

Course No. 1856

Subsurface Production Operations and Artificial Lift Technologies Training Course

UPSTREAM OPERATIONS, EXPLORATION, DRILLING, RESERVOIR &
PRODUCTION
OIL & GAS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

This comprehensive and advanced training course provides a practical understanding of subsurface production operations and artificial lift technologies used to maximize oil and gas production and improve well performance. The course connects reservoir conditions, well design, fluid behavior, completion systems, production performance, and artificial lift technologies to provide an integrated view of the factors influencing production from the reservoir to the surface.

The course covers the fundamentals of subsurface production operations, including fluid behavior, pressure relationships, well productivity, multiphase flow, completion components, downhole production equipment, and the identification of subsurface constraints that can limit production. Participants will learn how to evaluate well performance and identify opportunities to overcome production restrictions and operational challenges.

A major focus is placed on artificial lift technologies, including gas lift, electric submersible pumps, sucker rod pumping, progressive cavity pumping, and hydraulic pumping systems. Participants will examine the selection, application, operation, performance evaluation, and optimization of different artificial lift systems based on well depth, production rate, reservoir pressure, fluid properties, water and gas production, completion configuration, and operating conditions.

The course also integrates production surveillance, troubleshooting, reliability, energy efficiency, and lifecycle optimization. Through practical exercises and case studies, participants will develop the ability to analyze well and production data, diagnose declining performance, evaluate artificial lift systems, optimize operating conditions, reduce failures and production losses, and support well intervention and production optimization decisions.

Objectives

- By the end of the course, participants will be able to:
- Analyze the fundamental principles of subsurface production operations and their relationship to well performance.
- Evaluate fluid behavior, pressure conditions, and flow rates within producing wells.
- Assess completion components and downhole production equipment and their impact on well performance.

- Analyze well productivity and identify subsurface production constraints.
- Evaluate multiphase flow behavior and associated production challenges.
- Compare major artificial lift technologies and determine their appropriate applications.
- Evaluate reservoir, well, fluid, and production data required for artificial lift selection.
- Apply fundamental principles for artificial lift design and operation.
- Analyze pump and artificial lift system performance using production and operating data.
- Diagnose common subsurface production and artificial lift problems.
- Develop strategies to improve well productivity and reduce production losses.
- Improve system reliability, energy efficiency, and operating cost performance.

Who Should Attend

This course is designed for petroleum, production, reservoir, completion, and well engineers, as well as professionals involved in subsurface production operations, artificial lift, well performance, production optimization, and field operations.

It is particularly relevant for production engineers, artificial lift engineers, well performance engineers, production optimization specialists, completion engineers, intervention engineers, field production supervisors, and professionals responsible for monitoring and troubleshooting producing wells.

The course is also suitable for managers, supervisors, asset professionals, reliability and maintenance specialists, and decision-makers responsible for field production, well integrity, production optimization, artificial lift performance, intervention planning, and lifecycle asset performance.

Learning Outcomes

- Upon completion of this course, participants will be able to:
- Explain the fundamentals of subsurface production operations from reservoir to wellhead.
- Evaluate the major factors affecting well productivity and production performance.
- Analyze pressure relationships, production rates, and fluid behavior within producing wells.
- Assess completion systems and downhole production equipment.

- Analyze multiphase flow behavior and its impact on well performance.
- Determine when artificial lift is required and identify suitable lifting technologies.
- Select appropriate artificial lift systems based on reservoir, well, fluid, and production conditions.
- Evaluate pump and artificial lift system performance and identify efficiency limitations.
- Analyze production surveillance data to identify subsurface and artificial lift problems.
- Diagnose causes of declining production and artificial lift performance.
- Develop corrective actions and optimization strategies for producing wells.
- Evaluate the effects of water, gas, solids, scale, and changing fluid properties on production.
- Improve artificial lift energy efficiency and operating performance.
- Support well intervention, equipment replacement, and artificial lift redesign decisions.
- Develop integrated strategies for managing and optimizing well performance throughout the production lifecycle.

Course Outline

DAY 01

Fundamentals of Subsurface Production Operations and Well Performance

- The production system from reservoir to wellhead.
- Reservoir and fluid properties affecting production performance.
- Reservoir pressure, bottomhole pressure, and pressure relationships.
- Well productivity and factors influencing production rates.
- Fluid movement through the wellbore.
- Completion systems and downhole production equipment.

PRACTICAL APPLICATION

Analyze a producing well dataset and identify the primary factors affecting its production performance.

DAY 02

Subsurface Flow and Production Performance Analysis

- Fundamentals of fluid flow through production tubing.
- Multiphase flow in oil and gas wells.
- Effects of pressure, temperature, and fluid properties on wellbore flow.
- Pressure losses and flow restrictions.
- Effects of water, gas, solids, scale, and deposits on production.
- Identification of production constraints and declining well performance.

PRACTICAL APPLICATION

Analyze a declining production case and identify potential subsurface restrictions and performance limitations.

DAY 03

Artificial Lift Technologies and System Selection

- Principles, objectives, and applications of artificial lift.
- Gas lift principles, applications, operating considerations, and optimization.
- Electric submersible pump systems and their applications.
- Sucker rod pumping systems and operating principles.
- Progressive cavity pumping systems and application considerations.
- Hydraulic pumping systems and operating principles.
- Artificial lift selection criteria based on well and reservoir conditions.

PRACTICAL APPLICATION

Compare artificial lift technologies and select the most appropriate system for different well scenarios.

DAY 04

Artificial Lift Operation, Performance and Optimization

- Artificial lift performance monitoring and production surveillance.
- Evaluation of operating points, system efficiency, and production response.
- Gas injection optimization and operating parameter adjustments.
- Optimization of electric submersible pumps and mechanical pumping systems.
- Common artificial lift operating problems and their causes.
- Pump performance degradation and failure diagnosis.
- Reliability improvement, downtime reduction, and equipment lifecycle management.

PRACTICAL APPLICATION

Diagnose an artificial lift performance problem and develop corrective and optimization actions.

DAY 05

Advanced Production Optimization and Lifecycle Management

- Optimizing well performance under changing reservoir and production conditions.
- Effects of declining pressure, increasing water production, and changing gas production.
- Managing scale, corrosion, solids, and fluid-related production challenges.
- Evaluating well interventions and artificial lift redesign requirements.
- Energy efficiency and operating cost optimization.
- Well and artificial lift performance indicators and trend monitoring.
- Integration of production engineering, artificial lift, and reservoir management.

FINAL WORKSHOP

Develop an integrated production optimization plan for a producing well, including well performance analysis, identification of subsurface constraints, artificial lift selection, operating optimization, troubleshooting, intervention priorities, and lifecycle improvement strategies.



Register or Request More Information

Course page: <https://quest-training.com/courses/subsurface-production-operations-and-artificial-lift-technologies-training-course>

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