# COURSE OVERVIEW FE1014
# Corrosion Specialist
# Corrosion Monitoring & Inhibition Techniques

**Course Title**
Corrosion Specialist: Corrosion Monitoring & Inhibition Techniques


**Course Date/Venue**
September 07-11, 2025/ The Victoria Meeting Room, The H Hotel, Sheikh Zayed Road Trade Centre, Dubai, UAE



**Course Reference**
FE1014

**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 of Corrosion Specialist: Corrosion Monitoring and Inhibition Techniques. It covers the corrosion principles and corrosion mechanisms and types; the material behavior and corrosive environment; the factors affecting corrosion rate and corrosion of metals and alloys; the corrosion damage assessment, failure analysis and visual inspection techniques; the weight loss coupons and electrical resistance (ER) probes; the linear polarization resistance (LPR) monitoring, ultrasonic thickness measurement and corrosion mapping techniques; the principles of corrosion inhibition and film-forming inhibitors; and the vapor phase inhibitors (VPI) and cathodic inhibitors.

During this interactive course, participants will learn the inhibitor testing and evaluation, laboratory test methods, performance criteria and environmental considerations; the safe handling and storage of inhibitor, chemical handling standards, PPE requirements, storage conditions and spill response; the cathodic protection (CP), galvanic (sacrificial) anode systems and impressed current CP systems; the CP monitoring and maintenance, CP applications in industry and integration of CP with corrosion monitoring; the corrosion risk assessment (CRA), corrosion management strategies, monitoring program design and integrity management systems (IMS); the emerging technologies in corrosion control; and the remote monitoring systems, smart sensors and IoT applications and predictive analytics.

## Course Objectives

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

- Get certified as a *"Certified Corrosion Specialist"*
- Discuss corrosion principles and corrosion mechanisms and types
- Explain material behavior and corrosive environment, factors affect corrosion rate and corrosion of metals and alloys
- Perform corrosion damage assessment, failure analysis and visual inspection techniques
- Recognize weight loss coupons and electrical resistance (ER) probes
- Apply linear polarization resistance (LPR) monitoring, ultrasonic thickness measurement and corrosion mapping techniques
- Discuss the principles of corrosion inhibition, film-forming inhibitors, vapor phase inhibitors (VPI) and cathodic inhibitors
- Carryout inhibitor testing and evaluation covering laboratory test methods, performance criteria and environmental considerations
- Implement safe handling and storage of inhibitor including chemical handling standards, PPE requirements, storage conditions and spill response
- Recognize cathodic protection (CP), galvanic (sacrificial) anode systems and impressed current CP systems
- Employ CP monitoring and maintenance, CP applications in industry and integration of CP with corrosion monitoring
- Apply corrosion risk assessment (CRA), corrosion management strategies, monitoring program design and integrity management systems (IMS)
- Discuss the emerging technologies in corrosion control comprising of remote monitoring systems, smart sensors and IoT applications and predictive analytics

## 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 all significant aspects and considerations of corrosion monitoring and inhibition techniques for corrosion engineers and specialists, integrity and inspection engineers, chemical and process engineers, maintenance and reliability engineers, materials and metallurgy engineers and other technical staff. who are involved in corrosion monitoring systems and chemical inhibition techniques.

## Course Fee

**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.

## Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Successful candidate will be certified as a *"Certified Corrosion Specialist"*. Certificates are valid for 5 years.

**Recertification is FOC for a Lifetime.**

## Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-



(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

**CEU Official Transcript of Records**

**TOR Issuance Date:** 14-Nov-24

**HTME No.** 74851

**Participant Name:** Waleed Al Habeeb

| Program Ref. | Program Title | Program Date | No. of Contact Hours | CEU's |
|---|---|---|---|---|
| FE1014 | Corrosion Specialist<br>Corrosion Monitoring & Inhibition Techniques | Nov 10-14, 2024 | 30 | 3.0 |

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Jaryl Castillo
Academic Director

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

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

## 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. Greg Combrink**, MSc, BSc, is a **Senior Corrosion Engineer** with over **30 years** of industrial experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery**, **Utilities** and **Power** industries. His wide expertise widely covers in the areas of **Corrosion** Control & Monitoring, **Corrosion Inhibition**, **Inhibitor Effectiveness** Calculation, **Metallurgy**, **Corrosion Failure Investigation**, Environmental Testing for **Corrosivity Classification**, **Stress Corrosion Cracking** Investigations & Testing, **Corrosion** Testing & Evaluation, **Corrosion** Mitigation, **Corrosion & Cathodic** Protection Survey, **Corrosion & Material** Testing, **Corrosion Cracking** Investigations & Testing, **Corrosion** Prevention & Risk, **Cathodic Protection** Systems Design & Implementation, **Coating** Technology & Applications, **Coating** Inspection & Corrosion Mechanism, **Coating** Application & Quality Control, **Metal Casting** Technology, **Material Sustainability** Testing, **Material Selection** Testing, **Electrochemical & Exposure** Testing, Contamination Control of Lubricants/Fuels & Process Fluids, **Tribology & Lubrication**, Rust Removal, **NDT** Testing, Underground Minerals Corrosivity, Conventional & Air Spray Coating, Stainless Steel **Welded Tanks**, **Heat & Mass Transfer**, **Metal** Analysis and Friction Testing & Non-Skid Surfaces.

