

ELECTRICAL GROUNDING SYSTEMS AND HAZARDOUS AREA CLASSIFICATIONS

“Ensuring Electrical Safety, System Reliability, and Compliance in Hazardous Environments”

Schedule

Date	Venue	Fees (Face-to-Face)
02 - 06 Aug 2026	Doha - Qatar	USD 3495 per delegate

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

Introduction

Electrical grounding systems and hazardous area classifications are critical components of electrical safety, particularly in industries such as oil & gas, petrochemicals, power generation, and heavy manufacturing. Improper grounding or incorrect classification of hazardous areas can result in equipment damage, fire, explosions, and serious safety incidents.

This intensive 5-day training provides participants with comprehensive knowledge of grounding system design, installation, testing, and maintenance, along with a detailed understanding of hazardous area classification standards. The course emphasizes international codes, practical applications, and real-world case studies to ensure compliance, safety, and operational reliability in hazardous electrical environments.

Objectives

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

- Understand the fundamentals and importance of electrical grounding systems
- Design effective grounding and earthing systems for industrial facilities
- Apply international standards and codes related to grounding and hazardous areas
- Identify and classify hazardous areas accurately
- Select appropriate electrical equipment for hazardous locations
- Conduct grounding measurements, testing, and inspections
- Reduce electrical risks and improve workplace safety

Why Attend

- Enhance electrical safety and system reliability
- Gain practical knowledge of grounding and earthing design
- Ensure compliance with international electrical standards
- Reduce risk of fire, explosion, and equipment failure
- Improve inspection, testing, and maintenance practices
- Strengthen professional competence in hazardous area environments

Target Audience

This program is designed for:

- Electrical engineers and technicians
- Maintenance and reliability engineers
- HSE and safety professionals
- Project and commissioning engineers
- Oil & gas, petrochemical, and power plant personnel
- Electrical inspectors and consultants

Individual Benefits

Key competencies that will be developed include:

- Strong understanding of grounding and earthing principles
- Ability to assess and improve grounding system performance
- Knowledge of hazardous area classification standards
- Improved skills in equipment selection for hazardous locations
- Enhanced troubleshooting and safety awareness
- Professional growth in industrial electrical engineering

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved electrical safety and regulatory compliance
- Reduced incidents related to grounding failures
- Enhanced protection of personnel and assets
- Increased reliability of electrical systems
- Better risk management in hazardous environments
- Stronger safety culture across operations

Instructional Methodology

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

- Strategy Briefings – Electrical grounding concepts, hazardous area standards, and safety requirements
- Case Studies – Real-world incidents and lessons learned from grounding and hazardous area failures
- Workshops – Practical grounding design, calculations, and classification exercises
- Peer Exchange – Group discussions on industry challenges and best practices
- Tools – Grounding calculation sheets, classification diagrams, and inspection checklists

MAWA EVENTS

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Course Outline

Detailed 5-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: Fundamentals of Electrical Grounding

Module 1: Introduction to Electrical Grounding Systems (07:30 – 09:30)

- Purpose and importance of grounding
- Effects of improper grounding
- Types of grounding systems

Module 2: Grounding Standards and Codes (09:45 – 11:15)

- IEC, IEEE, NEC, and BS standards
- Regulatory and safety requirements

Module 3: Soil Resistivity and Ground Resistance (11:30 – 01:00)

- Soil characteristics and measurements
- Ground resistance calculations

Module 4: Workshop – Grounding Basics (02:00 – 03:30)

- Grounding system design examples

Day 2: Grounding System Design and Installation

Module 1: Industrial Grounding System Design (07:30 – 09:30)

- Substations, plants, and buildings
- Step and touch voltage considerations

Module 2: Equipment and Lightning Grounding (09:45 – 11:15)

- Equipment grounding methods
- Lightning protection grounding

Module 3: Installation Practices and Materials (11:30 – 01:00)

- Grounding conductors, rods, and grids
- Corrosion protection

Module 4: Workshop – Grounding Design (02:00 – 03:30)

- Practical design and layout exercises

Day 3: Testing, Inspection, and Maintenance

Module 1: Grounding System Testing Methods (07:30 – 09:30)

- Fall-of-potential and clamp methods
- Test equipment and procedures

Module 2: Inspection and Maintenance (09:45 – 11:15)

- Periodic inspection requirements
- Documentation and reporting

Module 3: Troubleshooting Grounding Issues (11:30 – 01:00)

- Common grounding problems
- Corrective actions

Module 4: Case Study – Grounding Failures (02:00 – 03:30)

- Analysis of real incidents

Day 4: Hazardous Area Classification

Module 1: Introduction to Hazardous Areas (07:30 – 09:30)

- Explosion risks and ignition sources
- Gases, vapors, and dust hazards

Module 2: Hazardous Area Classification Standards (09:45 – 11:15)

- IEC, NEC, ATEX systems
- Zone and Division concepts

Module 3: Area Classification Methodology (11:30 – 01:00)

- Extent of zones and ventilation effects
- Documentation and drawings

Module 4: Workshop – Area Classification (02:00 – 03:30)

- Practical classification exercises

Day 5: Equipment Selection and Safety Management

Module 1: Electrical Equipment for Hazardous Areas (07:30 – 09:30)

- Types of protection (Ex d, Ex e, Ex i, etc.)
- Equipment selection criteria

Module 2: Installation and Inspection Requirements (09:45 – 11:15)

- Wiring systems and protection methods
- Inspection and certification

Module 3: Risk Management and Compliance (11:30 – 01:00)

- Safety management systems
- Incident prevention and control

Module 4: Course Review and Best Practices (02:00 – 03:30)

- Key lessons learned
- Final review and action planning

Certification

Participants will receive a Certificate of Completion in Electrical Grounding Systems and Hazardous Area Classifications, validating their technical knowledge and practical competence in grounding design, hazardous area classification, and electrical safety management.

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