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IEEE Guide for Conducting Corona Tests on Hardware for Overhead Transmission Lines and Substations

IEEE Power and Energy Society

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IEEE Std 1829™-2017

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Approved 14 February 2017

IEEE-SA Standards Board

Abstract: Uniform procedures for the testing of transmission line and station bus hardware in high voltage laboratories are established in this guide. Two tests are described: the first is a visual corona test, the second is a radio interference voltage (RIV) test. This guide does not address the permissible radio interference (RI) limits or specified corona extinction voltages. They are set either by regulation or by agreement between the utility and hardware manufacturer.

Keywords: corona, hardware, IEEE Std 1829™, RIV, testing, visual corona

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

PDF: ISBN 978-1-5044-3747-9 STD22425
Print: ISBN 978-1-5044-3748-6 STDPD22425

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Introduction

This introduction is not part of IEEE Std 1829-2017, IEEE Guide for Conducting Corona Tests on Hardware for Overhead Transmission Lines and Substations.

The IEEE Corona and Fields Effects Working Group determined the need for a consistent process for performing corona tests on hardware used on overhead transmission lines and in substations. This guide combines typical industry practice from many sources to provide this guidance on a proper process without setting compliance limits.

Acknowledgement

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IEEE Guide for Conducting Corona Tests on Hardware for Overhead Transmission Lines and Substations

1. Overview

1.1 Scope

This guide establishes uniform procedures for the testing of transmission line and station bus hardware in high voltage laboratories. Two tests are described. The first one is a corona performance test. The second is a radio interference voltage (RIV) test. The first test uses visible techniques to determine the onset of positive corona. The second test is a measurement of the RIV voltage according to ANSI C63.2 or CISPR 16-1-1 and CISPR 18-2: 2010. This guide does not address the permissible radio interference (RI) limits or specified corona extinction voltages. They are set either by regulation or by agreement between the end user and hardware manufacturer.

1.2 Purpose

The purpose of this guide is to establish uniform procedures for the testing of transmission line and station bus hardware in high voltage laboratories. A uniform procedure is a prerequisite to assure such hardware is either free from visible corona or does not add any appreciable RI to that already being generated by the transmission line or substation conductors.

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.

ANSI C63.2, American National Standard for Electromagnetic Noise and Field Strength Instrumentation, 0 Hz to 40 GHz Specifications.[1]

CISPR 16-1-1, Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods —Part 1–1: Radio Disturbance and Immunity Measuring Apparatus—Measuring Apparatus.[2]

CISPR 18-2: 2010, Radio Interference Characteristics of Overhead Power Lines and High-Voltage Equipment —Part 2: Methods of Measurement and Procedure for Determining Limits.

[1]ANSI publications are available from the American National Standards Institute (http://www.ansi.org/).
[2]CISPR documents are available from the International Electrotechnical Commission (http://www.iec.ch/).