# COURSE OVERVIEW FE0068
# Corrosion Control in Refinery

**Course Title**
Corrosion Control in Refinery

**Course Date/Venue**
Please see page 3

**Course Reference**
FE0068

**Course Duration/Credits**
Five days/3.0 CEUs/30 PDHs


**Course Description**

***This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.***

This course is designed to provide participants with a detailed and up-to-date overview on the Corrosion Control in Refinery. It covers the importance of corrosion and its impact on refinery operations; the various forms of corrosion and mechanisms behind each; the fundamentals of electrochemical processes that lead to corrosion; the energy aspects and rate processes in corrosion; the different corrosive environments specific to refinery operations; the specific pathways and reactions involved in common types of corrosion; the material selection strategies to minimize corrosion; the role of different alloys in resisting corrosion; and the impact of impurities on corrosion and the design considerations to prevent corrosion.

During this interactive course, participants will learn the techniques to alter the environment to reduce corrosion; the types of coatings and their application methods for corrosion protection; the cathodic and anodic protection methods; the use of chemical inhibitors to control corrosion; the corrosion monitoring systems; the non-destructive testing (NDT) methods and electrochemical monitoring techniques; the water chemistry and its role in corrosion; the analysis of deposits and scales; the corrosion rate calculation and corrosion in specific refinery units; the emerging technologies and materials in corrosion; the regulatory and safety aspects and economic impact of corrosion management; and the steps to develop a corrosion management plan.

**Course Objectives**

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain systematic techniques on corrosion control in refinery
- Identify the various forms of corrosion and the specific mechanisms that result in each form
- Discuss the electrochemical processes and concepts
- Recognize the different types of corrosive environments that affect corrosion
- Control corrosion by selection of design and engineering materials, modification of environment, cathodic and anodic protection and protective coatings
- Monitor corrosion using testing, inspection, specimen exposure, electrochemical methods, water chemistry and analysis of deposits
- Discuss the importance of corrosion and its impact on refinery operations
- Identify the various forms of corrosion and mechanisms behind each as well as the fundamentals of electrochemical processes that lead to corrosion
- Carryout the energy aspects and rate processes in corrosion
- Recognize different corrosive environments specific to refinery operations and explore the specific pathways and reactions involved in common types of corrosion
- Select the right materials to minimize corrosion and discuss the role of different alloys in resisting corrosion
- Discuss the impact of impurities on corrosion and modify design to prevent mitigate corrosion risks
- Employ proper techniques to alter the environment to reduce corrosion and identify the types of coatings and their application methods for corrosion protection
- Explore cathodic and anodic protection methods and use chemical inhibitors to control corrosion
- Discuss emerging technologies and systems used for monitoring corrosion
- Carryout non-destructive testing (NDT) methods and electrochemical monitoring techniques
- Analyze how water chemistry influences corrosion processes as well as deposits and scales and their role in corrosion
- Calculate corrosion rates from various data points and explain corrosion control strategies in specific refinery units
- Discuss emerging technologies and materials in corrosion control
- Review the compliance with international standards and safety regulations
- Determine economic impact of corrosion management and develop a corrosion management plan

## Exclusive Smart Training Kit - H-STK®


*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

## Who Should Attend

This course provides an overview of an overview of all significant aspects and considerations of corrosion control in the refinery for corrosion engineers, technicians, managers, environmental and safety professionals, researchers, scientists, quality control, assurance personnel and consultants.

