Electrical Protection Coordination and Relay Settings Training Course

26 – 30 September 2027
Johannesburg

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Ref: 1706_228268 **Date:** 26 – 30 September 2027 **Location:** Johannesburg **Fees:** 6000 Euro

Overview

Electrical Protection Coordination and Relay Settings Training Course is a one-week course for electrical, protection, power-system, maintenance, commissioning, utility, and industrial technical teams, who leave with a Protection Coordination Study Pack. The course connects fault-current analysis, protection zones, instrument transformers, protective-device characteristics, relay settings, time-current coordination, selectivity, testing, documentation, and fault diagnosis in one engineering workflow. Agile Leaders Training Center presents the course on electrical protection coordination and relay settings.

Who Should Attend

- Teams responsible for protection studies and relay settings
- Functions responsible for electrical network design and fault analysis
- Specialists responsible for commissioning protective relays and switchgear
- Teams responsible for maintenance, testing, and incident diagnosis
- Technical functions responsible for utility and industrial power-system reliability

The course assumes participants work with electrical single-line diagrams, power equipment, maintenance, commissioning, or network studies and leaves out introductory electrical theory, detailed power-flow control, relay firmware development, and certification preparation.

Departments and Industries

The course supports electrical protection decisions across utility, industrial, infrastructure, and process operations.

- Power-system protection and engineering departments
- Electrical maintenance and reliability teams
- Testing, commissioning, and asset-management functions
- Electric utilities and independent power facilities
- Manufacturing, mining, oil and gas, and water operations
- Transport, data center, healthcare, and large-building infrastructure

Learning Objectives

By the end of this course, participants will be able to:

- Analyze fault-current paths, protection zones, and device duties
- Evaluate current and voltage transformer suitability
- Build overcurrent and earth-fault relay settings
- Compare differential and distance protection applications
- Apply time-current coordination and selectivity methods
- Diagnose coordination, testing, and documentation deficiencies

Course Agenda

Day 1: Fault Studies and Protection Architecture

- Single-Line Diagram and Protection Zone Map
- IEC 60909-0 Short-Circuit Current Calculation Method
- Fault Type and Current Path Scenario Matrix
- Breaker Duty and Interrupting Capacity Check
- Protection Philosophy and Selectivity Criteria Register

Day 2: Instrument Transformers and Protective Devices

- IEC 61869 Instrument Transformer Application Checklist
- Current Transformer Ratio, Burden, and Saturation Review
- Voltage Transformer Connection and Supervision Map
- Fuse, Breaker, and Relay Characteristic Comparison
- Protection Device Data and Setting Input Sheet

Day 3: Relay Functions and Settings

- Overcurrent Pickup and Time Dial Calculation
- Earth-Fault Sensitivity and Residual Connection Method
- Differential Protection Zone and Restraint Logic Map
- IEC 60255-121 Distance Protection Characteristic Review
- Relay Setting Calculation and Approval Record

Day 4: Coordination, Testing, and Troubleshooting

- Time-Current Curve Coordination Method
- Upstream and Downstream Selectivity Margin Check
- Relay Test Plan and Injection Result Record
- Trip Circuit, Logic, and Communication Verification
- Protection Misoperation Root Cause Workflow

Day 5: Protection Coordination Practice

- Fault Study and Protection Zone Exercise
- Instrument Transformer and Device Selection Exercise
- Relay Setting and Time-Current Curve Exercise
- Testing and Misoperation Diagnosis Exercise
- Protection Coordination Study Pack Capstone Exercise

Practical Exercises

The course uses suggested activities to practice electrical protection coordination and relay-setting decisions.

- Suggested activity: map fault paths, protection zones, breaker duties, and selectivity criteria from an electrical single-line diagram.
- Suggested activity: evaluate instrument-transformer data and compare fuse, breaker, and relay operating characteristics.
- Suggested activity: calculate overcurrent and earth-fault settings and coordinate upstream and downstream time-current curves.
- Suggested activity: assemble settings, curves, test evidence, approvals, and troubleshooting actions into a Protection Coordination Study Pack.

FAQs

Who suits electrical protection coordination training and what does it assume?

Electrical protection coordination training suits engineering, protection, maintenance, commissioning, utility, and industrial technical professionals. It assumes familiarity with electrical equipment and single-line diagrams but not prior ownership of a coordination study.

How does protection coordination training differ from general power-system engineering training?

Protection coordination training focuses on fault duties, protection zones, instrument transformers, relay functions, device curves, settings, selectivity, tests, and misoperations. General power-system engineering training covers broader generation, transmission, distribution, load flow, stability, and equipment design topics.

What is selectivity in electrical protection coordination?

Selectivity is the ability of the protective device nearest a fault to operate while appropriate upstream devices remain closed. Engineers coordinate pickup levels, operating times, curves, zones, and device duties to achieve the intended isolation sequence.

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How do relay parameters support a protection coordination study?

Relay parameters define pickup thresholds, time delays, directional or zone behavior, restraint, and trip logic. A coordination study compares these values with fault currents, equipment limits, device curves, and upstream and downstream protection.

What evidence belongs in an electrical protection coordination study?

An electrical protection coordination study records network assumptions, fault calculations, device data, instrument-transformer inputs, relay settings, time-current curves, selectivity checks, test requirements, approvals, revisions, and unresolved engineering actions.

Conclusion

Participants take a Protection Coordination Study Pack back to work. It connects fault calculations, zones, instrument transformers, device characteristics, relay settings, time-current curves, selectivity checks, test evidence, and troubleshooting records. It changes isolated protection data into traceable settings decisions, coordinated clearing sequences, verified tests, and documented corrective actions.