium voltage power penetrations, module seals, MVP, penetration feedthroughs, penetration modules, qualified life, SAC, severe accident conditions

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Introduction

This introduction is not part of IEEE Std 317™-2013, IEEE Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations.

This standard presents criteria to facilitate the determination of the features of design, construction, test, qualification, and installation relative to the electric penetration assemblies of primary containments of the nuclear facilities that comply with the United States Nuclear Regulatory Commission's Code of Federal Regulations (10CFR50).

Adherence to these criteria alone may not suffice for ensuring the health and safety of the public because it is the integrated performance of the structures, the fluid systems, the instrumentation, and the electric systems of the stations that establishes the consequences of accidents. Each applicant has the responsibility to assure himself and others that this integrated performance is adequate.

The IEEE will maintain this standard current with the state of the technology. Comments on this standard and suggestions for additional material that should be included are invited.

Contents

IEEE Standard for Electric Penetration Assemblies in Containment Structures for Nuclear Power Generating Stations

1. Overview

1.1 Scope

This standard prescribes the requirements for the design, construction, qualification, test, and installation of electric penetration assemblies in nuclear containment structures for stationary nuclear power generating stations. The requirements for external circuits that connect to penetration assemblies are beyond the scope of this standard. This standard does not include requirements for operation, maintenance, or periodic testing after installation.

1.2 Purpose

This standard presents criteria to facilitate the determination of the features of design, construction, test, qualification, and installation relative to the electric penetration assemblies of primary containments of nuclear facilities.