## Course Date/Venue

| Session(s) | Date | Venue |
|---|---|---|
| 1 | February 01-05, 2026 | Safir Meeting Room, Divan Istanbul, Taksim, Turkey |
| 2 | June 21-25, 2026 | Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE |
| 3 | September 20-24, 2026 | Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA |
| 4 | December 07-11, 2026 | Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE |

## Course Fee

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|---|---|
| Istanbul | **US$ 6,000** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day. |
| Dubai/Al Khobar/Abu Dhabi | **US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day. |

## Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

## Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

## Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

## Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

**Course Instructor(s)**

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

**Mr. George Poulos**, MBA, MSc, BSc, CEng, is a **Senior Corrosion & Metallurgical Engineer** with over **30 years** of extensive experience within the **Oil & Gas, Petrochemical, Refinery, Construction, Aircraft & Shipbuilding** Industry. His wide experiences cover in the areas of **Metallurgical** Failure Analysis & Prevention, **Corrosion** Control, **Corrosion** Fabrication & Inspection, **Fabrication** & **Repair**, **Corrosion** Prevention, **Corrosion** Engineering, **Corrosion Control**, **Corrosion Inhibition**, **Corrosion** Management in Process Operations, **Corrosion** & Prevention of Failures, **Material** Selection, **Cathodic Protection** Systems, **Steel Metallurgy**, **Steel** Structure Welding, **Steelmaking** Slag, **Steel** Making Application, **Steel Making** Process, **Steel** Manufacturing, **Steel Forging**, **Steel** Manufacturing & Process Troubleshooting, **Hot Rolling** Process, **Hot Strip Mill**, **Mill** Operations, **Roll Mill**, **Electric Arc Furnace** (**EAF**), **Slit Rolling**, **Carbon Steel Pipe** Wall Thickness & Grade Selection, **Ferro-Alloys**, **Heat Treatment** & **Prevention Techniques** and **Post Weld Heat Treatment**. Further, he is also well-versed in **Welding** Inspection, **Welding** & **Machine** Techniques, **TIG** & **Arc Welding**, **Shielded Metal Arc Welding**, **Gas Tungsten** & **Gas Metal Arc Welding**, **Welding** Procedure Specifications & Qualifications, **Aluminium Welding**, **Hot Work-Safety**, **SMAW**, **GTAW**, **Welding** Techniques, **Pipeline Welding** Practices, **Welding** Engineering, **Welding** Fatigue & Fracture Mechanics, **Welding Inspection Technology**, **Welding Safety**, **Welding** Defects Analysis, **Welding Technology**, **Welding Problems**, **Welding & Non Destructive** Testing and **Metallurgy Techniques**.

During his career life, Mr. Poulos has gained his practical and field experience through his various significant positions and dedication as the **Chief Executive**, **Head of Technical Studies**, **Manager**, **Senior Consultant**, **Lead Welding Engineer**, **Senior Welding Engineer**, **Design Engineer**, **Sales Engineer**, **Author**, **Welding Instructor**, **Visiting Lecturer** and **Technical Proposal Research Evaluator** from various international companies such as Greek Welding Institute, Hellenic Quality Forum and International Construction Companies such as Shipbuilding, Aircraft Industry and Oil and Gas Industry.

Mr. Poulos is a **Registered Chartered Engineer** and has a **Master's** degree in **Naval Architecture**, a **Bachelor's** degree in **Welding Engineering** and a Master of Business Administration (**MBA**) from the **Sunderland University**, **Aston University** and **Open University**, **UK**, respectively. Further, he is a **Certified Trainer/Instructor**, an active Member of Chartered Quality Institute (**CQI**), The British Welding Institute (**TWI**), The Royal Institution of Naval Architects (**RINA**) and American Welding Society (**AWS**), a Registered **EWF/IW** (European Welding Federation-International Welding Institute W/E) and an **IRCA** Accredited External Quality Systems Auditor through BVQI. He is an **Author** of Technical Book dealing with Protection/Health/Safety in the Welding/Cutting domain and delivered various trainings, seminars, conferences, workshops and courses globally.

## Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

***Day 1***

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|---|---|
| *0730 – 0800* | *Registration & Coffee* |
| *0800 – 0815* | *Welcome & Introduction* |
| *0815 – 0830* | ***PRE-TEST*** |
| *0830 – 0930* | ***Introduction to Corrosion in Refineries:*** *Definition, Importance & Impact on Refinery Operations* |
| *0930 – 0945* | *Break* |
| *0945 - 1030* | ***Types of Corrosion:*** *Identifying Various Forms of Corrosion (Uniform, Pitting, Galvanic, Crevice, etc.) & The Mechanisms Behind Each* |
| *1030 - 1130* | ***Fundamentals of Electrochemistry:*** *Introduction to Electrochemical Processes that Lead to Corrosion* |
| *1130 - 1230* | ***Corrosion Thermodynamics & Kinetics:*** *Understanding the Energy Aspects & Rate Processes in Corrosion* |
| *1230 - 1245* | *Break* |
| *1245 - 1330* | ***Corrosive Environments in Refineries:*** *Recognizing Different Corrosive Environments Specific to Refinery Operations* |
| *1330 - 1420* | ***Case Studies:*** *Analysis of Real-World Corrosion Incidents in Refineries* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day One* |

***Day 2***

| | |
|---|---|
| *0730 – 0830* | ***Detailed Mechanisms of Corrosion:*** *Exploring the Specific Pathways & Reactions Involved in Common Types of Corrosion* |
| *0830 - 0930* | ***Material Selection Strategies:*** *How to Choose the Right Materials to Minimize Corrosion* |
| *0930 – 0945* | *Break* |
| *0945 – 1100* | ***Alloy Composition & Corrosion Resistance:*** *Discussing the Role of Different Alloys in Resisting Corrosion* |
| *1100 – 1230* | ***Impact of Impurities on Corrosion:*** *How Impurities in Materials can Exacerbate Corrosion Processes* |
| *1230 – 1245* | *Break* |
| *1245 – 1350* | ***Design Considerations to Prevent Corrosion:*** *Modifying Design to Mitigate Corrosion Risks* |
| *1350 - 1420* | ***Group Activity:*** *Selecting Materials for Different Refinery Components Based on their Environment & Expected Life* |
| *1420 – 1430* | ***Recap*** |
| *1430* | *Lunch & End of Day Two* |

***Day 3***

| | |
|---|---|
| *0730 – 0830* | ***Modification of Environment:*** *Techniques to Alter the Environment to Reduce Corrosion* |
| *0830 - 0930* | ***Protective Coatings:*** *Types of Coatings & their Application Methods for Corrosion Protection* |
| *0930 – 0945* | *Break* |

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|---|---|
| 0945 – 1100 | ***Cathodic & Anodic Protection:*** *Detailed Exploration of these Electrochemical Protection Methods* |
| 1100 – 1230 | ***Use of Inhibitors:*** *How Chemical Inhibitors are Selected & Applied to Control Corrosion* |
| 1230 – 1245 | *Break* |
| 1245 – 1350 | ***Corrosion Monitoring Systems:*** *Introduction to Technologies & Systems Used for Monitoring Corrosion* |
| 1350 - 1420 | ***Workshop:*** *Applying Protective Methods on Simulated Refinery Equipment* |
| 1420 – 1430 | ***Recap*** |
| 1430 | *Lunch & End of Day Three* |

