

Training Title

CORROSION OF IRON & STEEL STRUCTURES

Training Duration

5 days

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

Training Venue and Dates

Corrosion of Iron & Steel Structures	5	02-06 May	\$3,300	Dubai
Corrosion of Iron & Steel Structures	5	03-07 October	\$3,300	Dubai

Training will be held at any 5 Star Hotels. Exact venue will be informed later

Training Fees

- 3300\$ per participant for Public Training including Course Materials/Handouts, Tea/Coffee, Refreshments & International Buffet Lunch
- Training will be held at any 5 Star Hotels

TRAINING OVERVIEW

INTRODUCTION & DESCRIPTION

The annual losses due to corrosion and the cost of rectification runs to several billion dollars in most of the countries. High production under aggressive and extreme operational conditions necessitates the development of new materials which also have peculiar failure patterns. Thus mankind is on continuous experimentation with products and processes. Yet material failure not only entails in loss of production but loss of life as well. Prediction of failure pattern, residual life measurements, preventive measures are all approaches in corrosion studies for safe and economic operation of plant and machinery

COURSE OBJECTIVES

This course aims to provide the participants with an understanding of why and how corrosion occurs, and how the environment in the oil fields is aggressive to iron and steel

equipment, plant and structures. It is designed to give a practical approach to control corrosion, and prevent failures. Presented are the basic concepts of corrosion, the metallurgy of iron and steel, and the mechanism of failure, Participants learn the state of art of corrosion control and be able to apply it in day-to-day work, thereby ensuring safety, plant reliability and economy. It is an update of Corrosion problems that affect the oil and gas production and reduce the plant integrity. It necessitates an understanding that aging plants can cause catastrophic failures and underlines the importance and methodology of inspection. This also imparts an awareness of the emerging technologies for corrosion control and failure prevention. Photographs of plant failures and failure analysis, reinforce the understanding of the theory taught.

Training Methodology

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. All lectures are in colourful PowerPoint presentation. Student will receive a Manual or work book. Some practical and Demo will be made on the last day
A video on corrosion will be shown.

WHO SHOULD ATTEND

For all Maintenance staff who are interested in knowing why some components fail more often than expected- A Corrosion awareness- For Plant Engineers who are interested in learning the fitness for service of plant and equipment- For Safety Engineers who are interested in health safety and environment in case of unintended plant failure-for Finance Managers who are interested in MRO and plant maintenance cost and for all those who want to know about inspection and monitoring.

COURSE OUTLINE

Day 1 **Basic Metallurgy of Iron and steel**

- History and the development of iron & steel
- Physical metallurgy of carbon steel

- The mechanical metallurgy of steel
- Chemical properties of carbon steel
- Defects in metals
 - Point defects
 - Line defects
 - Volume defects

Day 2 **Corrosion Basics**

- Definition of corrosion
- The social impact of corrosion
- Evolution of the corrosion theory
- Measurement of corrosion
- Mechanism of Corrosion
- High temperature oxidation

Day 3. **Preventive control by design**

- Innovative Vs iterative Design
- Material selection Vs environment
 - Galvanic effect
 - Flow and velocity effects
 - Temperature and creep effect
 - Stress
 - Fabricational issues

Day 3 **Coating painting and lining**

- Deft definition
- Classification and types
 - For atmospheric
 - Buried
 - Submerged

- Internal

- Surface preparation & application
- Coating defects and causes
- Insulation & Lining materials
- Under cladding issues

Chemicals for fouling & corrosion control

- Selection for
 - Production & recovery
 - Pipeline & tanks
 - Cooling water
 - Acid systems
 - Boiler water
- Dosing methods
- Economics and control

Day 4 Cathodic Protection

- Principles of CP
- Galvanic and Impressed systems
- Selection of material and design
- Pitfalls and failure
- Monitoring and control

Day 5 Internal Corrosion

- By Direct Assessment
 - Sampling of line for
 - Dissolved H₂S
 - Dissolved CO₂
 - PH
 - Bacteria

- By Internal line Inspection

- Maintenance plan for pigging of line
 - Various types of pigs
 - Data acquisition and study
 - Cost and limitations
- Each lecture has practical. A Manual for Practical with Sketch will be Provided

Welding and joining- out door Ferrous and non ferrous & some NDT methods of inspection

Cathodic protection- The experiments will be in plastic tubs and hands on

NOTE:

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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