Technical Diagnostic Services Training Institute

Advanced Protective Relay Testing and Maintenance

36 Hours

Who Should Attend?

Technicians and Field Engineers with two (2) or more years of relay testing experience, including the use of phase shifters and/or digital test sets that are responsible for the testing and maintenance of ***Directional Overcurrent, Power, Sync-Check, Loss of Field, and Distance Protective Relays***.

Course Description:

This course is based on equipment specific testing & maintenance requirements. Students will learn operating principles and construction of ***complex protective relays*** used in industrial and utility systems. ***Vector analysis*** will be taught to ensure that students have the proper knowledge to use phase shift test sets. Both electromechanical and solid state relays will be covered. Minimal time will be 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 complex protective relays.
- How to perform required adjustments on complex 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 interpret test results.
- Understand the operation of Directional Overcurrent, Power, Sync-Check, Loss of Field, and Distance Protective Relays.

Prerequisites: Four years experience in testing protective relays or two years experience in testing protective relays with either successful completion of a basic protective relay course or adequate related vendor supplied course(s).

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Advanced Electro-Mechanical Protective Relay Testing and Maintenance

36 Hours

I. Introduction
- A) Student Introduction
- B) Pre-test

II. Directional Overcurrent
- A) Relay Application
- B) Internal Schematics
- C) Directional Operation
- D) Inspection and Maintenance Requirements
- E) Testing Directional Relays
- F) Testing Ground Directional Relays
- G) Review of Manufacturers Literature

III. Reverse Power
- A) Relay Application
- B) Internal Schematics
- C) Inspection and Maintenance Requirements
- D) Testing Reverse Power Relays
- E) Review of Manufacturers Literature

IV. Directional Overcurrent & Reverse Power Lab
- A) Directional Overcurrent Relay Lab
- B) Ground Directional Overcurrent Relay Lab
- C) Reverse Power Relay Lab
- D) Review

V. Sync-Check Relays
- A) Relay Application
- B) Operating Window
- C) Slip Frequency
- D) Inspection and Maintenance Requirements
- E) Testing Sync-Check Relays
- F) Review of Manufacturers Literature

VI. Sync-Check Relay Lab
- A) Sync-Check Lab
- B) Review

VII. Loss of Field Relays
- A) Relay Application
- B) Internal Schematics
- C) Inspection and Maintenance Requirements
- D) Testing of Loss of Field Relays
- E) Review of Manufacturers Literature

VIII. Distance Relays
- A) Relay Application
- B) Internal Schematics
- C) Inspection and Maintenance Requirements
- D) Testing of Distance Relays
- E) Review of Manufacturers Literature

IX. Loss of Field & Distance Relay Lab
- A) Loss of Field Relay Lab
- B) Distance Relay Lab
- C) Review

X. Course Conclusion
- A) Class Review
- B) Final Examination

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