During his career life, Mr. Combrink has gained his practical and field experience through his various significant positions and dedication as the **CEO/Technical Director**, **Corrosion Engineering Director**, **Corrosion Engineer**, **Officer-in-Charge & General Manager**, **Technical Manager**, **Programme Manager**, **Corrosion Projects Manager**, **Corrosion Specialist**, **Metalworking Product Applications Engineer**, **Manager/Officer-In-Charge Materials Lab**, **Sub-Lieutenant**, **Senior Instructor/Trainer** and **Reactor Technician** for various companies such as the Corrosion Hub, Total Contamination Control SA (Pty) Ltd, Bora Corrosion Solutions, Solar Even Pty Ltd, University of Johannesburg, University of Witwatersrand, Castrol South Africa, Sa Navy, SA Police, Geyser Enode and Metal Casting Technology Station.

Mr. Combrink has a **Master's** degree in **Corrosion Science & Engineering** from the **University** of **Manchester Institute** of **Science** and **Technology** (**UMIST**), **UK** and a **Bachelor's** degree in **Chemical Engineering**. Further, he is an **Accredited Assessor & Moderator** from the South African Qualifications Authority (**SAQA**) and an **Accredited Assessor & Committee Member** (**Corrosion Protection**) from the South African Qualification & Certification Committee (**SAQCC**). He is also a **Fellow** from the Corrosion Institute Ghana (**CorrIGh**), an **Executive Committee Member/Former President** from the Corrosion Institute of Southern Africa (**CorrISA**) and a **Member** of the Southern African Institute of Tribology (**SAIT**) and has further delivered numerous trainings, courses, seminars, conferences and workshops globally.

## 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 Program

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

***Day 1:*** ***Sunday, 07th of September 2025***

| | |
|---|---|
| *0730 – 0800* | *Registration & Coffee* |
| *0800 – 0815* | *Welcome & Introduction* |
| *0815 – 0830* | ***PRE-TEST*** |
| *0830 – 0930* | ***Introduction to Corrosion Principles***<br>*Understanding Electrochemical Nature of Corrosion • Types of Corrosion Reactions • Thermodynamics of Corrosion • Kinetics of Corrosion Processes* |
| *0930 – 0945* | *Break* |
| *0945 – 1030* | ***Corrosion Mechanisms & Types***<br>*Uniform Corrosion • Pitting Corrosion • Crevice Corrosion • Galvanic Corrosion* |
| *1030 – 1130* | ***Material Behavior & Corrosive Environments***<br>*Corrosion in Aqueous Environments • Corrosion in Atmospheric Conditions • Corrosion in Soil Environments • Corrosion in Industrial Environments* |
| *1130 – 1215* | ***Factors Affecting Corrosion Rate***<br>*Temperature Influence • pH Effects • Oxygen Availability • Flow Conditions* |
| *1215 – 1230* | *Break* |
| *1230 – 1330* | ***Corrosion of Metals & Alloys***<br>*Behavior of Carbon Steels • Stainless Steel Corrosion • Aluminum & Copper Alloys Corrosion • Nickel-Based Alloys Corrosion* |
| *1330 – 1420* | ***Corrosion Damage Assessment & Failure Analysis***<br>*Identifying Corrosion Damage • Failure Analysis Methodology • Case Studies of Failures • Importance of Documentation* |
| *1420 – 1430* | ***Recap***<br>*Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow* |
| *1430* | *Lunch & End of Day One* |

**Day 2: Monday, 08th of September 2025**

| | |
|---|---|
| 0730 – 0830 | ***Visual Inspection Techniques***<br>*Principles of Inspection • Tools for Visual Examination • Documentation Practices • Limitations of Visual Inspection* |
| 0830 – 0930 | ***Weight Loss Coupons***<br>*Coupon Preparation • Deployment Strategies • Data Interpretation • Advantages & Disadvantages* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Electrical Resistance (ER) Probes***<br>*Working Principle • Installation & Use • Data Analysis • Applications in Pipelines* |
| 1100 – 1215 | ***Linear Polarization Resistance (LPR) Monitoring***<br>*Electrochemical Theory • Field Applications • Data Interpretation • Limitations* |
| 1215 – 1230 | *Break* |
| 1230 – 1330 | ***Ultrasonic Thickness Measurement***<br>*UT Principles • Selection of Test Locations • Interpretation of Thickness Data • Advanced UT Applications* |
| 1330 – 1420 | ***Corrosion Mapping Techniques***<br>*Grid-Based Mapping • API 570 Guidance • Data Visualization • Integration into Maintenance Plans* |
| 1420 – 1430 | ***Recap***<br>*Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow* |
| 1430 | *Lunch & End of Day Two* |

