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IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations

IEEE Power and Energy Society

Sponsored by the
Transmission and Distribution Committee

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3 Park Avenue
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USA

IEEE Std 430™-2017
(Revision of IEEE Std 430-1986)

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IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations

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IEEE-SA Standards Board

Abstract: Uniform procedures for the measurement of radio noise generated by corona from overhead power lines and substations are established in this standard. Measurement procedures in this standard are also valid for other power-line noise sources such as gaps and harmonics; however, most of the precautionary information, analysis, and data plotting techniques were written and developed primarily for corona discharges. The procedures are not valid for measuring transient radio noise sources that occur during breaker or disconnect switching operations. The procedures apply in the frequency range of 0.010 MHz to 1000 MHz; however, the emphasis is on the standard amplitude-modulation broadcasting (0.535 MHz to 1.605 MHz) and television broadcasting (54 MHz to 72 MHz, 76 MHz to 88 MHz, 174 MHz to 216 MHz, and 470 MHz to 698 MHz) bands. This standard is applicable to both ac and dc transmission lines and substations.

Keywords: corona, IEEE 430™, measurements, radio noise, substations, transmission lines

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Introduction

This introduction is not part of IEEE Std 430-2017, IEEE Standard for Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations.

The primary purpose of this standard is to establish uniform procedures for the measurement of radio noise generated by corona from overhead power lines with instrumentation that conform to ANSI C63.2:2009[1]. A uniform procedure is a prerequisite to comparisons or validation, or both, of the radio noise performance of various overhead power lines and substations. Measurement procedures in this standard are also valid for other power-line noise sources such as gaps and harmonics; however, most of the precautionary information, analysis, and data plotting techniques were written and developed primarily for corona discharges. The procedures are not valid for measuring transient radio noise sources that occur during breaker or disconnect switching operations. The procedures apply in the frequency range of 0.010 MHz to 1000 MHz; however, the emphasis is on the standard amplitude-modulation broadcasting (0.535 MHz to 1.605 MHz) and television broadcasting (54 MHz to 72 MHz, 76 MHz to 88 MHz, 174 MHz to 216 MHz, and 470 MHz to 698 MHz) bands. This standard is applicable to both ac and dc transmission lines and substations.

This standard was first issued as a trial-use standard in 1972 after a period of approximately 10 years in development. It became a full standard in 1976.

For the 1986 revision, revisions were made regarding the adoption of the IEC (International Electrotechnical Commission) CISPR (International Special Committee on Radio Interference) specifications for interference measuring apparatus for the frequency range 0.15 MHz to 30 MHz by the Accredited Standards Committee on Electromagnetic Compatibility C63®. In addition, the revision included additional material on both short- and long-term measurements, both ac and dc lines, and included a trial use guide for substation measurements.

This 2017 revision incorporates further updates regarding quasi-peak detector requirements, newer equipment, general document improvement, and an informative annex regarding how the measurements may relate to transmission line design.

[1]Information on references can be found in Clause 2.

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IEEE Standard Procedures for the Measurement of Radio Noise from Overhead Power Lines and Substations

1. Scope

This standard establishes uniform procedures for the measurement of radio noise generated by corona from overhead power lines and substations. Measurement procedures in this standard are also valid for other power-line noise sources such as gaps and harmonics; however, most of the precautionary information, analysis, and data plotting techniques were written and developed primarily for corona discharges. The procedures are not valid for measuring transient radio noise sources that occur during breaker or disconnect switching operations. The procedures apply in the frequency range of 0.010 MHz to 1000 MHz; however, the emphasis is on the standard amplitude-modulation broadcasting (0.535 MHz to 1.605 MHz) and television broadcasting (54 MHz to 72 MHz, 76 MHz to 88 MHz, 174 MHz to 216 MHz, and 470 MHz to 698 MHz) bands. This standard is applicable to both ac and dc transmission lines and substations.

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 C63.2-2009, American National Standard for Electromagnetic Noise and Field Strength Instrumentation, 10 Hz to 40 GHz Specifications.[2]

CISPR 16-1-1:2010, Specification for Radio Interference Measuring Apparatus and Measurement Methods—Part 1–1: Radio Disturbance and Immunity Measuring Apparatus—Measuring Apparatus.[3]

IEEE Std 291™, IEEE Standard Methods for Measuring Electromagnetic Field Strength of Sinusoidal Continuous Waves, 30 Hz to 30 GHz.[4,5]

[2]This publication is available from The Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08854, USA (http://ieeexplore.ieee.org/).
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