

ELECTRIC POWER SUBSTATION ENGINEERING

“Design, Operate, and Maintain Substations for Safe, Reliable, and Efficient Power Delivery.”

Schedule

Venue (In-house)	Fees
At Your Organization Premises	Ask For The Quotation

► **Available delivery methods:** In-House Training

Introduction

Power substations are the backbone of electrical transmission and distribution networks, enabling safe voltage transformation, protection, and reliable delivery of electricity. Proper design, operation, and maintenance of substations are critical to ensure system stability, minimize outages, and protect equipment and personnel.

The Electric Power Substation Engineering course equips engineers, technicians, and maintenance personnel with practical knowledge and skills to design, operate, and maintain substations. Participants will learn about substation components, protection schemes, control systems, and industry best practices for optimal performance and safety.

Objectives

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

- Understand the fundamentals and components of power substations.
- Design substation layouts and select appropriate equipment (transformers, switchgear, circuit breakers, busbars).
- Implement protection schemes and control systems for safe operation.
- Perform inspections, maintenance, and troubleshooting of substation equipment.
- Analyze system performance and optimize substation reliability and efficiency.
- Ensure compliance with safety standards, codes, and regulations.
- Apply best practices for operation, monitoring, and fault management.
- Integrate substations with transmission and distribution networks effectively.

Why Attend

This course is essential for engineers, technicians, and utility professionals responsible for the design, operation, and maintenance of substations. Participants will gain hands-on expertise to ensure safe, efficient, and reliable substation operations, reducing downtime and operational risks.

Target Audience

This course is suitable for:

- Electrical Engineers and Technicians
- Substation and Transmission Line Professionals
- Maintenance Supervisors and Reliability Engineers
- Control and Protection Engineers
- Utility Managers and Industrial Plant Electrical Teams
- Graduate Students in Electrical or Power Systems Engineering

Individual Benefits

- Gain practical skills in substation design, operation, and maintenance.
- Develop expertise in protection schemes, control systems, and equipment coordination.
- Enhance troubleshooting and problem-solving capabilities.
- Increase professional knowledge and career advancement opportunities.
- Build confidence in maintaining safe, reliable, and efficient substation operations.
- Learn to optimize system performance and reduce operational risks.

Organizational Benefits

- Ensure safe and reliable operation of substations and connected networks.
- Reduce downtime, maintenance costs, and operational risks.
- Build internal expertise in substation engineering and management.
- Enhance compliance with industry standards, codes, and safety regulations.
- Optimize substation efficiency and overall power system reliability.
- Support sustainable and cost-effective power distribution operations.

Instructional Methodology

The training employs a practical, hands-on approach through:

- Interactive lectures and substation design demonstrations
- Real-world case studies of substation operations and maintenance
- Step-by-step exercises on layout, equipment selection, and protection schemes
- Group workshops and collaborative problem-solving sessions
- Assignments focused on troubleshooting, performance optimization, and safety compliance
- Continuous feedback and Q&A sessions to reinforce learning

Course Outline

- Module 1: Introduction to Power Substations – Types, Components, and Functions
- Module 2: Transformers, Switchgear, and Bus Systems
- Module 3: Circuit Breakers, Relays, and Protective Devices
- Module 4: Substation Layout, Grounding, and Safety Practices
- Module 5: Control and Monitoring Systems in Substations
- Module 6: Maintenance Practices and Preventive Measures
- Module 7: Fault Analysis, Troubleshooting, and Corrective Actions
- Module 8: Substation Automation and SCADA Integration
- Module 9: Standards, Codes, and Regulatory Compliance
- Module 10: Capstone Project – Design, Operation, and Maintenance of a Complete Substation

Certification

Upon successful completion, participants will receive a Certificate in Electric Power Substation Engineering, validating their expertise in designing, operating, and maintaining safe, reliable, and efficient substations.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation's unique goals.

In-House / Customized Training

Interested in running this course for your team?

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