

COURSE OVERVIEW PE0300
Gas Treatment, Conditioning and Liquefaction

Course Title

Gas Treatment, Conditioning and Liquefaction

Course Date/Venue

Session 1: January 12-16, 2025/Boardroom 1,
Elite Byblos Hotel Al Barsha, Sheikh
Zayed Road, Dubai, UAE

Session 2: July 14-18, 2025/Fujairah Meeting
Room, Grand Millennium Al Wahda
Hotel, Abu Dhabi, UAE



Course Reference

PE0300



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 complete and up-to-date overview of gas conditioning and processing technology. It covers product specifications and the processes available to condition the gas in order to meet these requirements. Participants will understand the nature and purpose of key gas processing operations, and how the individual operations are integrated into plants to process diverse feed streams received from gas fields around the world.



This course will provide participants with a working knowledge of the major processes for Dehydration, Acid Gas Removal (Gas Sweetening), Hydrocarbon Dewpoint Control (HCDP Control), LPG Production, NGL Recovery and Separation (Fractionation), Sulphur Recovery and Tail Gas Clean-up. Participants will also learn the basic vocabulary unique to the industry and the key physical and chemical properties of natural gas constituents.



This course will also cover the important considerations of the design and selection of key process equipment including Separators.

Basic properties of hydrocarbon gases and the behaviour of water-hydrocarbon systems will be discussed. Participants will learn how to calculate system energy changes. This course will discuss the design and operational aspects of process control systems, separation equipment, absorption and fractionation facilities. Further, the methods used for dehydrating natural gas will be covered within the duration of this important course.

Course Objectives

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

- Apply and gain an in-depth knowledge on natural gas conditioning, treatment and processing
- Identify the various types of separators and their sizing and become acquainted with slug catcher and twister supersonic separator
- Recognize the role & importance of water content & dew point applied in gas conditioning & processing technology
- Enumerate the formation, prediction and inhibition of hydrates and discuss the process of liquid desiccant dehydration
- Determine the operating variables of gas conditioning & processing technology and recognize enhanced glycol concentration and solid desiccant
- Analyze the process of hydrocarbon recovery (NGL) and discuss mechanical refrigeration
- Emphasize the thermodynamics of gas and employ the removal of acid gases such as H₂S, CO₂, CS₂, COS & RSH
- Discuss the pH diagram of propane and develop an understanding on liquid ethane recovery
- Review & improve the amine process, corrosion, process control, physical, combined & sulfinol processes
- Carryout the operation & control of natural gases as well as the sulphur recovery
- Describe the chemical reaction of natural gases and gain in-depth knowledge on claus process variations and claus combustion operation
- Identify the re-heating options and the mechanical considerations of natural gases
- Employ catalyst converter operation and distinguish the tail gas clean up options

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Howard 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 gas conditioning, treatment & processing technology for those who are directly involved in supervising gas processing operations; managers and engineers involved in the planning and development of new gas processing facilities or modifying existing facilities; those who are involved in the negotiation of contracts for the sale of Natural Gas, LPG and NGL Products; and newly employed engineers and other technical staff in the oil and gas processing industry will find the course particularly relevant. Those employed in the activities that support the gas processing industry will also receive considerable benefit from the broad overview.

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® (Howard 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:-

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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.

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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.

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. Mohammad Hamami, is a **Senior Process Engineer** with an extensive practical experience within the **Oil, Gas, Refinery, Petrochemical** and **Power** industries. His experience covers **Clean Fuel Technology & Standards, Clean Fuel Specification, Emission Regulation, Crude Oil Production, Desulphurization, Synthesis Gas Production, Naphtha Isomerization, Diesel Fuel Additives, Storage Tanks Filtration, Fuel Quality Inspection, Process Plant Troubleshooting & Engineering Problem Solving, Process Equipment Operation, Process Plant Operation, Process Plant Start-up & Comissing, Process Plant Optimization, Oil & Gas Field Operation, Oil Movement, Storage & Troubleshooting, Petroleum Refinery Process, Process Reactor Operation & Troubleshooting, LPG Oil & Gas Operation & Troubleshooting, Crude Oil & LNG Storage, LNG & LPG Plants Gas Processing, Refinery Process Operations Technology, Liquid Bulk Cargo Handling, Gas Conditioning & Processing Technology, Distillation Column Design & Operation and Gasoline & Diesel Fuel Technology**. Further he is also well-versed in **Refinery Operational Economics & Profitability, Aromatics Manufacturing Process, Hydrogen Production Operation, Steam Reforming Technology, Gas Treating, Hydro-treating & Hydro-Cracking, Catalyst Material Handling, Gas Sweetening & Sulfur Recovery, Hydro Carbon Dew Point (HCDP) Control, Heat Exchangers & Fired Heaters, Amine Gas Sweetening, Plastic Additives Selection & Application, Crude & Vaccum Process Technology, Flare & Pressure Relief Systems, Stock Management & Tank Dipping Calculation, NGL Recovery & Fractionation, Refrigerant & NGL Extraction and Catalytic Craking & Reforming**.

