



*Process & Chemical Engineering Training Course:*

## ***CORROSION CONTROL AND PREVENTION***

*From 25/12/2022 to 29/12/2022*

*City Seasons Hotel, Dubai, UAE*

*3950 \$ (10% Special Discount for Groups)*

### ***Course Overview***

This 5 days corrosion control and prevention course covers multi aspects of corrosion control and its prevention in oil and gas production. The course will enable participants to establish a solid foundation in corrosion before moving on to advanced and professional topics. Exercises, hands-on practical sessions and experiments throughout the course will help participants understand the concepts and fundamentals important to corrosion. It provides an excellent avenue for corrosion practitioners, designers, technical managers, inspection and maintenance engineers, quality control personnel and those involved in failure analysis to update their appreciation of corrosion and the awareness of the emerging technologies for corrosion control and prevention.

### ***Course Methodology***

Training at Abar Solutions is undertaken through two approaches—theoretical and practical. Theory is delivered by a highly experienced professional from the related domain. Practical training is encouraged through sample projects and assignments. Role-plays encourage active trainee participation in the program. Trainees are also encouraged to share related experiences and issues at their workplace, and these are discussed in detail to draw relevance to the training content.

### ***Course Objectives***

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

- Examine the impact of corrosion on oil and gas production facilities and its consequences.
- Learn the type of corrosion in hydrocarbon production.
- Assess the Driving Force for Corrosion in hydrocarbon production.
- Understand the forms of corrosion in Specific Environments.
- Uncover the methods of corrosion control, protection and monitoring.
- Understand the application of protective coatings, inhibitors and cathodic protection.
- Review material selection options for facilities.
- Understand the process for a corrosion risk assessment.

## ***The Course Content & Outline***

### **Introduction to Corrosion and Corrosion Control**

- What is corrosion?
- Definitions of Corrosion Terminology.
- Basic Concepts in Corrosion.
- Cost of Corrosion.
- Factors Influencing Corrosion.

### **Corrosion Mechanisms**

- Principles of Electrochemistry.
- Faraday's Law.
- Cathodic and Anodic processes.
- Cell Potentials.
- Corrosion Tendency and Electrode Potentials.

### **Thermodynamics of Corrosion**

- Free Energy.
- Standard Electrode Potentials.
- Nernst Equation.
- Electrochemical and Galvanic Series.
- Acidity and Alkalinity (pH).
- Pourbaix Diagrams of Various Metals.

### **Electrochemical Kinetics of Corrosion**

- Polarization and Overvoltage.
- Activation Polarization.
- Concentration Polarization.
- Anodic and Cathodic Polarization.
- Evens Diagram.
- Corrosion Potential and Corrosion Rate.
- Passivity and Passivators.

### **Types of Corrosion: Uniform Corrosion**

- Atmospheric Corrosion & Underground or Soil Corrosion.
- High Temperature (Hot) Corrosion.

### **Types of Corrosion: Non-uniform or Localized Corrosion**

- Galvanic Corrosion & Pitting.
- Crevice Corrosion.
- Intergranular Corrosion.
- Selective Leaching.
- Erosion Corrosion.
- Hydrogen Embrittlement.
- Stress Corrosion Cracking (SCC) and Corrosion Fatigue (CF).

### **Corrosion in Specific Materials**

- Corrosion of Iron and Steel, Nickel, Aluminum, Titanium and Superalloys.
- Polymer and Ceramic Materials.

### **Corrosion Prevention and Control**

- Alteration of Environment.
- Materials Selection.
- Proper Design.

### **Corrosion Prevention and Control**

- Protective Coating and Inhibitors.
- Cathodic and Anodic Protection

### **Corrosion Testing, Monitoring and Inspection**

- Laboratory Tests.
- Pilot-plant tests.
- Field Test.

### **Failure Analysis and Techniques for Diagnosis of Corrosion Failures**

- Techniques for Diagnosing Corrosion Failures.
- Analysis of Corrosion Failures.
- Case Studies of Corrosion Failures.

### **Corrosion Issues in Specific Industries**

- Power Generation.
- Chemical Processing Industries.
- Oil and Gas Industries.
- Pulp and Paper plants.