The Third Edition of Protective Relaying, Principles and Applications comes twenty years after the first edition of the book that has been one of the key reference books for protection engineers in North America, as well as many others around the world. The popularity of the original was mainly due to the style of the book – straightforward and application oriented.

The core of this book, is on the fundamentals of electric power systems analysis, especially fault calculations, and the requirements and principles of protection of the different system components.

The need for this third edition is driven by the significant changes in protection technology that started around the time of the publishing of the first edition and has become widely accepted in the last ten years. At the same time, we have seen a change in the utility environment characterized by loss of expertise, operation of the electric power system close to its stability limit, distributed generation and increase in the number of industrial customers sensitive to voltage variations. All of these require a new approach to the protection of the power system based on good understanding of the power system events and the behavior of protection relays and systems under these conditions. The new chapters in this new edition, are focused on microprocessor based protection relays, and their integration in substation automation systems.

More than 600 pages of the book are divided in fifteen chapters: The first chapter discusses general requirements for protection, operating principles and applications. The next three chapters introduce some fundamental concepts, such as per unit calculations, phasors, polarity and symmetrical components. The instrument transformers, their performance, and criteria for selection are discussed in Chapter 5. Optical sensors are described at the end of the chapter.

Protection fundamentals and basic design principles are later introduced, followed by detailed discussions of the different types of protection typically used:

- Generator (including intertie protection for distributed generation) and motor protection
- Transformer, reactor and shunt capacitor protection
- Bus protection
- Line and Feeder protection

Different issues related to the security and stability of the electric power system, such as reclosing and load shedding are discussed in Chapter 14. The last chapter focuses on the new technology in power system protection - microprocessor based relays and their applications, non-protection functions in these devices and their integration in substation automation systems.

Many chapters of the book include bibliography with papers for further reading, while some have appendices or examples that help the user understand the practical application of the theory discussed. The book also includes a section with problems that can be used by the reader to practice what they have learned.

The main additions in the Third Edition include the material related to new technology and system stability. This, combined with the fundamental concepts and applications of electric power systems protection make this book a good reference for anyone with interest in protection, automation and control.

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