2.1 Title: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System


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3.2 Sponsoring Society and Committee: IEEE Power and Energy Society/Substations (PE/SUB)

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4.1 Type of Ballot: Individual

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 09/2018

4.3 Projected Completion Date for Submittal to RevCom: 08/2019

5.1 Approximate number of people expected to be actively involved in the development of this project: 30

5.2 Scope: The test methods and techniques used to measure the electrical characteristics of the grounding system include the following topics:

a) Establishing safe testing conditions
b) Measuring earth resistivity
c) Measuring the power system frequency resistance or impedance of the ground system to remote earth
d) Measuring the transient (surge) impedance of the ground system to remote earth
e) Measuring step and touch voltages
f) Verifying the integrity of the grounding system
g) Reviewing common methods and procedures for performing ground testing
h) Reviewing instrumentation characteristics and limitations
i) Reviewing various factors that can distort test measurements

5.3 Is the completion of this standard dependent upon the completion of another standard: No

5.4 Purpose: The purpose of this guide is to present practical instrumentation methods that may be used for measuring soil resistivity, the impedance to remote earth, step and touch voltages, and current distributions in ground grids associated with electric utility facilities. These grids typically consist of interconnected grounding systems ranging in complexity from a few ground rods to large grids with many ground rods or wells, buried conductors, and external ground connections. External ground connections may include overhead shield/ground/neutral wires, underground cable sheaths/neutrals, counterpoises, grid tie conductors, metallic pipes, and other connections that provide additional
paths to remote earth.
This guide is intended to assist the engineer or technician in obtaining and interpreting accurate, reliable data. The factors that influence the choice of instruments are discussed along with a presentation of field techniques for various types of measurements. These factors include the purpose of the measurement, the accuracy required, the types of instruments available, the possible sources of error, and the nature of the ground or grounding system under test. It also describes test procedures that promote the safety of personnel and property, and it seeks to minimize operating interferences with neighboring facilities.

5.5 Need for the Project: Engineers and technicians in the power and communication industries routinely perform tests and measurements on various types of grounding systems. This guide is needed to enable the engineer or technician to understand various methods of performing field measurements; to clarify the limitations and assumptions of each method; to discuss factors that can introduce errors into the measurements; and to identify possible safety hazards that may be encountered during the measurements.

5.6 Stakeholders for the Standard: Engineers in the electric and telephone industry concerned with measuring the electrical characteristics of soil and various grounding systems. Equipment manufacturers, engineers and technicians in the electric and telephone industry.

Intellectual Property
6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No
6.1.b. Is the Sponsor aware of possible registration activity related to this project?: No

7.1 Are there other standards or projects with a similar scope?: No
7.2 Joint Development
   Is it the intent to develop this document jointly with another organization?: No

8.1 Additional Explanatory Notes (Item Number and Explanation): Section 5.5 correctly states the fundamental reason for the project. However, there are additional test methods that should be added to the Guide and there are continuing advances in test equipment that should be addressed. In addition, the working group will be releasing a user survey on IEEE Std 81 to gain additional input as to areas that can be improved.