

**Training Title**

**CORROSION AND FOULING MANAGEMENT**

**Training Duration**

5 days

**Training Dates & Venue**

REF WC02 1	Corrosion and Fouling Management	5	04 – 08 Feb	\$4,250	Dubai, UAE
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Training will be held at any of the 5 star hotels. The exact venue will be informed once finalized.

**Training Fees**

- 4,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

Corrosion and fouling problems occur in the petroleum refinery in various processes and operations. The magnitude of a petroleum refinery unit and the complex of the processes are such that a wide variety of equipment types can be subject to corrosion and fouling depending on the process. Some refinery equipment types are more vulnerable to corrosion and fouling, than others usually due to their role in the process. Uncontrolled corrosion in petroleum refineries can cause release of hazardous substances and components or can reduce both the performance and reliability of equipment until their failure. As such, corrosion hazards can put at risk the safety and well-being of plant employees and the general public as well as lead to severe damage of process units, and in some cases shutdown of refinery operations.

In petroleum refineries, many processes are subject to problems with heavy fouling that affect overall plant performance and profitability. Operating costs associated with fouling in refinery heat exchangers typically include increased fuel needs, increased pumping power, and reduced throughput and capacity of produced products. Estimates have been made of fouling costs, due primarily to wasted energy caused by excessive fuel use, that are as high as 0.25% of the gross national product of the industrialized countries.

**TRAINING OBJECTIVES**

- Identify common refinery corrosion and fouling problems, including where they typically occur.
- Describe the type of corrosion or fouling that is present based on location, process conditions, and symptoms

- Identify control strategies for common corrosion and fouling problems, including their benefits and liabilities
- Use problem-solving techniques to resolve corrosion problems

Apply knowledge of corrosion and fouling management to solve less common problems.

### WHO SHOULD ATTEND?

Refinery engineers, technologists, operators, inspectors, corrosion professionals and chemists

### 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 presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

### TOPICS COVERED

Introduction to corrosion, Low temperature corrosion mechanisms, High temperature corrosion mechanisms, Fouling overview, specific fouling problems, Refinery chemicals – corrosion inhibitors and antifoulants, Corrosion monitoring and prevention, Problem solving and case studies. Unit specific corrosion information – Desalter, Crude Unit, Vacuum Unit, Fcc, Amine Unit, Reformer, Hydrotreater, Hydrocracker, Penex Unit, Sour water stripper, Vis Breaker, Low Pressure Coking, Merox Unit, Sulfolane Unit, and HF Alkylation.

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### COURSE OUTLINE

#### Day One

- 1-Significance of corrosion & fouling petroleum refining industry
- 2-Refinery feedstock
- 3-Refinery products
- 4-Refinery processes
- 5-Refinery equipment
- 6-Metallurgy of refinery specific process equipment

#### Day Two

- 7-Introduction to corrosion fundamentals

- 8-Forms of corrosion
- 9-Corrosion of refinery specific equipment
- 10-Damage mechanisms
- 11-Group discussion-Applicable API 579 standard for damage mechanisms

**Day Three**

- 12-Introduction to fouling
- 13-Types of fouling
- 14-Fouling influencing factors
- 15-Fouling diagnosis
- 16-Refinery specific process unit fouling problems
- 17-Case Study-Refinery fouling problem

**Day Four**

- 18-Refinery corrosion inhibitors injection in specific process units
- 19-Refinery corrosion monitoring in specific process units
- 20-Group discussion-Applicable NACE standards for weight loss coupons
- 21-Case study-Refinery corrosion monitoring

**Day Five**

- 22-Refinery fouling detection and monitoring in specific process units
- 23-Refinery fouling mitigation control and removal in specific process units
- 24-Fouling control by chemical treatment (antifoulants)
  - 25-Mechanical methods for fouling removal
- 26-Chemical cleaning
- 27-Environmental and safety impact

**TRAINING OUTCOME**

By end of the course, participants should become able to:

- ✓ Identify common refinery corrosion and fouling problems, including where they typically occur.
- ✓ Describe the type of corrosion or fouling that is present based on location, process conditions, and symptoms
- ✓ Identify control strategies for common corrosion and fouling problems, including their benefits and liabilities
- ✓ Use problem-solving techniques to resolve corrosion problems
- ✓ Apply knowledge of corrosion and fouling management to solve less common problems.

**NOTE:**

Pre & Post Tests will be conducted

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

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