



Electrical Power Systems for Non-Engineers Training Course

11 – 15 January 2027
Madrid (Spain)



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Introduction:

This Electrical Power Systems for Non-Engineers training course is meticulously designed for non-engineers who want to grasp the fundamentals and operational aspects of electrical power systems. It starts with traditional methods of electricity generation and progresses to the cornerstones of renewable energy electrical power generation.

In transmitting and distributing electrical power, we examine the pivotal roles of power transformers, circuit breakers, electric motors, and earthing systems. We also emphasize safety and the risks associated with electricity, which are crucial in all electrical installations.

Understanding the basic single-line diagram is crucial for comprehending the power flow of electrical installations. The focus on Alternating Current AC systems will cover essential electrical units such as voltage, current, power, power factor, and frequency for both single-phase and three-phase systems. A robust maintenance culture, supported by standard testing and measuring instruments, is vital in ensuring the reliability and security of an electrical power system.

Enhancing Electrical Power Systems Expertise:

Electrical engineering power systems are a critical domain that requires continuous learning and adaptation. This Electrical Power Systems for Non-Engineers Training Course offers those in electrical engineering basics the opportunity to upskill their proficiency in power system engineering, preparing them for the industry's complex and evolving demands. For a more immersive experience in electrical power system protection training, we recommend exploring dedicated training that delves into intricate safety and operational protocols.

Targeted Groups:

- Mechanical Engineers.
- Mechanical Engineering Technicians.
- Safety Officers.
- Civil Engineering Personnel.
- Administrative and Management Staff.

Course Objectives:

By the conclusion of this Electrical Power Systems for Non-Engineers Training Course, participants will be proficient in:

- Understanding the generation, transmission, and distribution of electricity.
- Analyzing grounding systems and electrical safety.
- Assessing the risks associated with electric shocks and arc flash hazards.
- Comprehending electrical faults and the corresponding protective devices.
- Getting acquainted with pivotal electrical equipment such as transformers, motors, and circuit breakers.

Targeted Competencies:

At the end of this Electrical Power Systems for Non-Engineers Training Course, the target competencies will be able to:

- Knowledge of the generation, transmission, and distribution of electricity.
- Understanding the various types of AC single-phase and three-phase network systems.
- Grasping the concept of power and power factor in an AC system.
- Acquiring insights into protection devices within an electrical installation.
- Awareness of electrical safety and the perils of electric shock.

Course Content:

Unit 1: The AC Network and Electric Shock Hazards:

- The foundation of generation, transmission, and distribution of electricity for both single-phase and three-phase.
- The diverse AC network configurations: star and delta.
- Understanding power essentials like voltage, current, impedance, and power factor.
- The vital importance of earthing systems within a network.
- Differentiating types of earthing systems and their applications.
- Deep dive into electrical safety and the hazards associated with electric shocks.

Unit 2: Operation of Various Types of Electrical Protection Devices:

- An array of fuses is suitable for low-voltage, medium-voltage, and high-voltage applications.
- The construction and operational principles behind Miniature Circuit Breakers MCB.
- The design and functionality of Molded Case Circuit Breakers MCCB.
- The mechanics of air circuit breakers and vacuum circuit breakers.
- SF6 circuit breakers.

Unit 3: Distribution Power Transformers and AC Motors:

- The constructional varieties and types of transformers alongside their functionalities.
- Functionalities of the transformer components.
- Cooling systems within transformers.
- The mechanisms of AC single-phase motors.
- Three-phase AC induction motors.
- A broad spectrum of starting methods for AC motors.

Unit 4: The Interpretation and Use of Drawings:

- The pivotal role played by electrical drawings in the industry.
- Deciphering symbols on a single-line diagram.
- Interpretative skills are required to comprehend electrical drawings.
- Tracing a single-line diagram.
- The procedures involved in identifying components in a single-line diagram.
- Designing and manipulating single-line diagrams effectively.

Unit 5: The Use of Common Test Equipment and Maintenance:

- Tools like digital multimeters
- Insulation resistance testers.
- Recognizing the importance and consequent significance of proper maintenance.
- Deploying various strategies.
- Types of maintenance within an electrical installation.

Unit 6: Introduction to Single Line Diagrams SLD:

- This unit introduces Single Line Diagrams SLD as a fundamental tool in understanding and designing electrical power systems.
- Define Single Line Diagrams and explain their purpose.
- Identify common symbols used in SLDs.
- Interpret basic Single Line Diagrams.