

GLOBAL EXPERTS INSTITUTE FOR TRAINING.  
ISO 9001-2008 TRAINING PROVISION CERTIFIED

## Corrosion Control and Mitigation

### Schedule Dates:

Start Date	End Date	Place
19 Feb 2024	23 Feb 2024	Istanbul – Melas Hotel

### Program Introduction:

The production of gas and oil is often accompanied by water and acid gases, such as (H<sub>2</sub>S) and (CO<sub>2</sub>) are often present in produced fluids. These increase the corrosivity of the process, which can significantly impact the safe operating life of pipes and equipment. Additionally, the build-up of corrosion and bacterial by-products on the equipment walls can cause problems with the equipment's operation.

The potential consequences of internal and external corrosion represent both safety and economic concerns to various sectors of the industry. Corrosion is fought by a complex system of monitoring, preventative repairs and careful use of materials.

This intensive training course examines the types of corrosion and corrosion control in the gas, oil and water industry and provides an overview of specific process descriptions, and focuses on the examination and identification of metallurgical problems in process units and methods of corrosion monitoring, control and damage reduction.

This training course will feature:

- Fundamental corrosion principles and mechanisms
- Types of corrosion that are related to the oil, gas and water
- Materials of Construction for process applications
- Corrosion Monitoring and inspection Methods
- Aspects of Corrosion inspection and anti-corrosion management and mitigation.

### Program Objective:

- ✓ Understand the basic principles of corrosion and its mechanisms
- ✓ Learn about the different types of corrosion, related to oil, gas and water  
Understand the application of corrosion protection techniques including cathodic protection, coatings and inhibitors
- ✓ Have a knowledge of basic metallurgical considerations and Materials of Construction for corrosion resistance
- ✓ Recognize and define corrosion for applications and equipment related to oil, gas and water

- ✓ Learn about corrosion inspection and monitoring techniques and methods of corrosion mitigation

### Who should attend?

This training course is geared towards; personnel wishing to increase their knowledge and understanding of corrosion in the refining industry, including:

- Process Engineers
- Inspectors and Inspection Supervisors
- Equipment Engineers
- Maintenance Engineers and Planners
- Design Engineers
- Service Company Representatives

## Program Outlines

### *Day One*

#### **Fundamentals of Corrosion Principles**

Competency Description: Participants need to gain a sound understanding of corrosion mechanisms and key factors that drive the corrosion process.

#### **Key behaviors**

- Key principles of corrosion
- Elements of corrosion
- Factors that influence corrosion

#### **Topics to be covered**

- Introduction to corrosion and corrosion failure potential
- Requirements of corrosion

- Electro chemical cells
- Corrosion mechanisms
- Corrosion rates
- Worked examples

### *Day Two*

#### **Types of Corrosion in the Refinery Industry, related to Oil, Gas and Water**

**Competency Description:** The description and comprehensive understanding of the main types of corrosion that are typically found in the oil, gas and water industries.

#### **Key behaviors**

- Key principles of specific types of corrosion
- Practical examples
- Factors that influence these types of corrosion
- Relevant and specific methods of corrosion reduction and control

#### **Topics to be covered**

- Uniform corrosion
- Pitting Corrosion
- Erosion Corrosion
- Crevice Corrosion
- Corrosion Under Lining
- Bimetallic Corrosion

### *Day Three*

#### **Types of Corrosion in the Refinery Industry, related to Oil, Gas and Water (Continued)**

**Competency Description:** Continuation from Day 3 - The description and comprehensive understanding of the main types of corrosion that are typically found in the oil, gas and water industries.

#### **Key behaviors**

- Key principles of specific types of corrosion
- Practical examples
- Factors that influence these types of corrosion
- Relevant and specific methods of corrosion reduction and control

#### **Topics to be covered**

- H<sub>2</sub>S, CO<sub>2</sub>, influenced corrosion
- Types of Hydrogen related cracking
- Naphthenic Acid Corrosion
- Carbonate Cracking (CC)
- Chlorine Stress Corrosion Cracking
- Microbiologically Induced Corrosion (MIC)

### *Day Four*

#### **Materials of Construction for Refinery Applications**

**Competency Description:** A comprehensive Introduction to the main types of metals that are typically found in the oil, gas and water industries and their properties with particular attention and examples to corrosion behavior. They include ferrous alloys, non-ferrous alloys and polymeric materials.

### **Key behaviors**

- Properties of steel
- Main types and corrosion applications of steel
- Relevant corrosion applications of non-ferrous alloys
- Relevant polymeric materials and applications to corrosion prevention and control

### **Topics to be covered**

- Common Materials in the Refinery Industry
- Carbon and alloy Steels
- Stainless steels
- Nickel based alloys
- Polymeric materials
- Selecting the proper material for the application

### ***Day Five***

#### **Corrosion Control, Protection and Monitoring**

**Competency Description:** Participants need to gain a sound understanding of the main methods and key factors of reducing and controlling the corrosion process, with emphasis on practical examples.

### **Key behaviors**

- Key principles of corrosion mitigation and control
- Types of corrosion control
- Advantages and disadvantages
- Practical examples

### Topics to be covered

- Cathodic protection
- Coatings and linings
- Inhibitors
- Corrosion coupons and probes
- Intelligent Pigs
- Overview of API 579

### Training Methodology:

- Slide presentations
- Interactive discussion
- Simulations and Gamification
- Online Video material

### Cost Quotation in Kuwaiti Dinars

#### The total cost includes:

- Instructor(s) expenses
- Training materials
- Certification
- Lunch Buffett

**Total Cost: 1450 KD per Participant**

( One Thousand Four Hundred Fifty Kuwaiti Dinar )