MAWA EVENTS

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

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CATHODIC PROTECTION SYSTEM IN OIL AND GAS EXPLORATION INDUSTRY

"Protecting Infrastructure, Extending Asset Life — Master the Science and Application of Cathodic Protection in Oil & Gas Systems."

Schedule

Venue (InHouse)	Fees
At Your Organization Premises	Ask For The Quotation

Introduction

Corrosion is one of the most critical challenges faced by the oil and gas industry. Pipelines, offshore structures, storage tanks, and other metallic components are continuously exposed to harsh environments that accelerate corrosion, leading to potential leaks, failures, and financial losses. Effective corrosion control through Cathodic Protection (CP) is essential to ensure operational safety, environmental integrity, and long-term asset sustainability.

The Cathodic Protection System in Oil and Gas Exploration Industry course provides an in-depth understanding of CP principles, design, installation, monitoring, and maintenance. Participants will explore both sacrificial anode and impressed current systems, learning how to evaluate corrosion risks, select appropriate materials, and ensure compliance with international standards such as NACE, ISO, and ASTM.

This comprehensive program bridges theoretical fundamentals with practical applications, equipping engineers and technical professionals with the expertise to design, manage, and maintain effective cathodic protection systems across upstream, midstream, and downstream operations.

Objectives

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

- Understand the principles of electrochemical corrosion and the fundamentals of cathodic protection.
- Identify corrosion mechanisms and their effects on oil and gas assets.
- Differentiate between sacrificial anode and impressed current systems.
- Design and implement CP systems for pipelines, tanks, and offshore structures.
- Perform field measurements and evaluate protection effectiveness.
- Interpret potential readings, polarization data, and current requirements.
- Apply NACE and ISO standards in CP design and monitoring.
- Troubleshoot common problems and optimize system performance.
- Develop inspection, maintenance, and monitoring programs for long-term reliability.

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Why Attend

The oil and gas industry depends heavily on the integrity of its assets. Corrosion-related failures can cause catastrophic incidents, environmental pollution, and costly downtime. Mastering the principles and applications of cathodic protection empowers professionals to prevent such losses, ensuring continuous, safe, and efficient operations.

This training offers an excellent balance of theory and hands-on knowledge. Participants will learn to evaluate corrosion risks, design practical protection systems, and apply advanced techniques for monitoring and maintenance. Whether you are an engineer, inspector, or maintenance specialist, this course will strengthen your expertise in protecting valuable infrastructure from corrosion damage.

Target Audience

This course is designed for:

- Corrosion Engineers and Technicians
- Maintenance and Integrity Engineers
- Pipeline and Asset Integrity Managers
- Offshore and Onshore Facility Engineers
- Inspection and Quality Control Personnel
- Project Engineers and Construction Supervisors
- HSE and Operations Staff involved in corrosion management
- Professionals in oil, gas, petrochemical, and energy sectors

Individual Benefits

- Gain a complete understanding of cathodic protection theory and applications.
- Learn to design and manage CP systems according to industry standards.
- Enhance skills in identifying, measuring, and mitigating corrosion.
- Improve your ability to troubleshoot field problems and optimize system performance.
- Increase your professional credibility and career prospects in the oil and gas sector.
- Gain confidence in applying advanced corrosion prevention techniques in real-world environments.

Organizational Benefits

- Enhance asset integrity and reduce maintenance and replacement costs.
- Improve operational safety and minimize risk of leaks or system failures.
- Achieve compliance with international corrosion prevention standards.
- Extend the lifespan of pipelines, tanks, and offshore assets.
- Reduce downtime and enhance productivity through preventive maintenance.
- Build internal technical capability and reduce dependency on external consultants.

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Instructional Methodology

This training combines theoretical instruction, interactive learning, and real-world applications to ensure maximum knowledge retention. The methodology includes:

- Detailed theoretical presentations supported by visual diagrams and case studies.
- Interactive classroom discussions and group problem-solving.
- Hands-on exercises in CP design and measurement techniques.
- Practical examples from pipeline, tank, and offshore corrosion protection projects.
- Use of field instruments and simulated testing environments.
- Review of industry codes, standards, and best practices.
- Continuous assessment, feedback, and Q&A sessions to address participant challenges.

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Course Outline

Module 1: Introduction to Corrosion and Cathodic Protection

- Basics of corrosion and electrochemical reactions
- Types of corrosion in oil and gas environments
- Role of cathodic protection in corrosion prevention

Module 2: Principles of Cathodic Protection

- Fundamentals of electrochemical protection
- Potential measurement and reference electrodes
- Mechanism of protection and current flow

Module 3: Types of Cathodic Protection Systems

- Sacrificial (Galvanic) Anode Systems – design, materials, and applications
- Impressed Current Systems – components, rectifiers, and control mechanisms
- Comparison of systems and selection criteria

Module 4: CP System Design and Installation

- Design parameters for pipelines, tanks, and marine structures
- Current density calculation and potential criteria
- Anode selection, placement, and spacing
- Electrical continuity and isolation techniques

Module 5: Field Measurement and Monitoring Techniques

- Measurement of pipe-to-soil potentials
- Current and voltage surveys
- Interference testing and mitigation methods
- Data recording and interpretation

Module 6: Maintenance and Troubleshooting

- Identifying and correcting CP failures
- Rectifier and anode system maintenance
- Common faults and their solutions
- Optimizing system performance for extended service life

Module 7: Advanced CP Applications

- Offshore platforms, subsea pipelines, and storage tank protection
- Integration of CP with coatings and corrosion inhibitors
- Monitoring with remote and automated systems

Module 8: Standards, Safety, and Compliance

- Overview of NACE, ISO, DNV, and ASTM standards
- Safety considerations in CP system installation and maintenance
- Environmental compliance and regulatory guidelines

Module 9: Case Studies and Practical Workshop

- Analysis of real-life CP failures and success stories
- Interactive exercises in system design and problem-solving
- Practical demonstration of CP survey equipment and testing methods

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Certification

Upon successful completion of the course, participants will receive a Certificate in Cathodic Protection System in Oil and Gas Exploration Industry, recognizing their technical competence and understanding of corrosion control strategies. The certification validates their ability to design, monitor, and maintain cathodic protection systems in compliance with international standards, supporting both professional and organizational excellence in corrosion management.

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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