Training Title

GAS CONDITIONING, TREATMENT OPERATION & PROCESSING

Training Duration

5 days

Training Venue and Dates

PE145	Gas Conditioning, Treatment Operation & Processing	5	22 – 26 December, 2019	$4,250	Dubai, UAE

In any of the 5 star hotels. The exact venue will be informed once finalized.

Training Fees

- **4,250 US$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch.**

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

The rapidly increasing worldwide demand for natural gas as an energy source requires expertise in gas engineering technology, which involves several production operations such as dehydration, acid gas removal, recovery of natural gas liquids and the production of liquefied natural gas. In addition, one involved in such industry needs to be familiar with different gas sources, specifications, storage requirements, transportation and distribution

This course will start by defining what natural gas is, its properties, specifications and end uses. Then, typical gas processing operations will be discussed, including dehydration, acid gas removal, recovery of ethane, propane and NGL (natural gas liquids), and liquefied natural gas (LNG) operations. Sulphur recovery, tail gas conditioning and process control will also be discussed. Typical equipment and facilities that are found in typical natural gas processing operations will also be discussed including compressors, vessels, relief systems and safety systems. Finally, the fundamentals of gas transportation and distribution will be discussed.

TRAINING OBJECTIVES

After Completion of this course the attendee will understand the following:

- The purposes and steps of natural gas conditioning and processing.
- Amine sweetening unit description and troubleshooting.
- Water content in natural gas.
- Hydrates; nature, formation conditions, prediction, and inhibition.
- Glycol dehydration unit; description, troubleshooting and design basis.

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- Molecular sieves dehydration unit; description, troubleshooting, and design basis.
- External refrigeration unit description.
- Gas expansion through J.T. valve and turbo-expander.
- Gas Fractionation different schemes.

WHO SHOULD ATTEND?

Technical and non-technical personnel involved in the activities of natural gas industry. Specifically, technical, operations and maintenance personnel who had limited exposure to this area, or professionals involved in other areas of the gas industry that require a comprehensive overview of natural gas processing will find this course ideally suited for them.

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 motivate everybody 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

DAILY OUTLINE

DAY 1:

1. Exploration & Production overview

- Introduction
- Entry Test
- Reservoir concept
- Drilling Completion
- Well Head & Christmas tree
- Onshore/offshore & Deep water Operations
- Technological developments
- Gathering Stations
- CPF Operations
- Separation principles
- 2 phase & 3 phase separators

2. Properties and Components of natural gas

- Composition

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- Explosivity-LEL& HEL%
- Toxicity
- Physical properties
- LPG-LNG-NGL Compositions
- Auto ignition temp
- Condensation temp
- Gas –liquid quilibrium
- Molar percentage
- McCabe & Thiele method for distillation

DAY 2:

3. Gas plant Operations (Central Processing Facility)

- Slug Catchers
- Gas compression principles
- Reciprocating Compressor Operation
- Centrifugal Compressor Operation
- Anti-surge & Control
- Scrubbers
- Heat Exchangers
- Vapour recovery system
- Gas Coolers
- Condensate extraction
- Condensate spiking with crude oil
- LNG process basics
- Gas Exporting
- Pigging Operation

4. NGL fractionation and recovery systems

- Mechanical refrigeration: principles and equipment
- Tray-type towers; packed towers
- Components of turboexpanderNGL recovery plants
- Turboexpander-compressor and utilities
- Principles of gas expansion NGL recovery and process variations

DAY 3:

5. Natural Gas Sweetening Process

- Basic theory
- Absorption process
- Amine solution and properties
- Contactor operations
- Amine stripping column
- Process Parameters & Control

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- Process Optimization
- Troubleshooting
- Case studies

DAY 4:

6. Natural Gas dehydration Process

- Basic principles
- Absorption medium
- Glycol solution and properties
- Glycol Contactor operations
- Glycol Regenerator
- Stripping gas
- Process Parameters & Control
- Dew point analyzers
- Process Optimization
- Glycol loss & reduction measures
- Troubleshooting
- Case studies

7. Glycol dehydration

- Process description & design considerations
- Operational problems
- Choice of glycol
- Safety, Physical Properties, Storage and Handling of
- Triethylene Glycol (TEG)

8. (TEG) Dehydration Process Description

- Glycol Contactor
- Inlet Separator
- The Regenerator
- Process Flow

9. Solid desiccant dehydration

- Desiccant capacity and selection
- Process description
- Design considerations
- Operational problems

DAY 5:

10. Refrigeration & Fractionation

- Refrigeration cycle
- Propane Compressors

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- Joule Thomson effect & applications
- Heat Exchanger principles
- Chillers Operation

11. Condensate Stabiliser Column

- Fractionation principles
- Fractionators column Operation
- Bubble caps trays
- Packed column
- Re-boiler & reflux
- Condensate spiking with crude oil
- RVP concept & control
- Zero flaring concept.

NOTE:

Pre & Post Tests will be conducted

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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