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COURSE BROCHURE

# Advanced Gas Lift Design, Surveillance and Optimisation Training Course

10 – 21 October 2027
Abu Dhabi

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Registered in the United Kingdom and Saudi Arabia

# Advanced Gas Lift Design, Surveillance and Optimisation Training Course

**Ref:** 1167_43900 **Date:** 10 – 21 October 2027 **Location:** Abu Dhabi **Fees:** 9900 GBP

Gas Lift Design, Surveillance and Optimisation is a 2-week training course for production engineers, well surveillance engineers and artificial lift specialists, built around a field gas lift optimisation plan that sets valve designs, injection rates and surveillance routines well by well. Maturing reservoirs, rising water cuts and limited compression make every unit of lift gas count. Jupiter Prime Training delivers this Gas Lift Design, Surveillance and Optimisation course for artificial lift practitioners.

## Why Gas Lift Design, Surveillance and Optimisation Matters Now

Falling reservoir pressure and climbing water cuts push more wells onto gas lift, while compressor capacity and lift gas supply stay fixed. Real-time downhole gauges and production data systems now give engineers far more surveillance data than they can interpret by hand. Operators that design valves carefully and allocate gas on marginal response add oil without new wells; those that inject by habit waste compression, suffer heading and lose production to multipointing. The course rests on inflow performance relationships, multiphase flow correlations, valve mechanics and the marginal gas-oil ratio principle for field-wide allocation.

## Who Gains Most from Gas Lift Design, Surveillance and Optimisation

- Engineers who design unloading valve strings and select port sizes for new completions
- Specialists who monitor well tests, pressure surveys and downhole gauges for lift performance
- Engineers who set injection rates and allocate limited lift gas across a field
- Practitioners who diagnose unstable flow, heading and valve failures in producing wells
- Engineers who plan wireline valve change-outs and compressor capacity with operations

Production engineering groups gain most when design, surveillance and operations engineers from the same asset attend together and agree one allocation logic.

## Gas Lift Design, Surveillance and Optimisation Capabilities

Participants leave able to move from a well's inflow and tubing behaviour to a valve design, an injection target and a surveillance trigger that keep it lifting at its economic optimum.

- Design unloading valve spacing and settings for continuous gas lift completions — well completion approvals
- Calculate valve opening and closing pressures with temperature corrections — wireline change-out decisions
- Build gas lift performance curves from nodal models — injection rate setting
- Assess unstable flow, multipointing and heading from surveillance data — troubleshooting priorities
- Apply marginal response logic to allocate limited lift gas — compression and field production targets
- Specify surveillance routines and alarm limits for lifted wells — operations and control room teams

## Key Gas Lift Design, Surveillance and Optimisation Terms

- Continuous Gas Lift — injecting gas steadily into the tubing to lighten the fluid column and let reservoir pressure lift liquids.
- Unloading Valve — a valve above the operating point that opens in sequence to remove completion fluid, then closes.
- Operating Valve — the deepest open injection point through which lift gas enters the tubing during normal production.
- Gas Lift Performance Curve — a plot of oil or liquid rate against injection rate showing the optimum and diminishing returns.
- Multipointing — gas entering through more than one valve at once, wasting gas and reducing lift efficiency.
- Heading — cyclic surging of flow and pressure in a lifted well, causing production loss and facility upsets.

## Gas Lift Design, Surveillance and Optimisation Day by Day

## Day 1: Gas Lift in the Artificial Lift Portfolio

- Gas Lift Applications and Limits — Depth, Rate and Gas Availability
- Continuous Versus Intermittent Lift — Matching Method to Well Productivity
- Gas Lift System Components — Compressors, Manifolds, Mandrels and Valves
- Field Case Histories — Onshore Clusters and Offshore Platforms
- Lift Gas Economics — Compression Cost Versus Incremental Oil

## Day 2: Well Inflow and Tubing Behaviour

- Inflow Performance Relationships — Productivity Index and Vogel Behaviour
- Multiphase Flow Correlations — Pressure Gradient Selection and Matching
- Tubing and Flowline Sizing — Back-Pressure Effects on Lift
- Water Cut and Gas-Liquid Ratio Effects — Changing Lift Requirements
- Well Test Validation — Reconciling Rates With Model Predictions

## Day 3: Nodal Analysis for Lifted Wells

- Nodal Analysis Set-Up — Solution Node and Boundary Pressures
- Gas Lift Performance Curves — Optimum and Economic Injection Rates
- Injection Depth Sensitivity — Deepening the Operating Point
- Wellhead Pressure Sensitivity — Separator and Network Constraints
- Model Calibration — Tuning to Pressure Surveys and Tests

