N474: Artificial Lift Technology for Multi-Well Pads in Unconventional Plays

Instructor(s): Rajan Chokshi

Format and Duration

Classroom - 3 Days
Virtual - 6 Sessions

Summary

Business Impact: Participation in this course will provide attendees a **basic to skilled application level working knowledge of artificial lift and related production issues for multi-well pads in unconventional and tight resource plays**. Dynamic nature of unconventional reservoirs causes production instabilities, increased downtime, sub-optimal operations and higher equipment failures. This course teaches **proper selection** and **operation of artificial lift** that directly impact business bottom line by **improving production**, **minimizing downtime, reducing lease operating costs, and avoiding deferred production.**

Production optimization is also discussed, particularly real-time measurements and optimization techniques that are required to understand and manage the dynamic production scenarios. Besides the basics of artificial lift and real-time measurements, the training focuses on specific production and lift challenges related to the unconventional wells.

Learning Outcomes

Participants will learn to:

1. Formulate a problem statement and solution plans for production from unconventional and tight resource plays
2. Compare, contrast, and categorize various forms of artificial lift systems
3. Analyze the need for artificial lift systems in unconventional plays
4. Differentiate production and artificial lift challenges in unconventional from conventional assets
5. Assess the strengths and weaknesses of artificial lift methods in unconventional plays
6. Contrast artificial lift needs of liquid-dominated plays versus gas-dominated production
7. Understand the impact of artificial lift on the development of multi-well pads
8. Learn about advances in real-time approaches to the production monitoring and lift management
9. Estimate life cycle plans for artificial lift in unconventional plays

Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures, discussion of case studies, worked examples, and hands-on exercises.

Who Should Attend

This course is designed for:

- Junior- to mid-level production personnel who are responsible for shale fields development and production using artificial lift.
- Reservoir, completion, drilling, and facilities engineers working on shale development.
- Field and asset supervisors and managers interested in improving the performance of their

unconventional assets.

Prerequisites and Linking Courses

There are no prerequisites, but a basic understanding of petroleum production concepts is assumed.

Other courses with a complementary focus include N313 (Evaluating Resource Plays: The Geology and Engineering of Low Permeability Oil and Gas Reservoirs), N957 (Forecasting Production and Estimating Reserves in Unconventional Reservoirs), N973 (Reservoir Engineering for Unconventional Gas and Tight Oil Reservoirs), and N406 (Unconventional Resource Assessment and Valuation).

Course Content

Daily Agenda

Sessions 1 & 2

- Introduction to artificial lift systems & production optimization: What? Why? How?
- Production challenges specific to shale development
- Continuous gas-lift: Applications, benefits/limitations, components, design considerations
- Electrical submersible pumping: Applications, benefits/limitations, components, design considerations
- Hydraulic jet and piston pump

Sessions 3 & 4

- Reciprocating rod lift: Applications, benefits/limitations, components, design considerations
- Capillary injection: Application for lift and chemical treatment, components, design considerations
- Plunger lift: Gas well deliquification, components, design considerations
- Selection of artificial lift for shale wells
  - Variables specific to shale well ALS selection
    - PVT properties
    - Optimum drawdown and choking during early production
  - Strengths & weaknesses of applicable lift systems
  - Impact of lift selection on the development of multi-well pads – particularly surface facilities impact

Session 5 & 6

- Selection of artificial lift for shale wells (cont.)
  - Lift life cycle and elimination process
  - Application case studies in oil and gas wells
  - Brief economic comparison of artificial lift methods

- Digital oil field and production optimization
  - Real-time downhole and surface measurements
  - Role of software in visualization, analysis and surveillance