



## Nuclear Rated Cable Qualification

The industry reference document for qualifying cable is IEEE 383-2003 titled "IEEE Standard for Qualifying Class 1E Electric Cables and Field Splices for Nuclear Power Generating Stations". The 2003 edition is a revision of the 1974 edition.

Paragraph 4 from IEEE 383-2003, titled "Principle Qualification Criteria" is repeated below.

*"It is required that Class 1E cable and field splices meet or exceed specified performance requirements throughout their installed life. This is accomplished, in part, by ensuring the cables are manufactured in accordance with applicable industry standards (as defined in Clause 7) and that cables and field splices are subjected to quality assurance programs that include, but are not limited to, design, qualification, and production quality control.*

*It is the role of qualification to ensure that Class 1E cable and field splices can be demonstrated to perform as specified and that no failure mechanism exists that could lead to common cause failures under postulated service conditions.*

*It is the degradation with time (aging), followed by exposure to the environmental extremes of temperature, pressure, humidity, radiation, mechanical stress, or chemical spray or a combination of these resulting from design basis events (DBE's), which present a potential for common cause failures of Class 1E cable and field splices. For these reasons, it is necessary to establish a qualified life for cables and field splices required to function during and following DBE's, which subject the cables and field splices to DBE environments that exceed their normal and abnormal levels. This shall be accomplished using the qualification methods described in the following sections of this standard, including type testing, operating experience, analysis as a supplement to type testing and operating experience, ongoing qualifications, or any combination thereof."*

The details of the test program and the analysis of the data are the responsibility of the cable manufacturer. The goal is to demonstrate by analysis the data for both a 40 year and 60 year design life.

The test program includes:

- In house development of Insulation Compound and cable jacket compound
- Thermal Aging - 3 weeks at 150°C
- Radiation Aging - 200 megarads
- Design Basis Event Profile per IEEE 383
- Flame Testing - thermally aged and IEEE 1202 tested
- Life Projection - 40 Yr and 60 Yr analysis

The Okonite Company continues to be the leader specializing in custom formulated EPR insulations capable of complying with the Class 1E test program and demonstration by audit of Company systems supporting the nuclear product line. Okonite's complete Class 1E product line was re-qualified in 2005; instrumentation, low voltage power and control and medium voltage.

Please contact the Okonite representative nearest your location for the latest test reports and product information for:

Class 1E Instrumentation Cable

Class 1E Low Voltage Power & Control Cable

Class 1E Medium Voltage Cable.

J. V. Fitzgerald

**ISO 9000-1994 CERTIFIED**



**THE OKONITE COMPANY**

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