

**COURSE OVERVIEW PE0310**  
**Gas Sweetening & Sulphur Recovery**

**Course Title**

Gas Sweetening & Sulphur Recovery

**Course Date/Venue**

May 26-30, 2024/Sama Meeting Room,  
 Pullman Doha West Bay, Doha, Qatar

**Course Reference**

PE0310

**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.***



Hydrogen sulfide, carbon dioxide, mercaptans and other contaminants are often found in natural gas streams. H<sub>2</sub>S is a highly toxic gas that is corrosive to carbon steels. CO<sub>2</sub> is also corrosive to equipment and reduces the Btu value of gas. Gas sweetening processes remove these contaminants so the gas is suitable for transportation and use.



This course presents a complete and up-to-date overview of the Gas Sweetening, Liquid Hydrocarbon Sweetening and Sulphur Recovery with emphasis on gas plant process operations. The process flow sheets of several Sweetening and Sulphur Recovery Processes will be used to illustrate how the various operations differ. The advantages, limitations, and range of applicability of each process will be discussed so that its selection and integration into the overall plant is fully understood and appreciated.

Upon completing this course, you will have a good understanding of Gas Sweetening, Liquid Hydrocarbon Sweetening and Sulphur Recovery. There are many methods that may be employed to remove acidic components (primarily H<sub>2</sub>S and CO<sub>2</sub>) from hydrocarbon streams. The available methods may be broadly categorized as those depending on chemical reaction, absorption, or adsorption. Processes employing each of these techniques are described. Many of the processes result in acid gas streams that contain H<sub>2</sub>S that may be flared, incinerated, injected or fed to a Sulphur Recovery Unit. Various Sulphur Recovery Processes (primarily The Modified Claus Process) are discussed. You will also learn the basic vocabulary unique to the industry.

### 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 and sulphur recovery and identify the safety precautions and the types of contaminants including their effects
- Discuss the concept of process selection as well as the chemical reaction processes used in gas sweetening and sulphur recovery
- Employ systematic methodology of inlet separation and filtration and distinguish their features and importance
- Identify the concept of flash tank and corrosion as applied in gas sweetening and sulphur recovery and acquire knowledge on foaming and materials
- Describe the principles of batch processes, SWS, amines and reclaimer and introduce the topic of liquid redox as applied in gas sweetening and sulphur recovery
- Explain the various physical and combination processes and gain an in-depth knowledge on caustic wash, alkaline process and liquid HC sweetening
- Discuss the amine plant process and modified claus plant as well as their practical application on gas sweetening and sulphur recovery
- Determine the mechanical consideration and process consideration of gas sweetening and sulphur recovery
- Carryout the procedure on re-heating operation as well as instrumentation and degasification and discover their features and functions

### Exclusive Smart Training Kit - H-STK<sup>®</sup>



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK<sup>®</sup>). The H-STK<sup>®</sup> 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 gas sweetening and sulfur recovery for managers, engineers and other technical staff who are directly involved in gas processing operations.

### 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:-


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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.

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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.

### Course Fee

**US\$ 6,000** per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

**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. Mervyn Frampton** is a **Senior Process Engineer** with over **30 years** of industrial experience within the **Oil & Gas, Refinery, Petrochemical** and **Utilities** industries. His expertise lies extensively in the areas of **Process Troubleshooting, Distillation Towers, Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation** Troubleshooting, **Distillation** Technology, Vacuum **Distillation, Distillation Column** Operation & Control, **Oil Movement**

