# Corrosion Control in Oil and Gas Facilities Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | General Training | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Corrosion control in oil and gas facilities is a critical engineering discipline that ensures the integrity, safety, and operational reliability of upstream, midstream, and downstream assets. With increasing global energy demand, aging infrastructure, and harsh operating environments, corrosion-related failures remain one of the leading causes of pipeline leaks, equipment degradation, and unplanned shutdowns. Corrosion Control in Oil and Gas Facilities Training Course provides a comprehensive understanding of corrosion mechanisms, integrity management, asset protection strategies, cathodic protection systems, and advanced monitoring technologies used in modern oil and gas operations.

Participants will gain practical and theoretical insights into corrosion prevention engineering, materials selection, chemical treatment programs, risk-based inspection (RBI), and digital corrosion monitoring systems. The course integrates real-world case studies from offshore platforms, refineries, and pipeline networks, enabling professionals to develop robust corrosion mitigation strategies aligned with international standards such as NACE, API 571, API 580, and ISO 21457. This program is designed to enhance operational efficiency, extend asset life, and reduce lifecycle costs through advanced corrosion control practices.

## Programme Curriculum

**Corrosion Control in Oil and Gas Facilities Training Course**

**Introduction**

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Facilities Training Course provides a comprehensive understanding of corrosion mechanisms, integrity management, asset protection strategies, cathodic protection systems, and advanced monitoring technologies used in modern oil and gas operations.

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**Course Duration**

5 days

**Course Objectives**

1. Understand corrosion science and electrochemical mechanisms in oil and gas systems
2. Identify uniform, pitting, galvanic, and microbiologically influenced corrosion (MIC)
3. Apply corrosion risk assessment (CRA) and risk-based inspection (RBI) methodologies
4. Design and evaluate cathodic protection systems
5. Implement corrosion monitoring techniques and smart sensor technologies
6. Optimize chemical injection and corrosion inhibitor programs
7. Select appropriate corrosion-resistant alloys
8. Interpret pipeline integrity management data and inspection reports
9. Apply API 571 damage mechanisms in failure analysis
10. Develop asset integrity management systems (AIMS)
11. Evaluate coating systems and surface protection technologies
12. Reduce downtime using predictive maintenance and digital twin models
13. Ensure compliance with NACE MR0175 / ISO 15156 sour service standards

**Target Audience**

1. Corrosion engineers and integrity engineers
2. Pipeline and process engineers
3. Maintenance and reliability engineers
4. Inspection and QA/QC professionals
5. Offshore and onshore facility operators
6. Petroleum engineering graduates and trainees
7. HSE and risk management officers
8. Asset integrity and plant managers

**Course Modules**

**Module 1: Fundamentals of Corrosion in Oil & Gas Systems**

- Electrochemical corrosion principles and thermodynamics
- Types of corrosion in upstream and downstream operations
- Environmental factors-temperature, salinity, CO?, H?S
- Flow-induced corrosion and erosion-corrosion interaction
- Case study: Pipeline failure due to CO? corrosion in offshore production line

**Module 2: Materials Selection & Corrosion-Resistant Alloys**

- Carbon steel vs stainless steel performance
- Duplex and super duplex stainless steels applications
- Material degradation in sour service environments
- NACE MR0175 compliance requirements
- Case study: Material failure in gas sweetening unit due to improper alloy selection

**Module 3: Cathodic Protection Systems Design**

- Sacrificial anode systems design principles
- Impressed current cathodic protection (ICCP) systems
- Groundbed design and current distribution
- CP system monitoring and maintenance
- Case study: Underground pipeline protection failure due to poor CP current distribution

**Module 4: Corrosion Inhibitors & Chemical Treatment Programs**

- Types of corrosion inhibitors
- Injection system design and optimization
- Water treatment and oxygen scavengers
- Monitoring inhibitor efficiency in real time
- Case study: Refinery heat exchanger corrosion due to ineffective chemical dosing

**Module 5: Coating Systems & Surface Protection**

- Anti-corrosion coatings and linings
- Surface preparation standards
- FBE, epoxy, polyurethane coating systems
- Coating failure mechanisms and blistering
- Case study: Offshore platform structural corrosion due to coating breakdown

**Module 6: Corrosion Monitoring & Inspection Technologies**

- Ultrasonic testing (UT), radiography, and smart pigging
- Corrosion coupons and electrical resistance probes
- Digital corrosion monitoring and IoT sensors
- Data analytics for predictive corrosion trends
- Case study: Early detection of pipeline thinning using intelligent pigging

**Module 7: Risk-Based Inspection (RBI) & Integrity Management**

- API 580/581 RBI methodology
- Probability and consequence of failure modeling
- Inspection planning optimization
- Asset integrity management systems (AIMS)
- Case study: Refinery RBI implementation reducing inspection costs by 30%

**Module 8: Failure Analysis & Advanced Corrosion Mechanisms**

- API 571 damage mechanism classification
- MIC (microbiologically influenced corrosion)

- Stress corrosion cracking (SCC) and hydrogen embrittlement
- Root cause analysis (RCA) methodologies
- Case study: Stress corrosion cracking in high-pressure gas pipeline

### Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

**Register as a group from 3 participants for a Discount**

**Send us an email: info@fineskilltrainingcenter.org or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**f.** Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

## Upcoming Scheduled Sessions

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Online | $1,000 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com