COURSE OVERVIEW PE0293
Oil Stabilization and Sweetening for Operator

Course Title
Oil Stabilization and Sweetening for Operator

Course Date/Venue
Session 1: June 29-July 03, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: November 24-28, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
PE0293

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

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Gas Sweetening Process at Upstream Oil and Gas (Amine System, Dehydration System, Demin System). It covers the gas sweetening in upstream oil and gas; the impact of wellhead chemicals and upstream machine oil entrainment on amine process; the role of gas treatment in meeting product specifications, environmental standards and storage; the properties and behavior of CO_2, H_2S, and other sour gases in natural gas streams; the types of amines used (MEA, DEA, MDEA, DGA and specialty formulated amines (sulfinol, solexol) including the selection criteria and their specific applications; the filtration, reclaimer and packed columns; the amine system components and design covering amine separator (effective inlet separation for gas sweetening process), contactor, regenerator, heat exchangers, pumps and strippers; the operational parameters, flow rates, temperature controls and amine concentration management; and the maintenance and safety practices.

Further, the course will also discuss the fundamentals of gas dehydration including TEG, molecular sieves and the importance of water removal from natural gas; designing and operating the TEG dehydration units including glycol contactor, regenerator and pumps; the molecular sieves in gas dehydration including design considerations, operation and regeneration processes; the demineralization in gas processing and the impacts on system efficiency and corrosion prevention; and the components and operational aspects of demineralization systems including ion exchange processes and membrane technologies.

During this interactive course, participants will learn the advanced process integration, process simulation and optimization techniques; the common operational problems covering amine foaming, antifoam options and selection, corrosion, amine losses, gas slippage, amine degradation and viscosity changes; diagnosing and addressing issues in dehydration and demineralization systems like glycol degradation and ion exchange resin fouling; and the best practices for achieving operational efficiency, reducing operating costs and optimizing the lifecycle of gas sweetening facilities.

Course Objectives

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

- Apply and gain an in-depth knowledge on gas sweetening process at upstream oil and gas (amine system, dehydration system, demin system)
- Discuss the gas sweetening in upstream oil and gas, the impact of wellhead chemicals and upstream machine oil entrainment on amine process as well as the role of gas treatment in meeting product specifications, environmental standards and storage
- Identify the properties and behavior of CO_2, H_2S, and other sour gases in natural gas streams
- Recognize the types of amines used (MEA, DEA, MDEA, DGA and specialty formulated amines (sulfinol, solexol) including the selection criteria and their specific applications as well as filtration, reclaimer and packed columns
- Discuss the amine system components and design covering amine separator (effective inlet separation for gas sweetening process), contactor, regenerator, heat exchangers, pumps and strippers
- Employ operational parameters, flow rates, temperature controls and amine concentration management as well as the maintenance and safety practices
- Identify the fundamentals of gas dehydration including TEG, molecular sieves and the importance of water removal from natural gas
- Design and operate TEG dehydration units including glycol contactor, regenerator and pumps
- Explain the molecular sieves in gas dehydration including design considerations, operation and regeneration processes
- Illustrate demineralization in gas processing and discuss the impacts on system efficiency and corrosion prevention
- Recognize the components and operational aspects of demineralization systems including ion exchange processes and membrane technologies
- Implement advanced process integration and carryout process simulation and optimization techniques
- Identify the common operational problems covering amine foaming, antifoam options and selection, corrosion, amine losses, gas slippage, amine degradation and viscosity changes
- Diagnose and address issues in dehydration and demineralization systems like glycol degradation and ion exchange resin fouling
- Implement best practices for achieving operational efficiency, reducing operating costs and optimizing the lifecycle of gas sweetening facilities

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 advanced overview on the principles, risks and financials of gas sweetening process at upstream oil and gas (amine system, dehydration system, demin system) for mechanical engineering, process engineering and maintenance engineering and other technical staff.

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 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.

Accommodation

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

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

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**. 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.