***Day 4***

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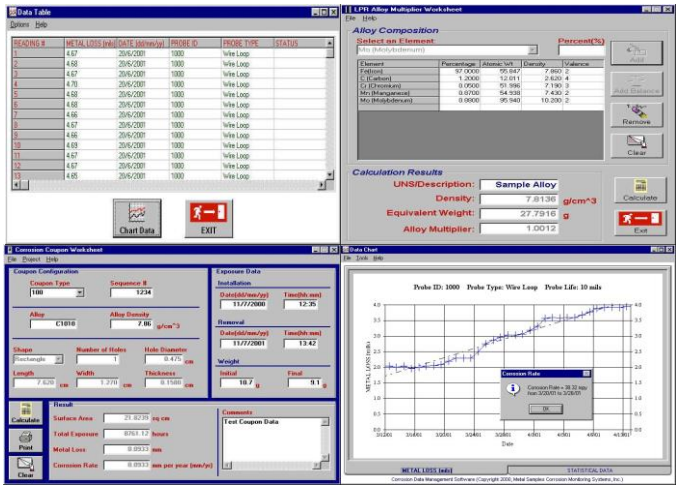
|---|---|
| 0730 – 0830 | ***Non-Destructive Testing (NDT) Methods:*** *Overview of Techniques such as Ultrasonic, Radiographic & Magnetic Testing* |
| 0830 - 0930 | ***Electrochemical Monitoring Techniques****: Detailing Methods Like Linear Polarization Resistance (LPR) & Electrochemical Impedance Spectroscopy (EIS)* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Water Chemistry & its Role in Corrosion:*** *Analyzing How Water Chemistry Influences Corrosion Processes* |
| 1100 – 1230 | ***Analysis of Deposits & Scales:*** *Methods for Analyzing Deposits & their Role in Corrosion* |
| 1230 – 1245 | *Break* |
| 1245 – 1350 | ***Corrosion Rate Calculation:*** *Techniques to Estimate Corrosion Rates from Various Data Points* |
| 1350 - 1420 | ***Practical Session:*** *Use of NDT & Electrochemical Methods on Test Specimens* |
| 1420 – 1430 | ***Recap*** |
| 1430 | *Lunch & End of Day Four* |

***Day 5***

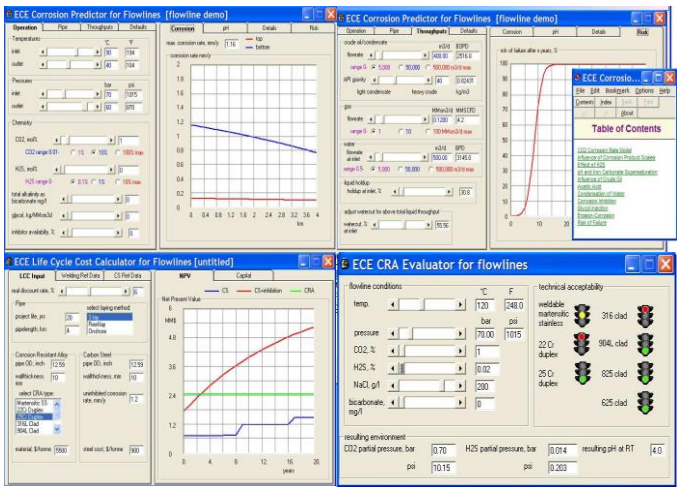
| | |
|---|---|
| 0730 – 0830 | ***Corrosion in Specific Refinery Units:*** *Tailored Corrosion Control Strategies for Units Like FCC, Cokers & Hydrotreaters* |
| 0830 - 0930 | ***New Advances in Corrosion Protection Technologies:*** *Emerging Technologies & Materials in Corrosion Control* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Regulatory & Safety Aspects:*** *Understanding Compliance with International Standards & Safety Regulations* |
| 1100 – 1230 | ***Economic Impact of Corrosion Management:*** *Cost-Benefit Analysis of Effective Corrosion Management Strategies* |
| 1230 – 1245 | *Break* |
| 1245 – 1330 | ***Developing a Corrosion Management Plan:*** *Steps to Create a Comprehensive Plan for a Refinery* |
| 1330- 1345 | ***Roundtable Discussion:*** *Future Challenges in Corrosion Control & Potential Solutions* |
| 1345 - 1400 | ***Course Conclusion*** |
| 1400 – 1415 | ***POST-TEST*** |
| 1415 – 1430 | *Presentation of Course Certificates* |
| 1430 | *Lunch & End of Course* |

## Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulators "Corrosion Data Management Software (CDMS)" and "Electronic Corrosion Engineer (ECE®) 5".




**Corrosion Data Management Software (CDMS)**




**Electronic Corrosion Engineer (ECE®) 5**

## Course Coordinator

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