MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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FUNDAMENTALS OF ELECTRICAL SWITCHGEARS – THEORY & PRACTICAL

"Mastering Safe Operation, Design & Maintenance of Switchgear Systems"

Schedule

Date	Venue	Fees
08 – 10 Dec 2026	Doha, Qatar	USD 2495 per delegate

Introduction

Electrical switchgear plays a critical role in the protection, control, and isolation of electrical equipment. A solid understanding of switchgear types, design principles, and practical operation is essential for engineers and technicians tasked with ensuring electrical system reliability and safety.

This intensive 3-day course provides both theoretical knowledge and practical insights into the fundamentals of electrical switchgear. Participants will explore operational principles, safety protocols, testing techniques, and common troubleshooting approaches with a focus on real-world applications in industrial and commercial environments.

Objectives

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

- Understand the purpose, components, and classifications of switchgear
- Differentiate between low, medium, and high-voltage switchgear applications
- Apply safety protocols in the handling and maintenance of switchgear
- Interpret schematics and protection coordination
- Conduct basic diagnostics and functional testing of switchgear systems

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Why Attend

- To enhance your technical knowledge of switchgear operations and control systems
- To improve safety awareness in the installation and maintenance of electrical panels
- To prepare for troubleshooting and failure analysis of switchgear units
- To support compliance with electrical safety and performance standards
- To develop hands-on skills in working with circuit breakers, isolators, and protection devices

Target Audience

This program is designed for:

- Electrical engineers and technicians
- Maintenance and facility engineers
- Energy and utilities professionals
- Project engineers and field electricians
- Technical supervisors and safety inspectors

Individual Benefits

Key competencies that will be developed include:

- Functional understanding of switchgear technologies and classifications
- Proficiency in reading and interpreting single-line diagrams and wiring schematics
- Knowledge of insulation, arc-flash hazards, and protective relays
- Practical approaches to routine inspections, testing, and preventive maintenance
- Awareness of safety standards such as IEC, IEEE, and OSHA

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved uptime and safety in electrical systems through proper switchgear operation
- Enhanced asset longevity through effective maintenance and testing procedures
- Reduced risks of electrical failures and associated downtime
- Compliance with international safety and operational codes
- In-house capability to diagnose, troubleshoot, and resolve switchgear faults

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Overview of switchgear classifications, operations, and applications
- Case Studies – Real-life switchgear failures and solutions in various sectors
- Workshops – Hands-on practice with protection devices, interlocks, and breaker testing
- Peer Exchange – Discussion of site-specific challenges and best practices
- Tools – Checklists, safety protocols, maintenance logs, and diagnostic guides

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Course Outline

Detailed 3-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Electrical Switchgear

- Module 1: Switchgear Overview and Applications (07:30 – 09:30) • Functions of switchgear in electrical systems • Types: low, medium, and high voltage • Key components: circuit breakers, isolators, fuses, relays
- Module 2: Standards and Safety in Switchgear Operation (09:45 – 11:15) • IEC, IEEE, and OSHA guidelines • Arc flash risks and mitigation measures • Safety interlocks and grounding systems
- Module 3: Workshop – System Layout and Identification (11:30 – 01:00) • Interpreting single-line diagrams • Identifying equipment in actual switchgear panels • Safety checks before operation
- Module 4: Peer Exchange – Installation Practices (02:00 – 03:30) • Field challenges and quality assurance in switchgear installation • Cable termination and labeling standards

Day 2: Protection, Control, and Fault Management

- Module 5: Circuit Breakers and Relays (07:30 – 09:30) • Types of breakers: ACB, VCB, SF6, MCCB • Protection relays: types, operation, and settings • Coordination of breakers and relays
- Module 6: Fault Detection and Isolation Techniques (09:45 – 11:15) • Overcurrent, earth fault, and short-circuit protection • Isolating faults and minimizing service disruption • Trip curves and breaker selectivity
- Module 7: Workshop – Breaker Testing and Diagnosis (11:30 – 01:00) • Manual testing of circuit breakers • Megger and insulation resistance tests • Identifying contact wear and overheating
- Module 8: Case Study – Fault Incident Review (02:00 – 03:30) • Investigation of a real-world switchgear failure • Root cause analysis and corrective action plan

Day 3: Maintenance, Troubleshooting, and Modern Trends

- Module 9: Preventive Maintenance and Inspection (07:30 – 09:30) • Routine inspection checklists • Thermal imaging and condition monitoring • Lubrication, cleaning, and torque checks
- Module 10: Troubleshooting and Repairs (09:45 – 11:15) • Common faults in switchgear systems • Diagnostic tools and isolation steps • Spare parts and repair protocols
- Module 11: Workshop – Maintenance Planning Exercise (11:30 – 01:00) • Creating a preventive maintenance plan • Inventory of tools, spares, and documentation • Safety permits and lockout-tagout (LOTO) compliance
- Module 12: Future Trends in Switchgear (02:00 – 03:30) • Smart switchgear and digital monitoring • IoT integration and remote diagnostics • Energy-efficient switchgear solutions

Certification

Participants will receive a Certificate of Completion in Fundamentals of Electrical Switchgears – Theory & Practical, validating their understanding of key switchgear technologies, safety protocols, and practical troubleshooting techniques for modern electrical systems.

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.

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