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. Basem Al-Qarout is a **Senior Process & Chemical Engineer** with over **35 years** of extensive teaching and field industrial experience. His expertise covers **Fundamentals of Process Operations**, **Hydrocarbon Processing**, **Process Plant Start-Up & Commissioning**, **Crude Oil & Refinery Products**, **Sampling & Feed/Product Quality**, **Process Troubleshooting & Problem Solving**, **Separation of Oil/Gas/Water**, **Oil Field Operations**, **Gas Field Operations**, **Oil Production**, **Gas Processing**, **Process Equipment Design**, **Operation of Process Equipment**, **Hydro-Treating**, **Hydro-Forming**, **Hydro-Cracking** and **Catalyst Technology.** Furthermore, he is also well-versed in **P&ID** and **Wiring Schematics Rotating Equipment-Machinery** (**Pumps**, **Compressors**, **Turbines**, **Fans & Blowers**, **Electric Motors**, **Gears & Transmission Equipment**), **Static Equipment-Stationary**, (**Heat Exchangers**, **Distillation Column**, **How Trays Work**, **Process Heaters/Furnaces**, **Reboilers**, **Condensers**, **Piping System**, **Valves**) and **Process Control & Instrumentation** (**Process Control**, **Instrumentation**, **Control Valves**).

During Mr. Al-Qarout's career life, he has handled challenging positions wherein he has acquired his thorough practical and academic experience as the **Technical Instructor**, Senior **Production Foreman**, **Panel Operator** at **Hydro Cracking Plant** and **Plant Foreman** of various companies such as **Mellitah Oil and Gas B.V.**, **KNPC**, **Chevron**, **Jordan Refinery Company** and **Libya Oil Center**.

Mr. Al-Qarout has a **Diploma** in **Chemical Engineering** from the **Polytechnic University** in **Jordan**. Further, he is **Certified** by **City & Guilds** as **Level 2 & 3 NVQ Processing Operations: Hydrocarbons Assessor** and a **Certified Instructor** by **Haward Technology Train-the-Trainer Program**.

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

0900 – 0930	*Registration & Coffee*
0930 – 0945	*Welcome & Introduction*
0945 – 1000	***PRE-TEST***
1000 – 1100	***Introduction to Gas Sweetening:*** *Overview of Gas Sweetening in Upstream Oil & Gas (Impact of Wellhead Chemicals & Upstream Machine Oil Entrainment on Amine Process), its Importance & the Role of Gas Treatment in Meeting Product Specifications & Environmental Standards • Product Specifications • Storage*

1100 – 1115	*Break*
1115 – 1130	***Chemistry of Acid Gases:*** *Understanding the Properties & Behavior of CO2, H2S & Other Sour Gases in Natural Gas Streams*
1130 – 1200	***Amine Gas Sweetening Basics:*** *Introduction to the Amine Process, Types of Amines Used (MEA, DEA, MDEA, DGA & Specialty Formulated Amines, Sulfinol, Solexol, Selection Criteria & their Specific Applications*
1200 – 1300	*Lunch*
1300 – 1430	***Amine Gas Sweetening Basics:*** *Filtration, Reclaimer & Packed Columns*
1430 – 1445	*Break*
1445 – 1650	***Amine Gas Sweetening Basics:*** *Filtration, Reclaimer & Packed Columns (cont'd)*
1650 – 1700	***Recap*** *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*
1700	*End of Day One*

Day 2

0900 – 1015	***Amine System Components & Design:*** *Detailed Examination of the Amine Separator (Effective Inlet Separation for Gas Sweetening Process), Contactor, Regenerator, Heat Exchangers, Pumps & Strippers*
1015 – 1030	*Break*
1030 – 1200	***Operation of the Amine System:*** *Operational Parameters, Flow Rates, Temperature Controls & Amine Concentration Management*
1200 – 1300	*Lunch*
1300 – 1445	***Operation of the Amine System:*** *Operational Parameters, Flow Rates, Temperature Controls & Amine Concentration Management (cont'd)*
1445 – 1500	*Break*
1500 – 1650	***Maintenance & Safety Practices:*** *Routine Maintenance Tasks (Mechanical, Instrumentation, Control & APC, Safety Measures etc.), Safety Measures & Health Hazards Associated with Gas Sweetening and Dehydration, Plant Metallurgy & Corrosion*
1650 – 1700	***Recap*** *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*
1700	*End of Day Two*

