COURSE OVERVIEW PE0310
Gas Sweetening & Sulphur Recovery

Course Title
Gas Sweetening & Sulphur Recovery

Course Date/Venue
January 21-25, 2024/TBA, The H-Hotel, Sheikh Zayed Road, Dubai, UAE

Course Reference
PE0310

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.

Hydrogen sulfide, carbon dioxide, mercaptans and other contaminants are often found in natural gas streams. H_2S is a highly toxic gas that is corrosive to carbon steels. CO_2 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_2S and CO_2) 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_2S 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®

*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, sample video clips of the instructor's actual lectures & practical sessions during the course 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:-

- 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.

- 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$ 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 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. Attalla Ersan, PEng, MSc, BSc, is a **Senior Process & Instrumentation Engineer** with over **35 years** of extensive experience within the **Oil & Gas**, **Hydrocarbon** and **Petrochemical** industries. His expertise widely covers the areas of **Compressor** Control, **Control Valves**, **Emergency Response** Planning, **Boiler & Steam** System Management, **Process Control** Design & Plant Modelling, **Process** Instrumentation & Automation, **Process Control** Instrumentation, **Analyzer Measurement** Systems, **Pressure** Management, Selection & Sizing of all Instrumentation, **Power Transformers**, **Power System** Analysis, **Power Supply** Substations, **Electric Power System** Operation, Fundamentals of **Power System Equipment**, **Power System Stability**, **Power System Harmonics** Analysis, Mitigation & Solution Strategies, **Power System**, Generation & Distribution, **AC & DC Motors**, **Substations, Switchgears & Distribution**, **Electro-mechanical Protection Relays**, Engineering Drawings, Industrial **Power System Coordination**, Distributed Control System (**DCS**), **Honeywell TDS 3000 DCS**, **Liquid** and **Gas Flowmetering**, **Meter** Calibration and **Process Analyzer & Analytic Instrumentation**. Further, he is also well-versed in **Gas Sweetening & Sulphur Recovery**, Crackers Feed **Gas Sweetening** & Amine Washing Unit, **Process Plant** Operations, **Process Control**, Instrumentation, Troubleshooting & Problem Solving, **Process Plant** Startup & Operating Procedure, **Control Room** Emergency Response, **SIL Criteria**, Calibration & Configuration of Installed Instrumentation **PLC & DCS** and **Bearing** Replacement, **Permit to Work** System, Hazard and Operability (**HAZOP**) Study, Process Hazards Analysis (**PHA**), **HAZOP** Facilitation, **Loss Prevention**, Consequence Analysis Application, **Gas Detectors** Operation, **Accident/Incident Investigation** (**Why Tree Method**), **Occupational Exposure** Assessment, **Fire Fighting & First Aid**, **Environmental** Management and Basic **Safety** Awareness. Project Management, Human Resources Consultancy, Manpower Planning, Job Design & Evaluation, Recruitment, Training & Development and Leadership, Creative Problem-Solving Skills, Work Ethic, Job Analysis Evaluation, Training & Development Needs, Bidding & Tendering, Technical Report Writing, Supervisory Leadership, Effective Communication Skills and Total Quality Management (TQM). He is currently the **CEO** of **Ersan Petrokimya Teknoloji Company Limited** wherein he is responsible for the design and operation of Biogas Process Plants.

During his career life, Mr. Ersan has gained his practical and field experience through his various significant positions and dedication as the **Policy**, **Organization & Manpower Development Head**, **Training & Development**, **Head**, **Ethylene Plant – Pyrolysis Furnace Engineer**, **Production Engineer**, Process Training Coordinator, Ethylene Plant Shift Supervisor, Ethylene Plant Panel & Fit Operator, Process Training & Development Coordinator, **Technical Consultant**, and **Instructor/Trainer** for Qatar Vinyl Company Limited and Qatar Petroleum Company (QAPCO).

Mr. Ersan is a **Registered Professional Engineer** and has a **Master's degree** of **Education** in **Educational Training & Leadership** and a **Bachelor's degree** of **Petrochemical Engineering**. Further, he is a **Certified Instructor/Trainer** 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.

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, 21st of January 2024***

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

Day 2: ***Monday, 22nd of January 2024***

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

Day 3: Tuesday, 23rd of January 2024

0730 – 0830	***Physical Process***
0830 – 0930	***Combination Process***
0930 – 0945	*Break*
0945 – 1030	***Caustic Wash***
1030 – 1115	***Alkaline Process***
1115 – 1200	***Case Study***
1200 – 1215	*Break*
1215 – 1330	***Liquid HC Sweetening***
1330 – 1420	***Case Study – Amine Plant Process***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 24th of January 2024

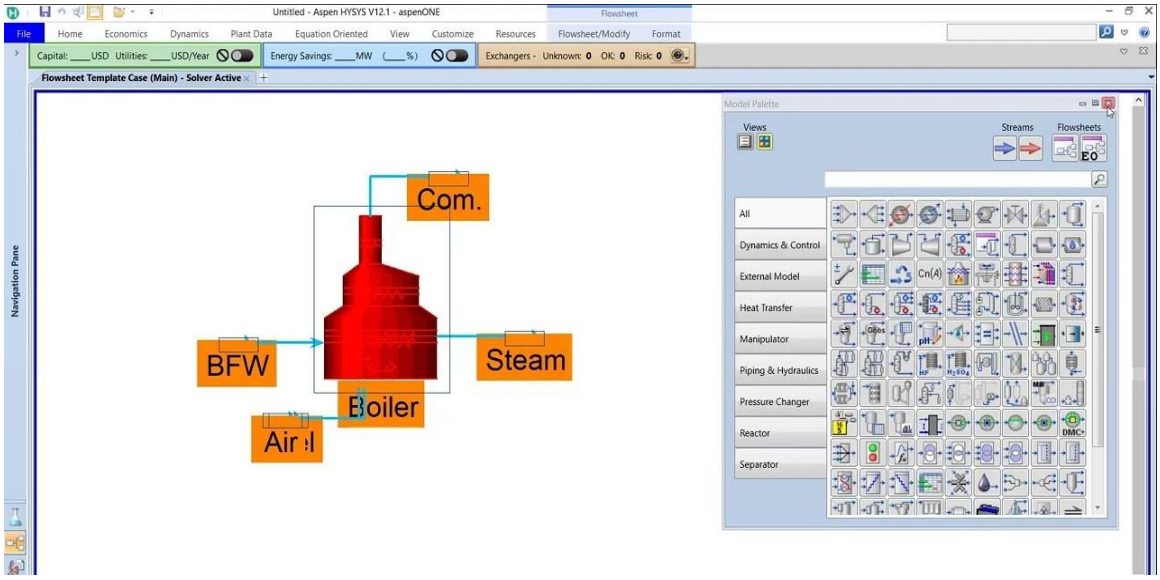
0730 – 0930	***Amine Plant Process***
0930 – 0945	*Break*
0945 – 1100	***Modified Claus Plant***
1100 – 1200	***Mechanical Consideration***
1200 – 1215	*Break*
1215 – 1420	***Process Configuration***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 25th of January 2024

0730 – 0930	***Re-Heating Operation***
0930 – 0945	*Break*
0945 – 1100	***Instrumentation, Degassification***
1100 – 1200	***Instrumentation, Degassification (cont'd)***
1200 – 1215	*Break*
1215 – 1345	***Case Study – Tail Gas Clean-up***
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 "ASPEN HYSYS" simulator.



ASPEN HYSYS V12.1 Simulator

Course Coordinator

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