P81

Submitter Email: dfdecosta@cai-engr.com
Type of Project: Modify Existing Approved PAR
PAR Request Date: 13-Apr-2010
PAR Approval Date: 17-Jun-2010
PAR Expiration Date: 31-Dec-2011
Status: Modification to a Previously Approved PAR for the Revision of a Standard
Root PAR: P81 **Approved on:** 04-Mar-2005
Project Record: No Project Record
Root Project: 81-1983 Edit Root Project Record

1.1 Project Number: P81
1.2 Type of Document: Guide
1.3 Life Cycle: Full Use

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

---

3.1 Working Group: Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System Working Group (PE/SUB/WGD6)
Contact Information for Working Group Chair
Name: Dennis Decosta
Email Address: dfdecosta@cai-engr.com
Phone: 517-788-3051
Contact Information for Working Group Vice-Chair
None

3.2 Sponsoring Society and Committee: IEEE Power & Energy Society/Substations (PE/SUB)
Contact Information for Sponsor Chair
Name: Hermann Koch
Email Address: hermann.koch@siemens.com
Phone: +49 9131 733 862
Contact Information for Standards Representative
Name: Anne-Marie Sahazizian
Email Address: am.sahazizian@hydroone.com
Phone: 416-345-6657

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 11/2010
4.3 Projected Completion Date for Submittal to RevCom: 10/2011

5.1 Approximate number of people expected to be actively involved in the development of this project: 25
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.

Old Scope: This project will provide a single document with practical solutions for various testing methods and interpretation of results for measurements used in the design of new and evaluation of existing grounding systems.

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 potentials; 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 and neutral wires; underground cable sheaths and 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, 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 seeks to minimize operating interferences with neighboring facilities.

Old Purpose: IEEE Std 81-1983 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements and IEEE 81.2 - 1991 Guide for Measurement of Impedance and Safety Characteristics of Large, Extended or Interconnected Grounding Systems have not been reviewed/revised for more than 14 years. The purpose of the new standard is to combine both documents and update content for new technologies and testing methods.

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

---

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 International Activities

a. Adoption

Is there potential for this standard (in part or in whole) to be adopted by another national, regional or international organization?: Do Not Know

Organization:

Technical Committee Name:

Technical Committee Number:

Contact Name:

Phone:

Email:

b. Joint Development

Is it the intent to develop this document jointly with another organization?: Do Not Know

Organization:
Technical Committee Name:
Technical Committee Number:
Contact Name:
Phone:
Email:

c. Harmonization

Are you aware of another organization that may be interested in portions of this document in their standardization development efforts?: Do Not Know

Organization:
Technical Committee Name:
Technical Committee Number:
Contact Name:
Phone:
Email:

8.1 Additional Explanatory Notes (Item Number and Explanation): Changes were made to the scope and purpose of the document as requested by the working group members. The reason for the change was to be specific as to the intent of the new document rather than state that two documents were being pulled together into a single document and updated to reflect current technology.

The change in submission dates was made to agree with the PAR extension granted in May of 2009.