

# Preface

The book *Power System Grounding* is intended for both lower- and upper-level undergraduate students studying power system, design, and measurement of grounding system, as well as a reference for power system engineers. For reference, this book has been written in a step-by-step method. In this method, this book covers the fundamental knowledge of power, transformer, different types of faults, soil properties, soil resistivity, and ground resistance measurement methods. This book also includes fundamental and advanced theories related to the grounding system.

Nowadays, the demand for smooth, safe, and reliable power supply is increasing due to an increase in the development of residential, commercial, and industrial sectors. The safe and reliable power supply system is interrupted due to different faults including lightning, short circuit, and ground faults. A good grounding system can protect substations, and transmission and distribution networks from these kinds of faults. In addition, a good grounding system ensures the safety of humans in the areas of faulty substations in case of ground faults, and decreases the electromagnetic interference in substations.

This book is organized into seven chapters and two appendices. Chapter 1 deals with the fundamental knowledge of power analysis. Transformer fundamentals and practices are discussed in Chap. 2. Chapter 3 covers the issues on the symmetrical and unsymmetrical faults. Chapter 4 includes the grounding system parameters and resistance. In this chapter, different parameters related to the grounding system and expressions of resistance with different sizes of electrodes are discussed. Chapter 5 presents ideas on different types of soil, properties of soil, influence of different parameters on soil, current density, and Laplace and Poisson equations and their solutions. Chapter 6 describes different measurement methods of soil resistivity. The grounding resistance measurement methods are discussed in Chap. 7.

This book will offer both students and practice engineers the fundamental concepts in conducting practical measurements on soil resistivity and ground resistance at residential and commercial areas, substations, and transmission and distribution networks.

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Power Systems Grounding

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