



Consulting and Training | Reach New Heights

Course Name

Electrical Protection & Fault Coordination

Sector Name

Electrical Engineering

Document Type

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Electrical Protection & Fault Coordination

Course Introduction

When an electrical fault occurs, protection must act quickly—but speed alone is not enough. A poorly coordinated protection system can disconnect healthy sections, cause unnecessary loss of supply, allow faults to persist longer than intended, or create situations where upstream and downstream devices operate together. As electrical networks expand and operating configurations change, protection settings that once performed correctly may no longer provide the selectivity and coverage the system requires.

Boost Consulting & Training has designed this course around the practical engineering decisions involved in electrical protection and fault coordination. Participants will examine fault behavior, protection zones, relay and protective-device functions, time-current characteristics, selectivity, sensitivity, and backup protection. They will learn how to evaluate coordination across different voltage levels and equipment types, identify protection gaps and overlaps, and assess the impact of network changes on existing protection arrangements.

The main concept of this course is to ensure that electrical faults are detected and isolated by the right protective device, at the right time, and with the minimum possible impact on the healthy parts of the power system.

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Electrical Protection & Fault Coordination

Target Audience

- ✓ Electrical and power systems engineers
- ✓ Protection and control engineers
- ✓ Electrical maintenance engineers
- ✓ Plant, utility, and facility electrical professionals

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Electrical Protection & Fault Coordination

Learning Objectives

- ✓ Explain the principles of electrical protection and selective fault isolation.
- ✓ Identify different fault conditions and their effects on power-system behavior.
- ✓ Define protection zones and primary and backup protection requirements.
- ✓ Interpret protection characteristics and time-current coordination information.
- ✓ Evaluate coordination between relays, circuit breakers, and other protective devices.
- ✓ Identify protection gaps, overlaps, and settings that can cause unnecessary system interruption.
- ✓ Assess the impact of network and operating changes on protection performance.
- ✓ Develop coordinated protection solutions for practical electrical-system scenarios.

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Electrical Protection & Fault Coordination

Course Outline

✓ DAY 01

Building the Protection Strategy

Understanding Protection Responsibilities

- ✓ Connecting protection requirements with personnel safety, equipment protection, and continuity of supply
- ✓ Defining selectivity, sensitivity, speed, reliability, and security in practical protection decisions
- ✓ Identifying the consequences of under-protection, over-tripping, and incorrect device operation

Dividing the System into Protection Zones

- ✓ Establishing protection boundaries around generators, transformers, busbars, feeders, motors, and other equipment
- ✓ Understanding primary, overlapping, and backup protection arrangements
- ✓ Developing a Protection Zone Map from a realistic single-line diagram

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Course Outline

✓ DAY 02

Reading Fault Behavior

Understanding Electrical Fault Conditions

- ✓ Examining three-phase, phase-to-phase, and earth-fault conditions
- ✓ Understanding how fault location, system impedance, and grounding influence fault magnitude
- ✓ Connecting calculated or measured fault conditions with protection requirements

Matching Protection to the Fault

- ✓ Selecting appropriate overcurrent, earth-fault, differential, and other protection functions
- ✓ Understanding pickup, operating time, instantaneous elements, and protection reach
- ✓ Completing a Fault-to-Protection Matching Exercise across different equipment scenarios

Electrical Protection & Fault Coordination

Course Outline

✓ DAY 03

Coordinating Protective Devices

Working with Protection Characteristics

- ✓ Reading relay curves and time-current characteristics used in coordination studies
- ✓ Understanding operating margins between downstream and upstream protective devices
- ✓ Evaluating the effect of pickup and time settings on selectivity and fault-clearing performance

Achieving Selective Fault Isolation

- ✓ Coordinating protection across feeders, transformers, motors, and distribution levels
- ✓ Resolving situations where protection curves overlap or leave inadequate coverage
- ✓ Conducting a Protection Coordination Challenge using multiple protective devices

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Course Outline

✓ DAY 04

Managing Complex Protection Scenarios

Balancing Primary & Backup Protection

- ✓ Ensuring backup protection operates when primary protection or associated equipment fails
- ✓ Managing the trade-off between backup coverage and unnecessary upstream disconnection
- ✓ Evaluating breaker failure and delayed fault-clearing scenarios

Protection Under Changing Network Conditions

- ✓ Assessing protection performance under alternative feeders, parallel sources, and changing system configurations
- ✓ Evaluating the impact of new loads, generation sources, and equipment modifications on existing settings
- ✓ Running a Network Change Protection Review to identify settings requiring reassessment

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Course Outline

✓ DAY 05

Improving Protection System Performance

Investigating Protection Operations

- ✓ Reconstructing fault events from relay indications, trip records, sequence information, and system conditions
- ✓ Distinguishing correct protection operation from unwanted, delayed, or failed operation
- ✓ Identifying whether problems originate from settings, coordination, equipment, or system changes

Completing the Coordination Study

- ✓ Reviewing protection coverage and selectivity across an integrated electrical network
- ✓ Documenting setting rationale, coordination margins, limitations, and recommended adjustments
- ✓ Completing an Electrical Protection & Fault Coordination Study for a realistic power-system case

Electrical Protection & Fault Coordination

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 21, 2026	Dec. 25, 2026	5 days	4250.00 \$	UAE , Abu Dhabi

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