MAWA EVENTS

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

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CATHODIC PROTECTION (CP) – DESIGN AND SELECTION

""Protecting Critical Infrastructure Through Effective CP System Design and Application""

Schedule

Date	Venue	Fees (Face-to-Face)
05 – 09 Oct 2026	London – UK	USD 3495 per delegate

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

Introduction

Corrosion is one of the most significant threats to the long-term integrity and safety of metallic structures. Cathodic Protection (CP) is a proven electrochemical technique used globally to mitigate corrosion risks in pipelines, tanks, offshore platforms, and other critical infrastructure.

This intensive 5-day course focuses on the design, selection, and implementation of CP systems, including both impressed current and galvanic systems. Participants will gain comprehensive technical knowledge and practical skills to ensure optimal CP system performance, regulatory compliance, and asset longevity across various industries.

Objectives

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

- Understand the principles and electrochemical basis of cathodic protection
- Differentiate between types of CP systems and their applications
- Design CP systems for pipelines, tanks, marine structures, and facilities
- Select appropriate materials, anodes, power supplies, and monitoring tools
- Apply CP design standards, modeling, and field testing techniques

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Why Attend

- Protect critical infrastructure from costly corrosion failures
- Gain confidence in designing CP systems for various environments
- Ensure compliance with industry standards like NACE, ISO, and DNV
- Understand how to troubleshoot and optimize CP system performance
- Expand your career potential in pipeline integrity, corrosion control, and asset management

Target Audience

This program is designed for:

- Corrosion Engineers and Specialists
- Pipeline, Facility, and Offshore Engineers
- Maintenance and Integrity Managers
- CP Technicians and Designers
- Inspection, QA/QC, and Project Engineers

Individual Benefits

Key competencies that will be developed include:

- CP design methodology and current requirement calculations
- Selection of CP materials and configuration for various environments
- Interpretation of potential measurements and CP performance data
- Understanding of AC/DC interference, grounding, and system integration
- Ability to apply international CP design codes and standards

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved corrosion protection and infrastructure reliability
- Reduced maintenance costs and unplanned failures
- Compliance with safety and environmental regulations
- Enhanced project design and field implementation accuracy
- Increased operational life of pipelines, storage, and marine assets

Instructional Methodology

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

- Strategy Briefings – CP fundamentals, system types, and corrosion mechanisms
- Case Studies – CP projects for pipelines, offshore platforms, and tanks
- Workshops – Current requirement calculations, CP system layout, and material selection
- Peer Exchange – Discussions on regional and environmental design challenges
- Tools – CP design templates, circuit models, NACE/ISO standards reference

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Course Outline

DETAILED 5-DAY COURSE OUTLINE

Training Hours: 07:30 AM – 03:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Fundamentals of Corrosion and CP Principles

- Module 1: Introduction to Corrosion and Control Methods (07:30 – 09:30) • Types and causes of corrosion in metallic structures • Corrosion rate factors and electrochemical reactions • Overview of protection techniques: coatings, inhibitors, CP
- Module 2: Principles of Cathodic Protection (09:45 – 11:15) • Electrochemical theory and CP mechanism • Potential measurement and protection criteria • Impressed current vs galvanic CP systems
- Module 3: CP System Components (11:30 – 01:00) • Anodes, cables, rectifiers, reference cells • Backfill materials and current distribution
- Module 4: Workshop – Basics of CP Circuit Design (02:00 – 03:30) • Simple circuit modeling and voltage drop calculations

Day 2: Design of Galvanic CP Systems

- Module 5: Galvanic CP for Buried Structures (07:30 – 09:30) • Zinc, magnesium, and aluminum anode properties • Anode sizing and spacing considerations
- Module 6: Soil Resistivity and Current Requirements (09:45 – 11:15) • Soil testing techniques and resistivity mapping • Calculating required protection current
- Module 7: CP for Tanks and Isolated Assets (11:30 – 01:00) • Underground storage and tank bottom protection • Galvanic CP installation and monitoring
- Module 8: Workshop – Galvanic System Sizing (02:00 – 03:30) • Anode calculation exercises using design scenarios

Day 3: Impressed Current CP System Design

- Module 9: Impressed Current CP System Layout (07:30 – 09:30) • Design options for pipelines, jetties, and offshore structures • Current density, coating condition, and environmental effects
- Module 10: Power Supplies and Rectifier Design (09:45 – 11:15) • AC/DC power systems, solar integration, and remote monitoring • Rectifier selection, grounding, and surge protection
- Module 11: Design Standards and Protection Criteria (11:30 – 01:00) • NACE SP0169, ISO 15589, and DNV-RP-B401 • Criteria for steel, concrete, and buried structures
- Module 12: Workshop – ICCP Layout and Calculations (02:00 – 03:30) • Designing a system for a pipeline or offshore structure

Day 4: Advanced Considerations and Monitoring Techniques

- Module 13: Interference, Shielding, and Stray Currents (07:30 – 09:30) • DC/AC interference, electrical bonding, and mitigation • Shielded regions and troubleshooting
- Module 14: Monitoring, Testing, and Maintenance (09:45 – 11:15) • Portable instruments, data logging, and permanent monitoring • Inspection frequency and accuracy
- Module 15: CP Data Interpretation and Troubleshooting (11:30 – 01:00) • Potential readings, depolarization curves, and voltage drops • Common field issues and resolution techniques
- Module 16: Workshop – Field Data Analysis Exercise (02:00 – 03:30) • Evaluation of test data and reporting

Day 5: Practical Application and Project Integration

- Module 17: CP Project Lifecycle (07:30 – 09:30) • From feasibility to detailed design and commissioning • Stakeholders, documentation, and coordination
- Module 18: CP Integration in Asset Integrity Programs (09:45 – 11:15) • Linking CP with coatings, inspections, and risk assessment • Digital twins and CP monitoring platforms
- Module 19: Final Design Review and Exam (11:30 – 01:00) • Participant-led review of sample CP designs • Knowledge check or certification assessment
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Module 20: Wrap-Up and Certification (02:00 – 03:30) • Group feedback, action planning, and certificate distribution

Certification

Participants will receive a Certificate of Completion in Cathodic Protection – Design and Selection, validating their expertise in designing, evaluating, and selecting CP systems in accordance with international engineering and corrosion control standards.

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**