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IEEE Guide for Field Testing of Laminated Dielectric, Shielded AC Power Cable Systems Rated 5 kV to 500 kV Using High Voltage Direct Current (HVDC)

IEEE Power and Energy Society

Sponsored by the
Insulated Conductors Committee

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USA

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Abstract: The recommended practices and procedures for direct voltage acceptance and maintenance testing of shielded, laminated, dielectric-insulated power cable systems rated 5 kV to 500 kV are presented in this guide. It applies to all types of laminated power cable systems such as paper insulated, lead covered, pipe-type, and pressurized cables that are intended for the transmission or distribution of ac electric power. The tabulated test levels assume that the cable systems have an effectively grounded neutral system or a grounded metallic shield.

Keywords: cable, cable installation, cable maintenance, cable tests, field test procedures, HVDC tests, IEEE 400.1™, insulated cable, power cable systems, shielded power cable systems

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Introduction

This introduction is not part of IEEE Std 400.1-2018, IEEE Guide for Field Testing of Laminated Dielectric, Shielded AC Power Cable Systems Rated 5 kV to 500kV Using High Voltage Direct Current (HVDC).

To say that there is a marked difference of opinion on the matter of cable testing would be a decided understatement. Many users, particularly utilities, while practicing acceptance testing, do not favor maintenance testing or testing after cable systems have been in service, believing that such tests may shorten cable life. A few utility users, and many industrial users, favor both acceptance and maintenance testing, believing that such testing will contribute to improved service reliability. Others feel that either acceptance or maintenance testing can cause cable damage, resulting in premature failures and customer dissatisfaction. Annex C of this guide gives additional background and more detailed commentary on these attitudes and philosophies. There is undoubtedly much to be said both for and against all viewpoints; only the individual user can determine whether, how frequently, and at what stresses testing is to be conducted.

In short, this guide does not suggest that cable-system testing be done; it simply provides guidance for such testing, developed by those who have found it useful. Additionally, it provides interpretive information based on many years of experience. Finally, pervading the entire procedure, safety has been a constant consideration in each step of the recommended practices. It is hoped that use of this guide will increase the sum of knowledge on the subject and result in more meaningful testing procedures and methods.

Suggestions for improvements to this guide are welcome. They should be sent to the Secretary, IEEE-SA Standards Board, 445 Hoes Lane, Piscataway, NJ 08854, USA.

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