**Day 3: Tuesday, 09th of September 2025**

| | |
|---|---|
| 0730 – 0830 | ***Principles of Corrosion Inhibition***<br>*Inhibitor Definition & Role • Types of Inhibitors • Inhibitor Selection Criteria • Inhibitor Application Methods* |
| 0830 – 0930 | ***Film-Forming Inhibitors***<br>*Mechanism of Protection • Common Chemicals Used • Application Challenges • Case Studies* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Vapor Phase Inhibitors (VPI)***<br>*Principle of Action • Suitable Environments • Packaging & Deployment • Effectiveness Monitoring* |
| 1100 – 1215 | ***Cathodic Inhibitors***<br>*Polarization Mechanisms • Application for Acid Environments • Synergy with Other Inhibitors • Monitoring Effectiveness* |
| 1215 – 1230 | *Break* |
| 1230 – 1330 | ***Inhibitor Testing & Evaluation***<br>*Laboratory Test Methods • Field Trial Approaches • Performance Criteria • Environmental Considerations* |
| 1330 – 1420 | ***Safe Handling & Storage of Inhibitors***<br>*Chemical Handling Standards • PPE Requirements • Storage Conditions • Spill Response* |
| 1420 – 1430 | ***Recap***<br>*Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow* |
| 1430 | *Lunch & End of Day Three* |

| Day 4: | Wednesday, 10th of September 2025 |
|---|---|
| 0730 – 0830 | ***Principles of Cathodic Protection (CP)***<br>*Galvanic Anode Basics • Impressed Current CP Systems • CP Design Considerations • CP Limitations* |
| 0830 – 0930 | ***Galvanic (Sacrificial) Anode Systems***<br>*Anode Material Selection • Design Life Estimation • Installation Guidelines • Monitoring Requirements* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***Impressed Current CP Systems***<br>*Rectifier Operation • Anode Bed Configurations • Current Distribution • Maintenance Practices* |
| 1100 – 1215 | ***CP Monitoring & Maintenance***<br>*Potential Measurement Techniques • Current Measurement • Criteria for Protection • Troubleshooting CP Systems* |
| 1215 – 1230 | *Break* |
| 1230 – 1330 | ***CP Applications in Industry***<br>*Pipelines Protection • Storage Tanks Protection • Offshore Structures Protection • Case Studies & Best Practices* |
| 1330 – 1420 | ***Integration of CP with Corrosion Monitoring***<br>*Data Correlation Strategies • Use of Coupons & Probes in CP Systems • Assessment Intervals • Reporting Requirements* |
| 1420 – 1430 | ***Recap***<br>*Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow* |
| 1430 | *Lunch & End of Day Four* |

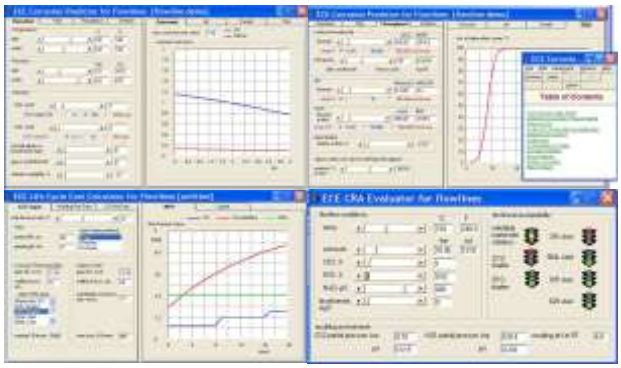
| Day 5: | Thursday, 11th of September 2025 |
|---|---|
| 0730 – 0830 | ***Corrosion Risk Assessment (CRA)***<br>*Definition & Purpose • CRA Methodology • Risk Ranking Matrices • Integration with Asset Integrity* |
| 0830 – 0930 | ***Corrosion Management Strategies***<br>*Corrosion Management Plans (CMP) • Inspection & Monitoring Integration • Data Management Systems • KPIs & Performance Indicators* |
| 0930 – 0945 | *Break* |
| 0945 – 1030 | ***Monitoring Program Design***<br>*Program Objectives • Selection of Monitoring Techniques • Optimization of Inspection Intervals • Continuous Improvement Practices* |
| 1030 – 1130 | ***Integrity Management Systems (IMS)***<br>*Standards & Frameworks • Corrosion Management in IMS • Reporting & Documentation • Auditing & Reviews* |
| 1130 – 1230 | ***Case Studies & Industry Best Practices***<br>*Upstream Oil & Gas Examples • Refinery Corrosion Management • Power Generation Industry • Water Treatment Facilities* |
| 1230 – 1245 | *Break* |

| | |
|---|---|
| *1245 – 1345* | ***Emerging Technologies in Corrosion Control***<br>*Remote Monitoring Systems • Smart Sensors & IoT Applications • Predictive Analytics • Digital Twins for Corrosion Management* |
| *1345 – 1400* | ***Course Conclusion***<br>*Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course* |
| *1400 – 1415* | ***COMPETENCY EXAM*** |
| *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**

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org