## Day 4: Valve Mechanics

- Injection Pressure Operated Valves — Opening and Closing Behaviour
- Production Pressure Operated Valves — Applications and Instability Risks
- Bellows Charge and Temperature Correction — Test Rack Settings
- Orifice and Venturi Valves — Operating Point Stability
- Valve Throughput and Port Sizing — Gas Passage Calculations

## Day 5: Unloading Design

- Unloading Sequence — Kick-Off Pressure and Completion Fluid Removal
- Valve Spacing Methods — Graphical and Software-Based Design
- Design Safety Factors — Pressure Drops Between Valves
- Mandrel Placement Planning — Future Depletion and Water Cut
- Design Verification — Flowing Gradient and Temperature Checks

## Day 6: Surveillance Data and Diagnostics

- Flowing Pressure and Temperature Surveys — Locating the Injection Point
- Downhole Gauges and Real-Time Data — Continuous Lift Monitoring
- Two-Pen and Casing Pressure Charts — Reading Valve Behaviour
- Acoustic Fluid Level Shots — Annulus Liquid Level Confirmation
- Exception-Based Surveillance — Alarm Limits and Review Cycles

## Day 7: Troubleshooting Unstable Flow

- Heading and Casing Instability — Causes and Choke Responses
- Multipointing Diagnosis — Valve Interference and Gas Waste
- Valve Leaks and Failures — Wireline Change-Out Prioritisation
- Hydrates, Wax and Scale in Lift Systems — Prevention Measures
- Troubleshooting Decision Trees — Structured Diagnosis for Each Symptom

## Day 8: Injection Optimisation

- Single-Well Optimisation — Moving to the Economic Injection Rate
- Injection Control Methods — Fixed Chokes and Automated Control Valves
- Dual Gas Lift Completions — Allocation Between Strings
- Intermittent Lift and Plunger-Assisted Options — Low-Rate Wells
- Optimisation Results Tracking — Incremental Oil and Gas Efficiency

## Day 9: Field-Wide Gas Allocation

- Marginal Gas-Oil Ratio Allocation — Ranking Wells by Response
- Compression and Distribution Network Constraints — Supply Limits
- Integrated Production Models — Wells, Network and Facility Together
- Allocation Under Upsets — Compressor Trips and Priority Lists
- Gas Lift Key Performance Indicators — Injection Efficiency and Uptime

## Day 10: Practising the Field Gas Lift Optimisation Plan

- Well Redesign Exercise — Applying Valve Spacing to a Depleted Well
- Survey Interpretation Case — Applying Diagnostics to an Unstable Well
- Allocation Simulation — Applying Marginal Response Across a Field
- Surveillance Routine Draft — Applying Alarm Limits and Review Cycles
- Field Gas Lift Optimisation Plan — Completing Designs, Targets and Surveillance

## Applying Gas Lift Design, Surveillance and Optimisation After the Course

- Build gas lift performance curves for the ten highest-injection wells and reallocate gas to wells with the strongest marginal response.
- Run flowing pressure surveys on two suspected multipointing wells and propose valve redesigns for the next wireline campaign.

## Gas Lift Design, Surveillance and Optimisation Questions FAQ

### What is gas lift design, surveillance and optimisation and why does it matter now?

It is the practice of designing gas lift valves, monitoring lifted wells and setting injection to maximise oil from limited lift gas. It matters now because maturing fields depend increasingly on gas lift while compression and gas supply stay constrained.

### Which roles gain most from gas lift design, surveillance and optimisation training?

Production engineers, well surveillance engineers and artificial lift specialists gain most. You benefit if you design valve strings, interpret surveys and well tests, troubleshoot unstable wells or allocate lift gas across a field.

### How does a gas lift design, surveillance and optimisation course differ from a general artificial lift course?

It goes deep on one lift method rather than comparing several. A general artificial lift course screens pumps and gas lift side by side, while this one covers valve mechanics, unloading design, diagnostics and field-wide gas allocation in detail.

## What do you bring back from gas lift design, surveillance and optimisation training?

You bring back a gas lift optimisation plan for your field. It holds valve redesign priorities, injection targets from performance curves, an allocation ranking and surveillance routines with alarm limits.

## Gas Lift Design, Surveillance and Optimisation: The Way Forward

The field gas lift optimisation plan first informs how lift gas is shared across wells at current compression capacity. Production engineers, surveillance teams and control room operators use it together in daily and weekly reviews. After its first use, revisit the performance curves as water cut rises and reservoir pressure falls, since each change moves the optimum injection rate.