



**Petroleum, Oil & Gas**



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Training and Development

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# Course: Amine Gas Sweetening& Sulphur Recovery

Code	City	hotel	Start	End	price	Hours
667	Beirut (Lebanon)	Hotel Meeting Room	2024-07-21	2024-07-25	3050 €	25

## The Course

The removal of acidic components (primarily H<sub>2</sub>S and CO<sub>2</sub>) from hydrocarbon streams can be broadly categorized as those depending on chemical reaction, or adsorption.

Processes employing each of these techniques are described. The principle process stream is the removal of the acid gases by counter flowing contact with an amine solution, commonly known as Amine Gas Sweetening.

The acidic components removed are termed acid gas streams (containing H<sub>2</sub>S,) and may be flared, incinerated, or converted to elemental sulphur in a Sulphur Recovery Unit. Various Sulphur Recovery processes (primarily The Modified Claus Process) are discussed.

## The Goals

Participants attending this programme will:

- Demonstrate an understanding of Amine sweetening and Sulphur Recovery technologies.
- Grasp an explanation of the key features of gas treating
- Discuss the thermodynamics of gas processing
- Identify the main process steps
- Evaluate, monitor, and troubleshoot gas treating operations

## The Delegates



**The course is specifically designed to be of substantial benefit to personnel within the Oil and Gas Industries such as:**

- Technologists,
- Mechanical engineers,
- Inspection engineers
- Maintenance or project engineers.
- Operations personnel

It is designed for both technical and non-technical personnel as well as operational staff at professional level employed in refineries, petrochemical, and oil and gas process industries.

It will serve as an introduction to acid gas removal and sulphur recovery technology for those who are unfamiliar with the subject and will also assist those who need the ability to progress to a detailed knowledge of the gas processing technologies.

## **The Process**

Amine Gas Sweetening and Sulphur Recovery is a hands on, stimulating learning experience. The programme will be highly interactive, with opportunities to advance your opinions and ideas. Participation is encouraged in a supportive environment.

To ensure the concepts introduced during the programme are understood, they will be reinforced through a mix of learning methods, including lecture style presentation, open discussion, case studies, simulations and group work.

## **The Benefits**

**The knowledge gained in this seminar will:**

- Enable the delegate to develop a proactive operating regime within the organization
- Allow accurate troubleshooting practices to be applied to the gas processing and H<sub>2</sub>S removal processes.



- Enable the delegates to optimize the safe operation of Amine and H<sub>2</sub>S units.
- Give the delegates' confidence to carry out operational supervision of the Units.
- Provide a basis for decision making regarding optimization of gas treatment and sulphur recovery units

## The Results

Delegates will acquire the knowledge and skills necessary to understand the key elements of Amine processes and operation and to apply this knowledge effectively to improve overall unit plant efficiency. This will enhance their competence and performance level and making additional value added contributions to their organizations.

- Understanding of Amine Gas Processing Units' operating and maintenance techniques.
- Familiarization of Sulphur Recovery process operating, and design, considerations
- Ability to put in place measures to maximize efficient operation.
- Improve process optimization techniques
- Interface with other gas processing units.

## The Course Content

### Day One

#### Gas Sweetening

- General Considerations and Safety
- Types of Contaminants
- Gas specifications



- Heating Value
- Sulphur Content
- Water Content
- Commercial Gases
- Ethane. Propane LPG

## **Day Two**

### **Alkanolamine Processes**

- Process Selection and Classification
- Chemistry of Amine Gas Sweetening
- Operating Problems
- Selective Sweetening Systems
- Process Flow and General Design Criteria / Guidelines
- MEA
- DEA
- MDEA
- DGA



- DIPA
- Formulated Solvents
- Sterically Hindered Amines

### **Day Three**

#### **Amine System Design**

- Design Procedures for Amine Systems:
- amine absorber
- amine circulation rates
- flash drum
- amine reboiler
- amine stripper
- overhead condenser and reflux accumulator
- rich/lean amine exchanger
- amine cooler
- amine solution purification
- materials of construction



- General Operating Problems in Amine Processes:

- corrosion
- solution degradation
- foaming
- amine reclaiming
- filtration
- foam inhibitors
- corrosion inhibitors

- General Considerations for Amine Processes:

- inlet scrubbing
- amine losses
- filtration
- amine-amine heat exchanger
- amine regeneration

## **Day Four**

### **Sulphur Recovery**



- Claus Process Considerations and Modifications
- Typical PFD – 3 Stage
- Process Considerations
- Mechanical Considerations
- Instrumentation
- Tail Gas Handling
- Incineration
- Clean-up
- SO<sub>2</sub> Recovery Process
- H<sub>2</sub>S Recovery Process
- Direct Oxidation Process
- Liquid Redox

### **Day Five**

- The EUROCLAUS Concept
- SCOT
- Claus Process Calculations and Exercises





- Sulfur Product Specifications
- Sulfur Storage and Handling
- Safety and Environmental Considerations
- Sulfur Recovery
- Troubleshooting: what can go wrong
- Course review and evaluation



**The Scandinavian Academy employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:**

- **Theoretical Lectures:**
  - We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.
- **Scientific Assessment:**
  - We evaluate trainees skills before and after the course to ensure their progress.
- **Brainstorming and Interaction:**
  - We encourage active participation through brainstorming sessions and applying concepts through role play.
- **Practical Cases:**
  - We provide practical cases that align with the scientific content and the participants specific needs.
- **Examinations:**
  - Tests are conducted at the end of the program to assess knowledge retention.
- **Educational Materials:**
  - We provide both printed and digital scientific and practical materials to participants.
- **Attendance and Final Result Reports:**
  - We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.
- **Professionals and Experts:**
  - The programs scientific content is prepared by the best professors and trainers in various fields.
- **Professional Completion Certificate:**
  - Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.
- **Program Timings:**
  - Training programs are held from 10:00 AM to 2:00 PM and include buffet sessions for light meals during lectures.