ADVANCED COMPLETION TECHNOLOGY DESIGN - ARTIFICIAL LIFT DRL037

COURSE DESCRIPTION

This course will cover expressions, axioms, and basic calculations regularly utilized by Production Techs. Emphasis is upon proven technology required to effectively develop and operate an asset in a multi discipline development environment. Practical application of technology will be emphasized. Both theory and actual field examples and well completion programs will be studied along with class problems, exercises, and videos. Analysis examples to assess well performance will be set up. Well completion equipment and tools will be viewed and discussed. Participants will work several exercises such as basic artificial lift designs, acidizing programs, gravel pack designs, and fracturing programs. The course presumes a general engineering or scientific background. It requires some basic knowledge of completion and production technology. It combines a review of the fundamental concepts of the subjects covered together with their practical application.

COURSE GOAL

To enhance the participants' knowledge, skills, and attitudes necessary to gain more advanced aspects of completion technology, specifically in artificial lift.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Apply and integrate production technology principles for oilfield project development.
- Choose basic well completion equipment configurations.
- Perform system analyses to optimize well tubing design and selection.
- Perform basic artificial lift designs.
- Apply the latest shale gas and oil extraction technologies.
- Design basic sand control gravel pack completions.
- Evaluate well candidate selection to conduct a hydraulic fracturing campaign.
- Apply new production technology advances for smart well completions.

WHO SHOULD ATTEND

- Exploration and production technical professionals
- Petroleum production and operation engineers who are already familiar with the basic completion processes but have a need to extend their area of understanding to cover more advanced aspects;
- Production Staff
- Engineers from disciplines other than Production Technology etc.

COURSE DURATION

5 Working Days

COURSE OUTLINES

1. Well Performance
    - Inflow & outflow performance
    - Completions inflow performance
    - Role and tasks of production technology
    - Computerized well performance prediction computer programs
    - Well performance sensitivities
    - Perforating & advanced perforating
        - Smart wells: applications and case histories
        - Coiled tubing completion strings
        - Downhole oil/water separation: technology & economic modeling
2. Artificial Lift Selection Techniques
    - Rod pump
        - Basic equipment design
        - Operating practices
    - Electrical Submersible Pumps
        - Basic equipment design
        - Components
        - Operating Practices
        - New applications
    - Hydraulic pumps
        - Basic equipment design
    - Progressive cavity pumps
        - Basic equipment design
3. Gas Lift
    - Introduction
    - Application
    - Design objectives
    - The unloading processes
    - Side pocket mandrels

- Gas lift valve mechanics
- Gas lift design
- Operational problems
- Gas lifted field optimization
- Intermittent gas lift
- New technology

4. Formation Damage
    - Concept of skin
    - Sources of skin
    - The many formation damage sources and the technique used to reduce its impact on well impairment
    - Formation damage during workovers
        - Prevention

5. Matrix Acidizing Treatments
    - Well stimulation economics
    - Well candidate selection
    - Design of matrix stimulation treatment parameters
    - Acid formulations, volumes, rates, additives, treatment type, diversion, etc.
    - Matrix stimulation campaign case histories
    - Stimulation of carbonate formations
    - Acidizing special well types
    - Coiled tubing jetting
    - Coiled tubing stimulations

6. Conformance Control
    - Sources of "bad" water
    - Matrix and fracture shut-off treatments

7. Hydraulic Fracturing
    - Candidate selection guidelines
    - Fractured well inflow performance
    - The propped hydraulic fracturing treatment
    - Rock mechanical issues important to hydraulic fracturing
    - Fracture fluid & proppant selection

- Optimization of hydraulic fracture dimensions
- Tip screen out fracturing

8. **Unstable Formations and Sand Control**
   - Types of sand production
   - Fill removal with coiled tubing
   - Prediction of sand failure
   - Cost of sand control
   - Sand exclusion techniques
   - Detailed description of gravel packing technology
   - Chemical sand control
   - Sand control installation using coiled tubing
   - New technology
9. **Coiled Tubing**
   - Technology
   - Well unloading and kick-off
   - Drilling
   - Cementing
   - Electric line applications