MAWA EVENTS

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

Phone: +601116373203 | **Email:** info@mawaevents.net

CIRCUIT BREAKERS & SWITCHGEARS

"Design, Operation, and Maintenance for Electrical Safety and Reliability""

Schedule

Date	Venue	Fees (Face-to-Face)
15 – 19 Feb 2026	Doha, Qatar	USD 3495 per delegate
12 – 16 Apr 2026	Manama, Bahrain	USD 3495 per delegate
15 – 19 Jun 2026	Dubai, UAE	USD 3495 per delegate
02 – 06 Aug 2026	Muscat, Oman	USD 3495 per delegate
06 – 10 Sep 2026	Kuwait	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training, In-House Training

Introduction

Circuit breakers and switchgears are critical components of electrical power systems. Their proper selection, installation, and maintenance ensure system reliability, personnel safety, and asset longevity. As power networks grow more complex, understanding the technical and operational aspects of these devices is essential for electrical engineers and maintenance teams. This five-day training course is designed to provide deep insights into the operation, specification, testing, and maintenance of both low and high-voltage switchgears and circuit breakers. Participants will enhance their troubleshooting skills and gain confidence in managing modern power distribution systems.

Objectives

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

- Understand the types, construction, and working principles of circuit breakers and switchgears
- Interpret technical data and ratings for equipment selection
- Apply international standards and best practices in operation and maintenance
- Perform routine inspections and diagnostic testing
- Identify common faults and implement troubleshooting procedures
- Ensure safe switching, protection coordination, and load management
- Evaluate insulation and arc-quenching technologies.

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Why Attend

- Gain expert-level understanding of both HV and LV switchgear systems
- Learn practical testing and inspection procedures used in the field
- Improve the reliability and safety of your electrical installations
- Stay current with modern technologies, standards, and trends
- Reduce unplanned outages and costly equipment failures.

Target Audience

This program is designed for:

- Electrical Engineers and Technicians
- Maintenance Supervisors and Plant Engineers
- Utility and Substation Operators
- Safety Inspectors and Electrical Consultants
- Power System Design Engineers.

Individual Benefits

Key competencies that will be developed include:

- Equipment diagnostics and condition assessment
- Switching strategy and breaker coordination
- Fault analysis and response
- Regulatory and technical documentation interpretation
- Electrical risk mitigation

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved safety culture and operational compliance
- Extended equipment life and reduced replacement costs
- More effective outage planning and downtime response
- Strengthened technical capabilities across electrical teams
- Standardized maintenance and testing processes.

Instructional Methodology

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

- Technical Lectures – Concepts, diagrams, and design principles
- Case Studies – Field failures, maintenance records, root cause analysis
- Visual Demonstrations – Switchgear construction, breaker disassembly
- Group Work – Fault diagnosis and protection coordination exercises
- Interactive Q&A – Troubleshooting and knowledge reinforcement

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Course Outline

COURSE OUTINE

Detailed 5-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM Daily Format: 2–3 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Power Systems and Switchgears

- Module 1: Electrical Power System Overview (07:30 – 09:30)
- Basics of generation, transmission, and distribution
- Load types and system configurations
- Module 2: Switchgear Fundamentals (09:45 – 11:15)
- Classifications: LV, MV, HV switchgear
- Indoor vs. outdoor configurations
- Module 3: Circuit Breaker Principles (11:30 – 01:00)
- Operating principles and classifications
- AC vs. DC breakers and standard functions
- Module 4: IEC & IEEE Standards (02:00 – 03:30)
- Key standards and technical references

Day 2: Construction, Function & Arc Interruption

- Module 5: Circuit Breaker Types and Design (07:30 – 09:30)
- Air, oil, SF6, and vacuum circuit breakers
- Fixed vs. withdrawable breakers
- Module 6: Arc Interruption Mechanisms (09:45 – 11:15)
- Arc formation and quenching
- Arc chute and insulation materials
- Module 7: Operating Mechanisms (11:30 – 01:00)
- Spring-charged, magnetic, hydraulic actuation
- Module 8: Switchgear Components and Accessories (02:00 – 03:30)
- CTs, PTs, relays, and busbars

Day 3: Maintenance and Testing Procedures

- Module 9: Maintenance Planning (07:30 – 09:30)
- Inspection schedules and risk-based maintenance
- Module 10: Diagnostic Techniques (09:45 – 11:15)
- IR thermography, contact resistance, timing tests
- Module 11: Breaker Testing Methods (11:30 – 01:00)
- Primary/secondary injection, insulation resistance tests
- Module 12: Documentation and Reporting (02:00 – 03:30)
- Test forms, trends, and asset history tracking

Day 4: Faults, Safety & Coordination

- Module 13: Fault Types and Root Cause Analysis (07:30 – 09:30)
- Phase-to-phase, phase-to-ground, internal failures
- Module 14: Arc Flash Hazards and Safety (09:45 – 11:15)
- PPE, labeling, clearance, and safe racking procedures
- Module 15: Protection and Coordination (11:30 – 01:00)
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Relay and breaker coordination, time-current curves

- Module 16: Emergency Procedures and Isolation Protocols (02:00 – 03:30)
- Lockout/tagout, fault clearance, and system restoration

Day 5: Integration, Design, and Workshop

- Module 17: Load Studies and Breaker Sizing (07:30 – 09:30)
- Calculation methods and derating factors
- Module 18: System Layout and Design Considerations (09:45 – 11:15)
- Substation layouts, feeder arrangements
- Module 19: Case Study – Switchgear Failure Investigation (11:30 – 01:00)
- Fault analysis and corrective action planning
- Module 20: Final Workshop & Certification (02:00 – 03:30)
- Team analysis presentations and course wrap-up

Certification

Participants who complete the program will receive a Circuit Breakers & Switchgears, recognizing the development of practical and strategic financial expertise.

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? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**

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