



Technical Diagnostic Services Training Institute

**Protective Relaying and Electrical Print Reading
for Operators and Supervisors
8 hours - 1 Day**

- Who should attend?** Designed for field, plant, supervisory and new-hire personnel having a need to learn basic electrical distribution, components, print reading, troubleshooting, and electrical safety. This course is excellent for new electrical personnel and for cross-training.
- Course Description:** This course is an introduction to typical generating facility power distribution systems. It encompasses an electrical distribution system from the switchyard tie to the battery bank including typical components of an electrical distribution system, basic print reading, component identification, troubleshooting, and electrical safety.
- Lab vs. Lecture Time:** Approximately 50% hands-on lab time vs. 50% lecture. This will vary with the actual class.

TDSTI

15825 Trinity Blvd., Ft. Worth, Texas 76155
Phone: 817/465-9494 Fax: 817/465-9573
www.technicaldiagnostic.com johnh@technicaldiagnostic.com

Protective Relaying and Electrical Print Reading for Operators Supervisors Outline

I) Electrical Plant Overview

- A) Main Generator
 - i) Black Start
 - ii) Switchyard Ties
 - iii) Main Transformer
 - iv) Main Generator Output
- B) Unit Auxiliary Transformer
 - i) Purpose
 - ii) Isolating
- C) Startup Transformer
 - i) Purpose
 - ii) Isolating
- D) Plant High Voltage Distribution System
 - i) Purpose
 - ii) Isolating
 - iii) Breaker Operation
 - iv) Typical Protection Schemes
 - v) Typical Protection Devices
- E) Plant Medium Voltage Distribution System
 - i) Purpose
 - ii) Isolating
 - iii) Breaker Operation
 - iv) Typical Protection Schemes
 - v) Typical Protection Devices
- F) Plant Low Voltage Distribution System
 - i) Purpose
 - ii) Isolating
 - iii) Breaker Operation
 - iv) Typical Protection Schemes
 - v) Typical Protection Devices
- G) Plant DC Distribution
 - i) Purpose
 - ii) Isolating
 - iii) Breaker Operation
 - iv) Batteries and Inverters
 - v) Typical Protection Schemes
 - vi) Typical Protection Devices

II) Electrical System Components

- A) Transformers
- B) Breakers
- C) Protective Devices and Numbers

III) Electrical Print Reading

- A) Three Line Drawings
- B) Single Line Drawings
- C) Components and Identification
 - i) Current Transformers (CT)
 - ii) Potential Transformers (PT)
 - iii) Relays
 - iv) Meters
 - v) Signals
- D) Component Function and Operation
- E) Selective Tripping and Load Shedding
 - i) Coordination of Trip Devices
 - ii) Motor Protection
 - iii) Fusing
 - iv) 86 Relay Function
- F) Load Study and Bus Design

IV) Basic Troubleshooting

- A) Identifying Problems
- B) Reporting Problems
- C) Resolving Problems

V) Basic Electrical Safety

- A) Bus Safety
 - i) Dual Feeders
 - ii) Bus Ties
 - iii) Automatic Bus Transfer
- B) Working With Foreign Voltages
- C) Lockout / Tagout

VI) Abnormal Operation

- A) Testing
- B) Backfeeding

VII) Summary

- A) Review
- B) Question and Answer
- C) Student Feedback

TDSTI

15825 Trinity Blvd., Ft. Worth, Texas 76155

Phone: 817/465-9494 Fax: 817/465-9573

www.technicaldiagnostic.com

johnh@technicaldiagnostic.com