

Electrical Protection Systems: Design, Coordination, and Testing

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Electrical Protection Systems: Design, Coordination, and Testing

Overview

A comprehensive course covering the principles of power system protection. The course provides a very detailed introduction to essential protection principles at a level that does not require knowledge of complex numbers. It is important to take the necessary action to prevent the faults, and if they do occur, to minimise possible damage or possible power disruption. A protection system continuously monitors the power system to ensure a maximum of electrical supply with minimum damage to life, equipment and property. Many utilities need this practical course that studies the Relay characteristics during faults, and weak protection points in electrical systems. These studies will be elaborated by practical case studies.

Course Objectives

At the end of this course the participants will be able to:

- Understand why protection is critical on electrical networks
- Review the Grounding System of generation, Transmission and Distribution Networks and how it affects the electrical quantities, short circuit level and protection system.
- Understand the main concepts of protection equipment and its necessity in electrical System.
- Know how to make relay coordination for main and back-up protection relays on the network.
- Understand how to protect the power system due to up normal operational conditions.



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Course Content

- Introduction to Electrical Power System (Generator – Transmission – Distribution).
- Principles of the protection system in electricity
- How the protection system works
- Protection system requirements and equipment
- Protection coordination
- Main features and advantages of proper protection design
- Over-current protection relays
- Voltage protection relays
- Frequency protection relays
- Differential protection relays
- How to test a protection relay
- Case study and practical implementations

Targeted Audience

- electrical Engineers & Supervisors, who work in operation,
- maintenance, protection, control
- and analysis of Utilities & Industries Electrical Networks



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Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be used before and during the course whenever applicable. These methods are aimed at enhancing individual and group interaction while maximizing learning. Some of these methods are:

- Online Pre-post Test
- Colorful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games

