

€ TRAINING

Gas Processing Fundamentals





Gas Processing Fundamentals

Introduction:

This training program covers the principles and practices of treating natural gas for various applications. It emphasizes the theoretical understanding required for effective gas processing in the oil and gas industry.

Program Objectives:

At the end of this program, participants will be able to:

- Understand inflow and outflow performance, system analysis, and gas treatment processes in subsurface production operations.
- Gain knowledge of gas dehydration, absorption, refrigeration, fractionation, cryogenics, and LNG production.
- Familiarize with normal operating conditions and the scope of LNG NGL gas processing in oil and gas facilities.
- Learn transfer operations and measurement techniques in the gas field, including conversion factors and data analysis.
- Acquire an in-depth understanding of gas compression, natural gas processing, slug catchers, and NGL recovery, including handling abnormal conditions and instrumentation.
- Apply troubleshooting techniques and safety considerations, emphasizing the importance of water content and condensate stabilization in gas field operations.

Targeted Audience:

- Process engineers along with the petroleum and production engineers.
- Field operators and technicians.
- Other company staff involved in gas treatment and processing.
- Process engineers who are new to the profession.
- Managers and government officials and others involved with supervising gas processing operations.
- Managers involved in the planning and development of new gas processing facilities or modifying existing facilities.

Program Outlines:

Unit 1:

Introduction to Natural Gas Processing:

- What is Natural Gas Processing?
- Fundamentals of Natural Gas Engineering.
- Physical Properties of Natural Gas.
- Natural Gas Production.
- Impurities in the Gas.
- Contract Terms.
- Enhance coverage of LNG NGL gas processing scope.

Unit 2:

Gas-Liquid Separation Systems:

- Gas-liquid Separation System.
- Separators types of separators - separator sizing.
- Common Variables such as Pressure, Temperature, Flow, and Level.
- Instrumentation, Control, and Measurement of Natural Gas and Gas Liquids.
- Control Valves & Actuators.
- Pressure, Temperature, and Level Controls.
- Incorporate sections on transfer operations and measurement techniques, including conversion factors and data analysis.

Unit 3:

Mercury Removal Systems / Hydrate Problems / Dehydration of Natural Gas:

- Mercury Problem in Natural Gas.
- Process Description of the Mercury Removal Units.
- Hydrate Formation Conditions.
- Hydrate Prevention and Mitigation Methods.
- Water Content Estimation.

- Water Dew Point Control.

Unit 4:

Dehydration of Natural Gas / NGL Recovery and Removal of Heavy Hydrocarbon:

- Glycol Dehydration Unit.
- Process Description of the TEG Triethylene Glycol Dehydration Unit.
- Factors affecting the TEG Dehydration Unit Performance.
- Troubleshooting of the TEG Dehydration Unit.
- Removal of Heavy Hydrocarbons LTS & turbo expanders systems.
- Condensate Stabilization - Refrigeration System - Cryogenics Applications - Turbo-expanders.

Unit 5:

Sweetening Systems:

- Removal of Acid Gases H₂S, CO₂.
- Sweetening Systems: Membrane System.
- Troubleshooting & Problem Solving.
- Risk Management.
- Introduction to the Theory of Inventive Problem Solving.
- Effect of Maintenance on Operation.