Storage & Troubleshooting, **Process Equipment** Design, Applied **Process Engineering** Elements, **Process Plant** Optimization, **Revamping & Debottlenecking, Process Plant** Troubleshooting & Engineering Problem Solving, **Process Plant** Monitoring, **Catalyst** Selection & Production Optimization, Operations Abnormalities & Plant Upset, **Process Plant** Start-up & Commissioning, **Clean Fuel** Technology & Standards, Flare, Blowdown & Pressure Relief Systems, **Oil & Gas Field Commissioning** Techniques, **Pressure Vessel** Operation, **Gas Processing, Chemical Engineering, Process Reactors** Start-Up & Shutdown, **Gasoline Blending** for Refineries, **Urea Manufacturing** Process Technology, Continuous Catalytic Reformer (**CCR**), **De-Sulfurization** Technology, Advanced Operational & Troubleshooting Skills, Principles of Operations Planning, **Rotating Equipment** Maintenance & Troubleshooting, **Hazardous Waste Management & Pollution Prevention, Heat Exchangers & Fired Heaters** Operation & Troubleshooting, **Energy Conservation** Skills, **Catalyst Technology, Refinery & Process Industry, Chemical Analysis, Process Plant, Commissioning & Start-Up, Alkylation, Hydrogenation, Dehydrogenation, Isomerization, Hydrocracking & De-Alkylation, Fluidized Catalytic Cracking, Catalytic Hydrodesulphuriser, Kerosene Hydrotreater, Thermal Cracker, Catalytic Reforming, Polymerization, Polyethylene, Polypropylene, Pilot Water Treatment Plant, Gas Cooling, Cooling Water Systems, Effluent Systems, Material Handling Systems, Gasifier, Gasification, Coal Feeder System, Sulphur Extraction Plant, Crude Distillation Unit, Acid Plant Revamp and Crude Pumping.** Further, he is also well-versed in HSE Leadership, Project and Programme Management, Project Coordination, Project Cost & Schedule Monitoring, Control & Analysis, Team Building, Relationship Management, Quality Management, Performance Reporting, Project Change Control, Commercial Awareness and Risk Management.

During his career life, Mr. Frampton held significant positions as the **Site Engineering Manager, Senior Project Manager, Process Engineering Manager, Project Engineering Manager, Construction Manager, Site Manager, Area Manager, Procurement Manager, Factory Manager, Technical Services Manager, Senior Project Engineer, Process Engineer, Project Engineer, Assistant Project Manager, Handover Coordinator and Engineering Coordinator** from various international companies such as the **Fluor Daniel, KBR South Africa, ESKOM, MEGAWATT PARK, CHEMEPIC, PDPS, CAKASA, Worley Parsons, Lurgi South Africa, Sasol, Foster Wheeler, Bosch & Associates, BCG Engineering Contractors, Fina Refinery, Sapref Refinery, Secunda Engine Refinery** just to name a few.

Mr. Frampton has a **Bachelor's degree** in **Industrial Chemistry** from **The City University** in **London**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** and has delivered numerous trainings, courses, workshops, conferences and seminars internationally.

**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.

**Accommodation**

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

**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: Sunday, 26<sup>th</sup> of May 2024**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 – 0900	<b>Terminology</b>
0900 – 0930	<b>Safety Precautions</b>
0930 – 0945	Break
0945 – 1030	<b>Types of Contaminants</b>
1030 – 1115	<b>Process Selection</b>
1115 – 1200	<b>Chemical Reaction Processes</b>
1200 – 1215	Break
1215 – 1300	<b>General Considerations</b>
1300 – 1345	<b>Inlet Separation</b>
1345 – 1420	<b>Filtration</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day One

**Day 2: Monday, 27<sup>th</sup> of May 2024**

0730 – 0930	<b>Flash Tank</b>
0930 – 0945	Break
0945 – 1045	<b>Corrosion</b>
1045 – 1200	<b>Foaming, Material</b>
1200 – 1215	Break
1215 – 1330	<b>Batch Processes, SWS, Amines &amp; Reclaimer</b>
1330 – 1420	<b>Liquid Redox</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Two

**Day 3: Tuesday, 28<sup>th</sup> of May 2024**

0730 - 0830	<i>Physical Process</i>
0830 - 0930	<i>Combination Process</i>
0930 - 0945	<i>Break</i>
0945 - 1030	<i>Caustic Wash</i>
1030 - 1115	<i>Alkaline Process</i>
1115 - 1200	<i>Case Study</i>
1200 - 1215	<i>Break</i>
1215 - 1330	<i>Liquid HC Sweetening</i>
1330 - 1420	<i>Case Study - Amine Plant Process</i>
1420 - 1430	<i>Recap</i>
1430	<i>Lunch &amp; End of Day Three</i>

