



Basic Protective Relay Testing and Maintenance **36 Hours**

Who Should Attend?

Technicians with no or very little relay testing experience who are responsible for the testing and maintenance of ***overcurrent, under and over voltage, differential protective relays***.

Course Description:

This certification course is based on equipment specific testing & maintenance requirements. Students will learn basic operating principles and construction of popular basic protective relays used in industrial and utility systems. Minimal time is spent on theory in order to allow more testing time in lab. Students will be required to demonstrate the required testing skills and technical knowledge on each relay.

Learning Objectives:

- How to perform the required electrical tests on basic protective relays.
- How to perform required adjustments on basic protective relays.
- Read external and internal relay schematics founded in manufacturer instruction literature.
- How to apply test connection diagrams in manufacturer instruction literature to participant's specific relay test sets.
- How to use timing characteristic curves for basic protective relays.
- Understand the operation of overcurrent, voltage and differential protective relays.

Prerequisites:

- Basic AC and DC electrical knowledge.

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Basic Relay Technician Certification Course Outline

I. Introduction

- A) Student introductions
- B) Pre-Test

II. Introduction to Protective Relaying

- A) Purpose of Protective Relays
- B) Instrument transformers
 - i) Types
 - ii) Connections
- C) Hazards
- D) One Line diagram
- E) Identify Relay Types
- F) IEEE Standard Device Numbers

III. Relay Fundamentals

- A) Principles of Operation
 - i) Electromagnetic Attraction
 - ii) Electromagnetic Induction
 - iii) Solid State
- B) Relay Safety
- C) Shorting Devices
- D) Test Paddles
- E) Internal Schematics
- F) Relay Inspection

IV. Overcurrent Relay Testing

- A) Relay Application
- B) Inspection and Maintenance Requirements
- C) Testing of Overcurrent Relays
- D) Review of Manufactures Literature

V. Voltage Relay Testing

- A) Relay Application
 - i) Overvoltage
 - ii) Undervoltage
- B) Inspection and Maintenance Requirements
- C) Testing of Voltage Relays
- D) Review of Manufactures Literature

VI. Overcurrent & Voltage Relay Lab

- A) Overcurrent Relay Lab
- B) Voltage Relay Lab
- C) Review

VII. Differential Relaying

- A) Relay Application
 - i) Motor
 - ii) Generator
 - iii) Transformer
 - iv) Bus
- B) Inspection and Maintenance Requirements
- C) Testing of Differential Relays
- D) Review of Manufactures Literature

VIII. Differential Relay Lab

- A) Motor & Generator Differential Relay Lab
- B) Transformer Differential Relay Lab
- C) Bus Differential Relay Lab
- D) Review

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