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IEEE Standard Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations

STANDARDS

IEEE Power and Energy Society

Developed by the
Nuclear Power Engineering Committee

IEEE Std 628™-2020
(Revision of IEEE Std 628-2011)

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Abstract: Criteria for the minimum requirements in the selection design, installation, and qualification of raceway systems for Class 1E circuits for nuclear power generating stations are provided in this standard. Methods for the structural qualification of raceway systems for Class 1E circuits are also prescribed.

Keywords: cable tray, conduit, design-by-rule, duct line, IEEE 628™, raceways, seismic

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3 Park Avenue, New York, NY 10016-5997, USA

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Gene Poletto, *Chair*
Ken Netzel, *Vice Chair*

Keith B. Bush
Dale Goodney
Jinsuk Lee
Scott Sweat

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Kenneth Miller, *Chair*
Mitch Staskiewicz, *Vice Chair*

Audrey Baricko
Jason Bellamy
Mark Bowman
Keith Bush
John Disosway
Nader Eldeiry
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Masashi Sugiyama
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Introduction

This introduction is not part of IEEE Std 628-2020, IEEE Standard for Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations.

The original document was issued in 1987 and reaffirmed in 1992. During the reaffirmation process, it was agreed to add earthquake experience data as an acceptable method of performing seismic qualification for raceway systems in the next revision of the standard.

The 2001 revision of this standard incorporated methods developed by the Seismic Qualification Users Group (SQUG) for verification of the seismic adequacy of cable tray systems at older nuclear power plants. These methods were approved by the US Nuclear Regulatory Commission (NRC) for plants that were licensed prior to IEEE Std 344™-1975 [B5].[1] Other changes made to the standard were format changes and upgrading document references. The definitions contained in the original and reaffirmed documents were removed as they are now contained in The IEEE Standards Dictionary: Glossary of Terms and Definitions.[2] The working group also discussed the use of the term Safety Class in place of the term Class 1E. The working group felt that the definition and usage of these terms were established in IEEE Std 308™ [B4], and this standard should conform to the established criteria. Therefore, use of the term Class 1E was maintained.

In 2006, the standard was again reaffirmed.

The 2011 revision updated references and addressed comments received during the 2006 reaffirmation process. In general, the readability of the standard was improved by clarifying wording, making editorial corrections, and improving the legibility of the figures in Annex D. In addition, minor changes were made to reflect input based on review of newer reactor design certification documents.

This revision is a general update of the standard and incorporates changes to reflect current state of the industry. Annex D, Criteria and guidance for seismic-experience-based qualification, and associated subclause 5.4 and references were removed. This qualification method is not intended for new nuclear power plant designs; however, older nuclear power plants may continue to use experience-based qualification methods and reference earlier versions of this standard as applicable. In addition, new subclause 4.11 was added to address EMC/EMI shielding.

[1]The numbers in brackets correspond to those of the bibliography in Annex A.
[2]IEEE Standards Dictionary Online is available at: http://dictionary.ieee.org. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

Contents

IEEE Standard Criteria for the Design, Installation, and Qualification of Raceway Systems for Class 1E Circuits for Nuclear Power Generating Stations

1. Overview

1.1 Scope

This standard contains the requirements for the design, installation, and qualification of raceway systems for Class 1E circuits external to electric equipment and components for nuclear power generating stations. Because aging and radiation have no known detrimental effects on metallic raceway systems and because nonmetallic raceway systems are limited to underground or embedded applications, aging and radiation are not considered in this standard. The embedments or structural members to which a support is attached are beyond the scope of this standard.

1.2 Purpose

The purpose of this standard is to provide criteria for the minimum requirements in the selection, design, installation, and qualification of raceway systems for Class 1E circuits for nuclear power generating stations. It also prescribes methods for the structural qualification of raceway systems for Class 1E circuits.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ACI 349/349R, Code Requirements for Nuclear Safety-related Concrete Structures and Commentary.[3]

ANSI C80.1, American National Standard for Electrical Rigid Steel Conduit (ERSC).[4]

ANSI C80.3, American National Standard for Steel Electrical Metallic Tubing (EMT).

[3]ACI publications are available from the American Concrete Institute (http://www.concrete.org/).
[4]ANSI publications are available from the American National Standards Institute (http://www.ansi.org/).