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IEEE Standard for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines

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IEEE Power and Energy Society

Developed by the
Transmission and Distribution Committee

IEEE Std 644™-2019
(Revision of IEEE Std 644-2008)

IEEE

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IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines

Developed by the

Transmission and Distribution Committee
of the
IEEE Power and Energy Society

Approved 7 November 2019

IEEE SA Standards Board

Abstract: Uniform procedures for the measurement of power frequency electric and magnetic fields from alternating current (ac) overhead power lines and for the calibration of the meters used in these measurements are established in this standard. The procedures apply to the measurement of electric and magnetic fields close to ground level. The procedures can also be tentatively applied (with limitations, as specified in the standard) to electric fields near an energized conductor or structure.

Keywords: ac power lines, electric field, IEEE 644™, magnetic field, measurement

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Introduction

This introduction is not part of IEEE Std 644-2019, IEEE Standard for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines.

This standard is a revision of IEEE Std 644™-2008 (a reaffirmation of IEEE Std 644-1994), which establishes uniform procedures for measuring power frequency electric and magnetic fields in the vicinity of ac power lines. The following revisions have been made and are intended to improve the usefulness of the document:

a) Text and revisions to some figures have been introduced to address the increasing likelihood that transmission lines are constructed on multi-line rights-of-way. Selection of measurement locations and extent of measurements have been altered accordingly.

b) Text (with appropriate bibliographical references) has been added to note that electro-optic meters are available for performing some electric field measurements.

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IEEE Standard for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines

1. Overview

1.1 Scope

This standard establishes uniform procedures for the measurement of power frequency electric and magnetic fields from alternating current (ac) overhead power lines and for the calibration of the meters used in these measurements. A uniform procedure is a prerequisite to comparisons of electric and magnetic fields of various ac overhead power lines. These procedures apply to the measurement of electric and magnetic fields close to ground level. They can also be tentatively applied to electric field measurements near an energized conductor or structure with the limitations outlined in 3.5.

1.2 Purpose

The purpose of this standard is to establish uniform procedures for the measurement of electric and magnetic field levels from overhead ac power lines, and to establish calibration procedures for the meters used in these measurements. A uniform measurement procedure with established instrumentation and calibration is a prerequisite to comparisons or validation, or both, of the electric and magnetic field strength associated with various overhead power lines.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[1,2]

[1] The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.
[2] The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.