During his long professional career, Mr. Mohammad worked as a **Refinery Manager, Operations Manager, Section Head/Superintendent** and **Process Engineer for Process Units, Utilities & Oil Movement** in various companies. He has been responsible for a number of **technological-driven world-scale hydrocarbon processing projects** from **beginning to successful start-up**.

Mr. Mohammad has a **Bachelor's degree in Chemical Engineering**. He is an **active member** of the **American Institute of Chemical Engineers (AIChE)** and has presented **technical papers** at its **several national meetings**. He has largely participated in the **start-up of seven world-scale process plants** which made him an **International Expert in Process Plant Start-Up and Oil Movement** and a **Certified Instructor/Trainer**.

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

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0900	<i>Introduction to Natural Gas Processing</i>
0900 – 0930	Contract Terms <i>Gas Contracts • Liquid Contracts</i>
0930 – 0945	Break



0945 – 1045	Separators <i>Types of Separators</i>
1045 – 1115	Separator Sizing
1115 – 1230	Slug Catcher
1230 – 1245	<i>Break</i>
1245 – 1320	Twister Super Sonic Separator
1320 – 1420	Case Study
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Water Content & Dew Point <i>Sweet/Sour Gas • Calculation Charts</i>
0830 – 0930	Hydrates <i>Formation, Prediction and Inhibition • Examples</i>
0930 – 0945	<i>Break</i>
0945 – 1045	Liquid Desiccant Dehydration <i>TEG Process</i>
1045 – 1115	Operating Variables
1115 – 1230	Enhanced Glycol Concentration
1230 – 1245	<i>Break</i>
1245 – 1320	Solid Desiccant
1320 – 1420	Case Study
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 – 0900	Hydrocarbon Recovery (NGL) <i>Solid Desiccant Short Cycle Units (HRU's) • Joule-Thompson (JT) Plants • Mechanical Refrigeration Plants</i>
0900 – 0930	Mechanical Refrigeration
0930 – 0945	<i>Break</i>
0945 – 1045	Thermodynamics of Gas
1045 – 1230	Removal of Acid Gases (H₂S, CO₂, CS₂, COS & RSH) <i>Batch Processes • Amines • Physical Solvents</i>
1230 – 1245	<i>Break</i>
1245 – 1345	pH Diagram of Propane
1345 – 1420	Case Study
1420 – 1430	Recap
1430	<i>Lunch & End of Day Three</i>

Day 4

0730 – 0800	Liquid Ethane Recovery
0800 – 0900	Gas Sweetening <i>Introduction • Batch Process • Mercury Removal</i>
0900 – 0930	Amine Process
0930 – 0945	<i>Break</i>
0945 – 1015	Corrosion



1015 - 1045	Process Control
1045 - 1115	Physical Process
1115 - 1230	Combined Process
1230 - 1245	<i>Break</i>
1245 - 1315	Sulfinol Process
1315 - 1345	Operation & Control
1345 - 1420	Case Study
1420 - 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

0730 - 0830	Sulphur Recovery <i>Modified Claus Plants & Tail Gas Clean-up</i>
0830 - 0930	Chemical Reaction
0930 - 0945	<i>Break</i>
0945 - 1015	Straight through Operation
1015 - 1045	Claus Process Variations
1045 - 1115	Claus Combustion Operation
1115 - 1145	Re-heating Options
1145 - 1230	Mechanical Considerations
1230 - 1245	<i>Break</i>
1245 - 1315	Catalyst Converter Operation
1315 - 1345	Tail Gas Clean Up Options
1345 - 1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Practical Sessions

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



Course Coordinator

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