Day 3

0900 – 1045	***Fundamentals of Gas Dehydration:*** *Purpose, Methods (Including TEG, Molecular Sieves) & the Importance of Water Removal from Natural Gas*
1030 – 1045	*Break*
1045 – 1200	***Design & Operation of TEG Dehydration Units:*** *Detailed Look at TEG System Components, Including the Glycol Contactor, Regenerator & Pumps, Plus Operational Best Practices*
1200 – 1300	*Lunch*
1300 – 1445	***Molecular Sieve Technology:*** *Understanding Molecular Sieves in Gas Dehydration, Including Design Considerations, Operation & Regeneration Processes*
1445 – 1500	*Break*

1500 – 1650	***Introduction to Demineralization in Gas Processing:*** *Overview of Demineralization, its Necessity in Gas Processing & Impacts on System Efficiency & Corrosion Prevention*
1650 – 1700	***Recap*** *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*
1700	*End of Day Three*

Day 4

0730 – 0830	***Demin System Design & Operation:*** *Detailing the Components & Operational Aspects of Demineralization Systems, Including Ion Exchange Processes & Membrane Technologies*
0830 – 0930	***Demin System Design & Operation:*** *Detailing the Components & Operational Aspects of Demineralization Systems, Including Ion Exchange Processes & Membrane Technologies (cont'd)*
0930 – 0945	*Break*
0945 – 1100	***Demin System Design & Operation:*** *Detailing the Components & Operational Aspects of Demineralization Systems, Including Ion Exchange Processes & Membrane Technologies (cont'd)*
1100 – 1215	***Advanced Process Integration:*** *Integrating Gas Sweetening, Dehydration & Demineralization Processes for Optimal Efficiency & Performance. Discussion on Process Simulation & Optimization Techniques*
1215 – 1230	*Break*
1230 – 1330	***Advanced Process Integration:*** *Integrating Gas Sweetening, Dehydration & Demineralization Processes for Optimal Efficiency & Performance. Discussion on Process Simulation & Optimization Techniques (cont'd)*
1330 – 1420	***Advanced Process Integration:*** *Integrating Gas Sweetening, Dehydration & Demineralization Processes for Optimal Efficiency & Performance. Discussion on Process Simulation & Optimization Techniques (cont'd)*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0900 – 1105	***Troubleshooting Amine Systems:*** *Identifying Common Operational Problems (Amine Foaming, Antifoam Options & Selection, Corrosion, Amine Losses, Gas slippage, Amine Degradation, Viscosity Changes) & their Solutions*
1105 – 1120	*Break*
1120 – 1200	***Troubleshooting Dehydration & Demin Systems:*** *Diagnosing & Addressing Issues in Dehydration & Demineralization Systems, such as Glycol Degradation & Ion Exchange Resin Fouling*
1200 – 1300	*Lunch*
1300 – 1445	***Troubleshooting Dehydration & Demin Systems:*** *Diagnosing & Addressing Issues in Dehydration & Demineralization Systems, such as Glycol Degradation & Ion Exchange Resin Fouling (cont'd)*
1445 – 1500	*Break*
1500 – 1615	***Operational Excellence & Cost Management:*** *Best Practices for Achieving Operational Efficiency, Reducing Operating Costs & Optimizing the Lifecycle of Gas Sweetening Facilities*

1615 – 1630	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1630 – 1645	***POST TEST***
1645 – 1700	*Presentation of Course Certificates*
1700	*End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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