PERFORMANCE BASED STANDARD FOR ELECTRIC UTILITY EXTRUDED DIELECTRIC SHIELDED POWER CABLES RATED 5 THROUGH 46 KV

ANSI/ICEA S-113-684-2016

INSULATED CABLE ENGINEERS ASSOCIATION, Inc.

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FOREWORD

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Requests for interpretation of this Standard must be submitted in writing to the Insulated Cable Engineers Association, Inc., www.icea.net. An official written interpretation will be provided. Suggestions for improvements gained in the use of this Standard will be welcomed by the Association.

The ICEA expresses thanks to the Association of Edison Illuminating Companies for providing the basis for some of the material included herein through their participation in the Utility Power Cable Standards Technical Advisory Committee (UPCSTAC), and to the Institute of Electrical and Electronics Engineers, Insulated Conductors Committee, Task Group 2-14 Balloting Group for providing user input to this Standard.

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Part 1
GENERAL

1.1 SCOPE

This standard provides the basis for designing non-traditional shielded power cables that will be rated 5 to 46 kV and be used for the transmission and distribution of electrical energy. These non-traditional cables will normally have overall diameters that are less than the diameters of what are considered traditional shielded power cables as specified in ICEA Standards S-94-649 and S-97-682. This standard is not intended to promote standardization of cable component thicknesses or dimensions. The smaller overall diameters are accomplished by reducing the wall thicknesses of the various polymer and metallic layers of the cable. As the polymer layer thicknesses are reduced, the electrical stress in the cable may increase. Manufacturers will design their cables based on what they have determined to be the maximum acceptable electrical stress levels that will not adversely affect their cable's performance. Since performance based designs can vary from manufacturer to manufacturer, the user of this standard must evaluate non-traditional cable designs very carefully. Additionally, the user of this standard must consider the impact performance based cable designs will have on cable accessories.

Note: See Appendix K for cable insulations qualification requirements or cable design features appropriate for submerged applications.

1.2 GENERAL INFORMATION

This publication is so arranged to allow selection from two design concepts, one known as "DISCHARGE-FREE" and the other as "DISCHARGE-RESISTANT", as well as allowing for selection of those individual components (such as conductors, insulation type and thickness, metallic shield type, jackets, etc.) as required for specific installation and service conditions.

Parts 2 to 7 cover the major components of cables:

Part 2 - Conductor
Part 3 - Conductor Shield
Part 4 - Insulation
Part 5 - Insulation Shield
Part 6 - Metallic Shielding
Part 7 - Jacket

Each of these parts designates the material characteristics, performance characteristics, dimensions, and tests applicable to the particular component and, as applicable, to the design concept.

Part 8 covers the assembly and identification of cables.
Part 9 covers production test procedures applicable to cable component materials and to completed cables.
Part 10 covers qualification test procedures.
Part 11 contains appendices of pertinent information.

U.S. customary units, except for temperature and electrical stress, are specified throughout this standard. Approximate International System of Units (SI) equivalents are included for information only.

1.3 INFORMATION TO BE SUPPLIED BY PURCHASER

When requesting proposals from cable manufacturers, the prospective purchaser should describe the cable desired by reference to pertinent provisions of these standards. To help avoid misunderstandings and possible misapplication of the cables, the purchaser should also furnish the following information: