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Basics for Protection Engineers (ET-BASPR)

Objectives

This seminar provides the electrical engineering fundamentals required to understand modern protection and control systems used in utility and industrial power networks. Participants will gain a comprehensive overview of the structure and operational behavior of electrical power systems, as well as the most important equipment used in energy supply networks.
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Special emphasis is placed on the physical phenomena associated with network faults and their effects on equipment and protection systems. This creates a solid foundation for understanding the tasks, functions, and requirements of protection devices and facilitates entry into advanced protection engineering training courses.
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Upon completion of the seminar, participants will be able to:
• Describe the structure and operation of electrical power supply networks.
• Assess typical network faults and their consequences.
• Understand and classify the main components of a power system.
• Explain the role of instrument transformers and switching devices.
• Understand the fundamentals behind the application and parameterization of protection relays.
• Comprehend the relationship between network operation, network faults, and protection concepts.

Target Group

• New protection engineers
• Commissioning and service engineers
• Design and engineering personnel
• Employees of utility companies
• Operations and maintenance personnel from industrial facilities
• Career changers with a basic electrical engineering background

Content

Fundamentals of Electrical Power Supply Networks
• Structure and design of transmission and distribution networks
• Power flow in transmission and distribution systems
• Generator, consumer, and network operator perspectives
• Network operation under normal and fault conditions
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Network Calculations and Power flow Conventions
• Fundamentals of power flow analysis
• Sign convention systems for generators and consumers
• Active, reactive, and apparent power
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Short-Circuit Currents and Network Faults
• Causes and effects of short circuits
• Short-circuit power and its significance
• Three-phase and unbalanced network faults
• Impact on equipment and network stability
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Neutral Grounding and Earthing Concepts
• Isolated, compensated, and solidly grounded networks
• Effects on earth-fault currents
• Application and function of arc suppression coils
• Importance for protection concepts
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Equipment in Power Supply Networks
• Overhead lines and cables
• Power transformers
• Arc suppression coils
• Circuit breakers and load-break switches
• Fuses
• Medium- and high-voltage switchgear
• Reactive power compensation systems
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Instrument Transformers in Protection Engineering
• Current transformers and voltage transformers
• Accuracy and protection class requirements
• Applications in metering, protection, and monitoring
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Power Quality and Network Disturbances
• Voltage quality and supply quality
• Harmonics and flicker
• Reactive power and compensation
• Effects on network operation and equipment

Prerequisites

• Basic knowledge of electrical engineering
• Understanding of fundamental electrical quantities and AC technology

Note

This training can be booked as VIRTUAL CLASSROOM Training too.

CONTACT
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Type

Face-to-face training

Duration

2 days

Language

en

Fee

1,740 EUR

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