MERCURY

Gas Conditioning & Processing

Istanbul - Turkey: +90 539 599 12 06
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London - UK: +44 748 136 28 02

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Introduction:

This training course covers the basic concepts and techniques necessary to design, specify, and manage gas field production facilities. It includes a complete and up-to-date overview of gas conditioning and processing technology and provides a clear understanding of the equipment and processes used in common separation and gas treating systems.

This course will also cover gas dehydration, sweetening, and gas processing operations, and the integration between the individual processing operations will be clarified. The gathering, separation, and final treatment systems for natural gas will be discussed, as well as the concepts of export quality natural gas, field, and fiscal measurement error. The products Natural Gas, Condensate, Commercial Propane and Commercial Butane, etc. specifications and the processes available to condition the gas to meet these requirements will also be covered.

Hydrocarbon reconciliation and allocation of produced fluids to the contributing reservoirs are explained and supported by exercises to cement the learning of the various topics treated. This training course will enable the participants to develop a “feel” for the important parameters of designing and operating a production facility. The participants will understand the uncertainties and assumptions inherent in designing and using the equipment in these systems and the limitations, advantages, and disadvantages associated with their use

Targeted Groups:

- 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

Course Objectives:

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At the end of this course the participants will be able to:

- Understand the inflow and outflow performance as well as the system analysis in subsurface production operations
- Understand gas treatment process
- Understand gas dehydration and processing, absorption, refrigeration and fractionation, cryogenics and LNG production
- Understanding the normal operating conditions of the plant
- Have a good background of oil and gas processing and be able to understand the scope of LNG NGL gas processing
- Become familiar with the transfer operations in the gas field and be able to carry out the measurement techniques
- Understand the conversion factors and be able to learn data analysis
- Acquire an in-depth understanding of gas compression, natural gas, slug catcher and NGL recovery
- Define abnormal conditions such as high liquid level, heat loss, tanks getting dry, foams, plugged outlets
- Learn about instrumentation, measurement, and control of natural gas and gas liquids in addition to gas facility maintenance
- Handle abnormal conditions such as loss of power, loss of control, loss of air, shortage of manpower, foam and hydrate formation, Troubleshoot the problems
- Emphasize the importance of water content in the gas field operations and be able to review & improve gas treatment
- Know the procedure of condensate stabilization
- Apply troubleshooting and safety considerations

Targeted Competencies:

- Gas conditioning and processing principles and systems
- Gas-liquid separation systems
- Mercury removal units
- Type of Dehydration Processes: Absorption and Alternative Operating Conditions
- TEG Equipment: Gas Scrubbers, Glycol Contactors, Flash Tank, Filters, Glycol Cooler, Re-generator and Stripping Gas
- Gas sweetening technologies
- Operation of conditioning systems
- Troubleshooting of equipment used in gas conditioning
- Basics on dew point depression units

Course Content:
Unit 1: Introduction to Natural Gas Processing:

- Fundamentals of Natural Gas Engineering
- Physical Properties of Natural Gas
- Natural Gas Production
- Impurities in the Gas
- Contract Terms
- Heating Value / BTU British Thermal Unit Importance
- Plant Normal and Abnormal Conditions
- Startup and Initial Operation
- Natural Gas Liquid NGL, Gas-to-Liquid GTL, Liquefied Petroleum Gas LPG

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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
- Field Application of Instruments
- Structured Approach to the Process Operation
- Contaminants Removal
- Process Plant Machinery Specific Plant Issues
- Management, Planning and Control
- Startup and Shutdown Planning & Control

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
- Dehydration Systems and Methods

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
- The Factors affect the TEG Dehydration Unit Performance
- Troubleshooting of the TEG Dehydration Unit
- The Nature of Process Problems Affecting Performance
- 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
- Managing, Environment, Safety and Quality Concern