

Introduction:

This extensive training program is designed to provide professionals working in the gas, oil, and water industries with advanced knowledge and practical skills in corrosion control. The course covers theoretical foundations, real-world applications, and the most current technologies for corrosion prevention and management. By the conclusion of this training, participants will have the expertise needed to effectively combat corrosion, which significantly reduces maintenance expenses and extends the operational life of equipment.

Understanding and managing corrosion is vital within the gas, oil, and water sectors. This course directly addresses the complex challenges posed by corrosion in these fields. Proficient corrosion control ensures the durability and structural integrity of infrastructure, which is essential for preventing hazardous incidents, maintaining workplace safety, and achieving efficient operations.

In the oil and gas industry, corrosion often leads to costly operational disruptions and environmental risks. Therefore, establishing structured corrosion control programs is critical for protecting assets, improving reliability, and prolonging equipment service life. Implementing corrosion management in oil systems and corrosion management in water systems is both a safety measure and a cost-saving strategy.

This training course focuses on metallurgy and its role in corrosion control in oil and gas production. Participants will explore the properties of engineering materials, their susceptibility to corrosion, and systematic protection techniques designed to prevent premature material degradation.

Corrosion control includes a wide range of technical methods for preventing or slowing down corrosion. This involves careful selection of materials, engineering design considerations, protective coatings, corrosion inhibitors, and cathodic protection methods. The course provides in-depth learning of these areas to strengthen participants' ability to manage corrosion effectively.

By mastering these concepts, participants will develop a high level of knowledge and practical skills in corrosion management, positioning them for certifications and growth as recognized specialists in corrosion engineering.

Targeted Groups:

- Petroleum engineers
- Welding engineers
- Process engineers
- Inspectors and inspection supervisors
- Equipment engineers

- Maintenance engineers and planners
- Design engineers
- Representatives from service companies

Course Objectives:

Upon completion of this corrosion control training program, participants will be able to:

- Examine the materials of construction commonly used in gas, oil, and water operations
- Gain a thorough understanding of corrosion theories and mechanisms
- Identify common types of corrosion that affect oil, gas, and water systems
- Learn about monitoring and inspection techniques for corrosion control
- Apply practical methods to manage corrosion, including strategies for corrosion in water systems

Targeted Competencies:

- Metallurgy and properties of engineering materials
- The financial impact of corrosion damage across industries
- A complete understanding of corrosion mechanisms in oil, gas, and water operations
- Development of effective corrosion control and prevention programs
- Use of advanced methods for corrosion monitoring

Course Content:

Unit 1: Construction Material Grades and Principles of Corrosion Engineering

- Properties of engineering materials, with emphasis on metallurgy
- Destructive material testing methods
- Material identification in accordance with the American Petroleum Institute Specification Five Line Pipe and the American Society of Mechanical Engineers Code
- Economic impacts of corrosion and the role of corrosion engineering
- Basic principles of corrosion theory and corrosion measurement techniques

Unit 2: Understanding Types of Corrosion

- Introduction to galvanic corrosion
- Identification of localized or pitting corrosion
- Effects of stray electrical currents on corrosion
- Soil-related corrosion

- Mechanisms behind crevice corrosion
- Microbiologically Induced Corrosion and its challenges

Unit 3: Further Exploration of Types of Corrosion

- Mechanisms of wet hydrogen sulfide corrosion
- Corrosion under insulation
- Issues caused by corrosion under support structures
- Flow-assisted corrosion also referred to as erosion corrosion
- Chloride stress corrosion cracking
- Intergranular corrosion and preventive approaches

Unit 4: Corrosion Control in Gas, Oil and Water Fields

- Protective design alterations to prevent corrosion
- Methods of active cathodic protection using sacrificial anodes
- Application of cathodic protection through impressed current systems
- Passive protection using coatings
- Application of various protective paint systems
- Utilization of inhibitors in corrosion control

Unit 5: Corrosion Monitoring in Gas, Oil and Water Fields

- Ultrasonic thickness measurement techniques
- Radiographic testing for corrosion detection
- Use of corrosion coupons for monitoring
- Application of electronic probes
- Intelligent pigging technology
- Incorporating risk-based inspection methods that lead to certification in corrosion control and advanced corrosion engineering training