

An American National Standard

IEEE Recommended Practice for Voice-Frequency Electrical-Noise Tests of Distribution Transformers

Sponsor
**Transmission Systems Committee
of the
IEEE Communications Society**

Approved June 9, 1988
Reaffirmed March 17, 1994

IEEE Standards Board

Approved September 26, 1988
American National Standards Institute

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Foreword

(This Foreword is not a part of ANSI/IEEE Std 469-1988, IEEE Recommended Practice for Voice-Frequency Electrical-Noise Tests of Distribution Transformers.)

1977 Issue

There has long been a need to provide standard methods of testing distribution transformers to determine their voice-frequency noise contribution to paralleling communications circuits. In recognition of this fact, the Inductive Coordination and Electrical Protection Subcommittee of the Wire Communication Committee established a working group to research this problem. The personnel of the TIF Objectives Working Group that developed this recommended practice were as follows:

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The working group also wishes to acknowledge the able technical assistance and guidance provided by G. Y. A. Allen. Mr. Allen is Chairman of the Inductive Coordination and Electrical Protection Subcommittee, which has reviewed and approved this guide.

1988 Issue

The 1977 standard has been revised so as to justify the use of secondary circuit excitation measurements, provide the derivation of the constants used in interpreting the measurements, and to provide the rationale for deriving limits. As part of this revision, reference tables are expressed in the form usually used and a number of outdated forms have been dropped. The members of the TIF Objectives Working Group involved with this revision are as follows:

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On June 10, 1987, the ICEP Balloting Committee voted to submit this document to the IEEE Standards Board. The following members were present:

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When the IEEE Standards Board approved this standard on June 9, 1988, it had the following membership:

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IEEE Recommended Practice for Voice-Frequency Electrical-Noise Tests of Distribution Transformers

1. Introduction and References

1.1 General

The practice described herein provides instruction for the testing of distribution transformers as sources of voice-frequency noise. These tests measure the degree to which a transformer may contribute to electrical noise in communication circuits that are physically paralleling the power-supply circuits feeding the transformer.

Transformers have a characteristic that is common to other iron-core devices of causing harmonic currents at voice frequencies to flow in supply circuits to the transformers. The magnitude of these currents, and of interference that may result, varies according to the design of the transformer as well as the excitation voltage. The tests described in this practice provide a standard method for use by the transformer manufacturer, user, and others in industry for the purpose of better evaluating the design choices that are available and moving toward industry objectives with regard to levels of harmonic exciting current expressed as $I \cdot T$ (current $\times$ telephone influence factor [TIF]).

1.2 References

The following publications shall be used in conjunction with this standard.

[1] ANSI/IEEE C57.13-1978 (R1986), IEEE Standard Requirements for Instrument Transformers.¹

[2] ANSI/IEEE Std 100-1984, IEEE Standard Dictionary of Electrical and Electronics Terms.

[3] BALL, W. C., and POARCH, C. K. Telephone Influence Factor (TIF) and Its Measurement. *AIEE Trans. Commun. Electron.*, vol 79, Jan 1961, pp 659–664.

[4] *The Telephone Influence Factor of Supply Systems Voltages and Currents*. Joint Subcommittee on Development and Research, Edison Electric Institute and Bell Telephone System, Suppl Engineering Report 33, EEI Publication 60–68, New York, NY, Sep 1960.

¹ANSI/IEEE publications can be obtained from the Sales Department, American National Standards Institute, 1430 Broadway, New York, NY 10018, or from the Institute of Electrical and Electronics Engineers, Service Center, Piscataway, NJ 08854-1331.