

An American National Standard

**IEEE Recommended Practice for Establishing
Transformer Capability When Supplying
Nonsinusoidal Load Currents**

Sponsor
**Performance Characteristics Subcommittee
of the
Transformers Committee
of the
IEEE Power Engineering Society**

Secretariat

**Institute of Electrical and Electronics Engineers
National Electrical Manufacturers Association**

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Foreword

(This Foreword is not a part of ANSI/IEEE C57.110-1986, IEEE Recommended Practice for Establishing Transformer Capability When Supplying Nonsinusoidal Load Currents.)

The increasing use of static rectification equipment in industrial loads on small and medium power transformers has resulted in an increase in the harmonic content of the load current for this equipment. It is now quite common for the harmonic factor of the current to exceed 0.05 per unit, which is the limit specified for “usual service conditions” in ANSI/IEEE C57.12.00-1987 and C57.12.01-1979. Higher harmonic content in the current causes higher eddy current loss in winding conductors and structural parts linked by the transformer leakage flux field and, consequently, higher operating temperature. Users identified to the IEEE Transformers Committee the need for guidance in their loading practices, so that the useful life of transformers would not be shortened when carrying nonsinusoidal load currents. A working group was formed to respond to this need and has prepared the subject recommended practice. Precise determination of the extra eddy current loss produced by harmonic currents is a complex subject that may involve sophisticated computer analysis. Such treatment is not given in this document. Rather, the document presents approximate calculation techniques that have two features to recommend them: they may be made with a simple hand-held calculator and their results will be conservative.

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