IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems

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Foreword

(This Foreword is not a part of ANSI/IEEE Std 142-1982, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems.)

This recommended practice is a revision of IEEE Std 142-1972. The subjects covered by this document are divided into four parts corresponding to the four sections.

Section 1 covers the problems of system grounding, that is, connection to ground of the neutral, of the corner of the delta, or of the midtap of one phase. The advantages and disadvantages of grounded versus ungrounded systems are discussed. Information is given on how to ground the system, where the system should be grounded, and how to select equipment for the grounding of the neutral circuits.

Section 2 deals with the problems of connecting the frames and enclosures of electric apparatus, such as motors, switchgear, transformers, buses, cables, conduits, building frames, and portable equipment, to a ground system. It also outlines the fundamentals of making the inter-connection or ground-conductor system between electric equipment and the ground rods, water pipes, etc.

Section 3 deals with the problems of static electricity—how it is generated, what processes may produce it, how it is measured, and what should be done to prevent its generation or to drain the static charges to earth to prevent sparking. The methods of protecting structures against the effects of lightning are also covered; since the system for protecting structures against lightning consists entirely of conductors to earth, it is considered within the scope of this document to discuss the general aspects of the problem.

Section 4 deals with the problems of obtaining a low-resistance connection to the earth. The use of ground rods, connections to water pipes, etc, are discussed.

Looking at the problem from an overall standpoint, the grounding of the system would in most cases be done by making a metallic connection directly or through an impedance between transformer or generator neutrals and the building grounding system that is described in Section 2. The grounding system described in Section 2 in turn is connected to earth through the system of ground rods and water pipes described in Section 4.

The protective system for static and lightning protection discussed in Section 3 would likewise be connected to the ground rods and water pipe system, as outlined in Section 4.

The major revisions are contained in Section 3, with only minor changes in Sections 1, 2, and 4.

This recommended practice was reviewed and approved by the Power Systems Technologies Committee of the IEEE Industry Applications Society. This revision was prepared by the Power Systems Grounding Subcommittee, of the Power Systems Technologies Committee. At the time it approved this recommended practice, the subcommittee had the following membership:

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Grounding of Industrial and Commercial Power Systems

4th Edition

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