

TRAINING TITLE

SOUR GAS SWEETENING UNITS

Training Duration

5 days

Training Venue and Dates

Ref. No. PE125	Sour Gas Sweetening Units	5	21-25 Apr. 2025	\$5,500	DUBAI, UAE
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

The Sour Gas Sweetening Units Course is a comprehensive program designed to provide professionals with the knowledge and skills required to operate, design, and maintain sour gas sweetening systems used in the oil, gas, and petrochemical industries. Sour gas, which contains harmful impurities like hydrogen sulfide (H₂S) and carbon dioxide (CO₂), must undergo a sweetening process to remove these acid gases before it can be safely processed or utilized. This course covers various technologies, with a focus on amine gas treating systems and their alternatives, including key principles, design considerations, operational challenges, safety aspects, and environmental impacts.

TRAINING OBJECTIVES

By end of course participants will be able to understand

- Understand Sour Gas Composition and Properties: Learn the nature of sour gas and the associated impurities, such as H₂S and CO₂, and their significance.
- Gain Knowledge of Sour Gas Sweetening Technologies: Understand the various sweetening technologies, including amine gas treating, physical absorption, and newer advancements.
- Design Sour Gas Sweetening Units: Learn how to design sweetening systems, select the right process technology, and determine operational parameters.

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- Operate Amine Gas Treating Systems: Understand the principles of amine-based gas sweetening systems, including absorption, regeneration, and solvent handling.
- Troubleshoot and Maintain Sweetening Units: Develop skills for diagnosing and solving common problems in sour gas sweetening units, such as fouling, corrosion, and solvent degradation.
- Ensure Safety and Environmental Compliance: Learn the safety protocols and environmental regulations associated with sour gas sweetening operations, including H₂S handling and emissions control.

WHO SHOULD ATTEND?

- Process and chemical engineers
- Plant operators and technicians
- Maintenance engineers
- Environmental health and safety professionals
- Project managers in the oil and gas, petrochemical, and energy sectors
- Regulatory compliance officers

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

COURSE PROGRAM

Day 1: Introduction to Sour Gas and Sweetening

- Overview of Sour Gas
 - Composition and sources of sour gas (H₂S, CO₂, other impurities)
 - The need for sour gas treatment: safety, environmental, and economic considerations

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- Natural gas souring and its challenges
- **Basic Chemistry of Sour Gas Treatment**
 - Reactions of H₂S and CO₂ in gas sweetening
 - The role of acid gases in corrosion, toxicity, and environmental impact
- **Sweetening Technologies Overview**
 - Introduction to key sour gas sweetening methods
 - Amine gas treating, physical absorption, and emerging technologies
 - Selection criteria for sweetening technology based on gas composition

Day 2: Amine Gas Treating Process

- **Amine Gas Treating Basics**
 - Principles of amine absorption: chemical absorption and reaction with H₂S and CO₂
 - Types of amines used in sweetening: MEA, DEA, MDEA, and blends
 - Advantages and limitations of amine-based systems
- **Design of Amine Gas Treating Units**
 - Key components: absorber, regenerator, heat exchangers, and pumps
 - Design considerations: gas flow rates, pressure, temperature, and solvent choice
 - Sizing and optimizing the performance of sweetening units
- **Amine Regeneration**
 - Principles of amine solution regeneration
 - Stripping, heating, and re-cooling processes
 - Issues related to amine degradation and solvent loss

Day 3: Alternative Sour Gas Sweetening Technologies

- **Physical Absorption Technology**
 - Principles of physical absorption: solvents like Selexol and Rectisol
 - Solvent selection and regeneration methods
 - Applications of physical absorption in natural gas and petrochemical industries
- **Chemical Scrubbing**
 - Chemical scrubbing processes for CO₂ and H₂S removal
 - Applications and advantages of chemical scrubbing
 - Design and operation of scrubbers in sour gas treatment
- **Emerging and Advanced Technologies**
 - Newer approaches like membrane separation, adsorption, and hybrid systems
 - Pros and cons of advanced sour gas sweetening technologies
 - Future trends and innovations in sweetening systems

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Day 4: Operation, Troubleshooting, and Maintenance

- **Operational Challenges in Sour Gas Sweetening**
 - Common operational issues: pressure drops, foaming, fouling, and solvent degradation
 - Optimizing gas flow, temperature, and pressure for efficient sweetening
 - Managing H₂S concentrations and handling fluctuations
- **Maintenance of Sweetening Units**
 - Routine maintenance of amine systems and alternative sweetening systems
 - Equipment inspection and preventive maintenance practices
 - Handling fouling, corrosion, and scaling in the system
- **Troubleshooting Techniques**
 - Diagnosing and addressing common issues in sour gas sweetening systems
 - Case studies of troubleshooting process upsets and failures
 - Techniques for optimizing unit efficiency and performance

Day 5: Safety, Environmental Impact, and Regulatory Compliance

- **Safety in Sour Gas Sweetening Units**
 - H₂S hazards and personal protective equipment (PPE) requirements
 - Emergency response planning: leaks, releases, and toxic exposure
 - Safety management systems and control of toxic gas emissions
- **Environmental Regulations and Emissions Control**
 - Regulatory standards for H₂S, CO₂ emissions, and environmental protection
 - Sulfur recovery and handling of sulfur byproducts
 - Compliance with local and international environmental regulations (e.g., EPA, ISO)

NOTE:

Pre- & Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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