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IEEE Standard for Qualifying Electric Cables and Splices for Nuclear Facilities

IEEE Power and Energy Society

Sponsored by the
Nuclear Power Engineering Committee

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

IEEE Std 383™-2015
(Revision of
IEEE Std 383-2003)

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Abstract: General requirements and methods for qualifying electric cables and splices for nuclear facilities are provided. Cable, wire, and splices within or integral to other devices (e.g., instruments, panels, motors) should be qualified using the requirements in the applicable device standard or IEEE Std 323™. However, this standard's requirements may be applied to the cable, wire and splices within these devices. For qualification of fiber optic cable, refer to IEEE Std 1682™.

Keywords: cable, electric cable, factory rework, factory splice, IEEE 383™, nuclear facility, qualified life, representative cable, representative splice, Class 1E, splice, wire

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Introduction

This introduction is not part of IEEE Std 383™-2015, IEEE Standard for Qualifying Electric Cables and Splices for Nuclear Facilities.

This standard was undertaken as part of the normal IEEE review policy of existing standards. The purpose of this revision is to provide greater guidance for cable and splice qualification and to clarify the existing principles of qualification provided by IEEE Std 323™-2003. It is not the intent of this revision that cables and splices qualified to previous editions of this or other standards are requalified to this revision.

This revision includes the following changes:

- Title, scope, and purpose were updated and simplified.
- "Class 1E" was deleted from the title.
- "Nuclear facilities" is defined as a broader term that encompasses nuclear power generating stations.
- "Field splice" was changed to "splice."
- The definitions of "representative cable" and "representative splice" were revised, and similar changes made in the body of the document.
- The assumption that insulation and jacket is thermoset was clarified.
- The requirment that the reasoning for choice of colors tested shall be documented was added.
- It is noted that separate power cable sample(s) may be needed.
- A normal service test was added in Clause 7.
- Long-term water test methods were added for low-voltage and medium-voltage cables.
- The guidance on flame testing was updated to be clearer that singles need to pass a flame test as well as the completed cable. Aged flame testing is also included. Information on flame testing when jacket colors change was added.
- Reference to an optional circuit integrity test method is added.
- Annex B was added with additional information on modifications.
- Additional information was added on aging. This information is from other IEEE standards and has always been required, but it may have been missed by users of earlier versions. Therefore, it is now highlighted in this standard.
- Information on aging in an inert atmosphere was deleted because it may be misinterpreted.
- Additional documentation requirements were added.
- Clarifications and other updates were made.

The following information was not added in this revision but will be considered for a future revision:

- Information on condition monitoring.
- How to handle high-beta radiation.
- Jacket sump issues as they pertain to qualification.
- Splices and cables being qualified together as a system.

Contents

IEEE Standard for Qualifying Electric Cables and Splices for Nuclear Facilities

1. Overview

1.1 Scope

This standard provides general requirements and methods for qualifying electric cables, and splices for nuclear facilities. Cable, wire, and splices within or integral to other devices (e.g., instruments, panels, motors) should be qualified using the requirements in the applicable device standard or IEEE Std 323™-2003. However, this standard's requirements may be applied to the cable, wire, and splices within these devices. For qualification of fiber optic cable refer to IEEE Std 1682™.

1.2 Purpose

The purpose of this standard is to provide standard methodology for the implementation of IEEE Std 323-2003 as it pertains to the qualification of electrical cables and splices.

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.