**Day 4: Wednesday, 29<sup>th</sup> of May 2024**

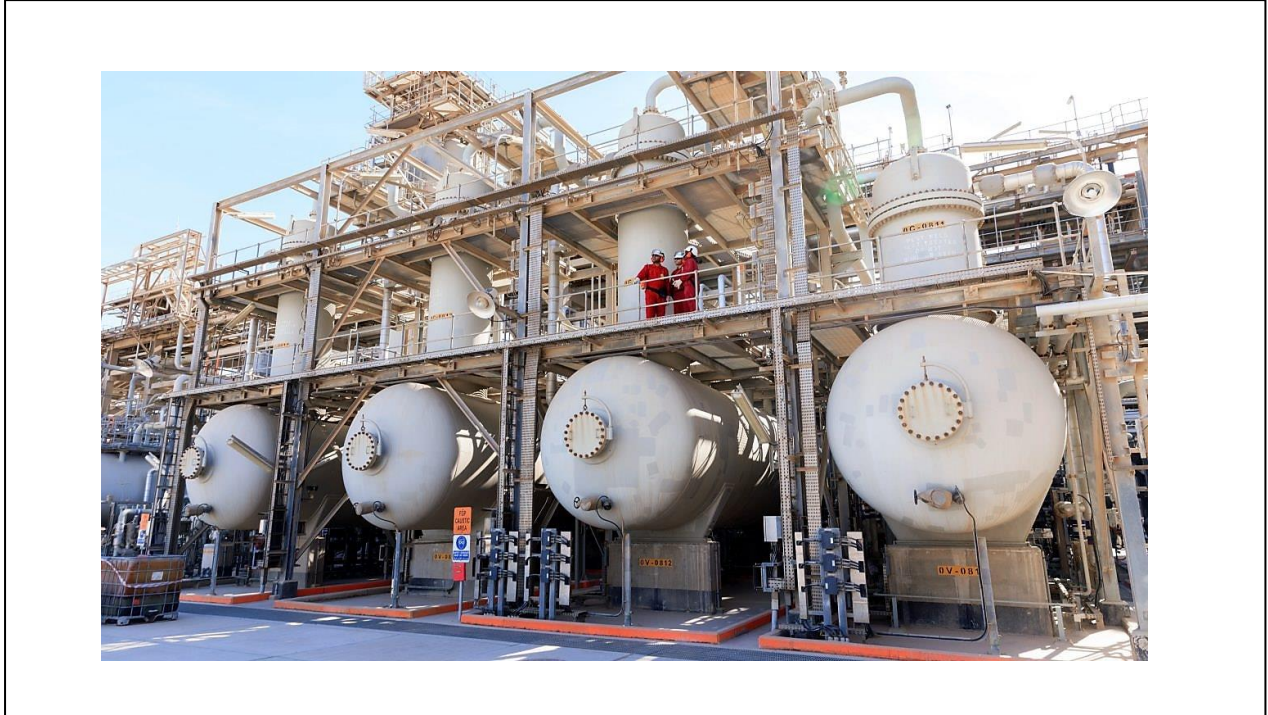
0730 - 0930	<i>Amine Plant Process</i>
0930 - 0945	<i>Break</i>
0945 - 1100	<i>Modified Claus Plant</i>
1100 - 1200	<i>Mechanical Consideration</i>
1200 - 1215	<i>Break</i>
1215 - 1420	<i>Process Configuration</i>
1420 - 1430	<i>Recap</i>
1430	<i>Lunch &amp; End of Day Four</i>

**Day 5: Thursday, 30<sup>th</sup> of May 2024**

0730 - 0930	<i>Re-Heating Operation</i>
0930 - 0945	<i>Break</i>
0945 - 1100	<i>Instrumentation, Degassification</i>
1100 - 1200	<i>Instrumentation, Degassification (cont'd)</i>
1200 - 1215	<i>Break</i>
1215 - 1345	<i>Case Study - Tail Gas Clean-up</i>
1345 - 1400	<i>Course Conclusion</i>
1400 - 1415	<b>POST-TEST</b>
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>

### Practical Sessions

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



### Course Coordinator

Jaryl Castillo, Tel: +974 4423 1327, Email: [jaryl@haward.org](mailto:jaryl@haward.org)