

# Gas Lift Design, Operations & Troubleshooting



## Table of Contents:

- Introduction
- Objectives
- Who should attend?
- Course Outline



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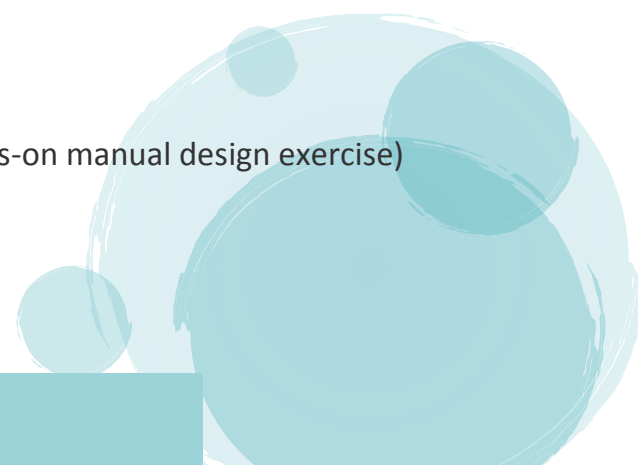
## Introduction:

Gas lifting oil wells is one of the most flexible and cost effective artificial lift techniques, the success of any gas lift system depends on an adequate and reliable source of lift gas. Deviated completions or sand production can be handled by gas lift completions, surveillance operations (PLTs, perforations) can be handled through tubing.

Well entries to replace gas lift valves are relatively cheap compared to other forms of artificial lift. The objective of this course is to provide a comprehensive understanding of the gas lift system, design and operation. The course will prove valuable to production and completion engineers who are involved in artificial lift selection and the design and troubleshooting of gas lift completions. This comprehensive course will give an in-depth view of the gas-lift design, operation and troubleshooting.

## Objectives:

**By the end of this BTS training course, participants will be able to:**

- The fundamentals of the gas-lift completion and the lift process
  - Understanding inflow and well outflow performance
  - How gas-lift valves work and gas-lift valve mechanics
  - How to design a gas lift completion (including a hands-on manual design exercise)
  - Gaslight troubleshooting and surveillance
  - Gaslight allocation to multiple wells
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## Who should attend?

Drilling Engineers, Senior Drilling Engineers, Drilling Supervisors, Work over Engineers, Petroleum Engineers, Completion Engineers, Tool Pushers, Reservoir and Senior Reservoir Engineers, Geologists, Production Engineers & technologists, Well site Engineers, Lifting Personnel, Maintenance Engineers, Foremen, Industry Personnel

## Course Outline:

- Introduction
- Basics Of Well Performance & Gas Laws
- Artificial Lift and Gaslight
- Inflow Performance
- What is Inflow Performance
- The straight line PI and the Vogel equation
- Multiphase Flow
- Holdup and Slippage
- Vertical Lift Performance
- Gradient Curves

- Empirical Correlations and Calibration
  - Gas Properties
  - Gas Properties and the Z-Factor
  - Gas Gradients
  - Volumes Stored in Gaslift Systems
  - Gas flow Through Orifice
  - Gaslift Components
  - Types of Gas-Lift
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- Single String Completions
  - Dual String Completions
  - Intermittent Gaslift
  - Gaslift Completions and Maintenance
  - Running, Pulling & Setting Gaslift Valves
  - SPM Types
  - Scaling Issues
  - Gas-Lift Valve Mechanics
  - Types of Gaslift Valves; Unbalanced & Balanced
  - Opening / Closing Pressure
  - Temperature Effects
  - Valve Setting Recommendations

- Gaslift Valve Models
- Design & Troubleshooting
- Gas-Lift Design
- Equilibrium Curve
- Depth of the Top Valve
- Design Examples: Valve Spacing

- Gas-Lift Surveillance and Troubleshooting
- Common Problems
- Use of the Two Pen Recorders and Gradient Survey's
- Gaslift Stability
- Liftgas Allocation
- Allocation of Liftgas to Multiple Wells
- Allocation Technique