



Well Intervention and Artificial Lift

Course Duration : 5 days

Type of Participant : This course is designed for Well Intervention Engineers, Petroleum Engineers, Drilling Engineers, Production Engineers, Field Technicians and Supervisors, Oil and Gas Operators and Service Company Personnel.

Summary:

A well intervention is any operation carried out on oil or gas well during its productive life that alters the state of the well, provides well diagnostics, or manages the production of the well.

Primarily in this training course, we are concerned with problems associated with the completion string. Problems associated with the reservoir can be investigated and evaluated using production logging and well test techniques. In general, problems associated with the completion string can be classified into problems which arise in the tubing bore and which can be corrected through tubing operations and problems which necessitate the retrieval of the completion string from the well.

This course will contain in-depth information on the impact of workovers and completion design in maximizing field production and increasing recoverable reserves. It also emphasizes the importance of well interventions methods (slickline, Electrical line and Coiled tubing) during lifetime of the well to keep well productivity under optimum conditions.

Furthermore, this course will present a complete overview of the most widely used artificial lift systems in the oil and gas industry. This course provides basic knowledge of Artificial Lift, review of fluid properties, multiphase flow regimes, and



all lifting methods: rod pumps, progressive cavity pumps (PCP), gas lifts, and electrical submersible pumps (ESP).

Objective:

Upon the successful completion of this course, participants will learn:

- Introduction to the variable nature of well interventions.
- Introduction to artificial lift methods
- Different types of artificial lift systems
- Describe the inherent risks and need for careful diagnostics, planning and supervision.
- Describe the economic implications of a workover in terms of the need to protect the well production or injection capacity.
- List and describe the equipment and operational concepts involved in coiled tubing and hydraulic workover units.
- Identify, evaluate and recommend functional capability of completion strings for a variety of situations.
- know the well control barrier principles
- Identify three barriers methodology during well intervention
- Know well control barrier classification for different type of well intervention method.
- Describe the mechanisms of a slick wireline operation.
- List and describe the commonly used downhole wireline equipment and tools.
- List and describe the surface wireline equipment requirements; lubricator; BOP; stuffing box.
- Describe well pressure control and safety issues associated with wireline.
- State the limitations on successful wireline operation imposed by depth, hole angle and dog leg severity
- learn procedures and equipment used in wireline, coiled tubing, and workover

Daily Program:

Day 1



Basic Well Completion Design, Practices and Strategies

- Well Integrity
- Well Completion Design Considerations
- Reservoir Considerations
- Mechanical Considerations
- Classification of Completions
- Lower and upper completion string components and selection consideration
- Cement Slurry calculations
- Cement Squeezing

Barriers and Containment Devices

- Cement Bond Logs
- Determination of Frac Gradient
- Perforating
- Acidizing
- Barrier terminology
- Barriers and containment devices
- Barrier envelope
- Barrier integrity testing
- Flow control devices (mechanical barriers)
- Well kill principles and procedures

Day 2

Wire Line Types, Tools, and Applications

- Introduction to wireline
- Types of wireline
- Basic tool strings
- Introduction to wireline fishing
- Stuffing box



- Wireline valve (bop)

Wire Line Types, Tools, and Applications (Cont.)

- Standard braided line rig up
- Wireline applications and operational consideration
- Matrix or Perforating?
- Fracturing Overview
- Sand Control Management
- Sand Cleanout

Day 3

Coiled Tubing Equipment and Applications

- Coiled Tubing surface and subsurface components
- Coiled Tubing applications
- Cleaning operations with CT
- Nitrogen calculations
- Alternatives to Workovers
- Well back flow (nitrogen lift)

Well Control Equipment and Procedures

- Pressure control equipment for wireline and Coiled Tubing
- Barrier elements for wireline and Coiled Tubing
- Pressure testing of all barrier elements
- Emergency of wire line operations (wire cut on surface or downhole, tools stuck, etc)
- Emergency of Coiled Tubing (Pin hole in CT surface or downhole, CT stuck, CT crack and etc.)
- Fishing
- Artificial Lift



Day 4

Introduction and Overview to Artificial Lift

- Introduction to Artificial Lift Techniques
- Overview of artificial lift methods
- Factors influencing artificial lift selection
- Importance of artificial lift optimization

Rod Pumping Systems

- Principles of rod pumping
- Design considerations and components
- Troubleshooting common issues

Day 5

Gas Lift Systems

- Gas lift principles and applications
- Gas lift valve types and operation
- Gas lift optimization strategies

Electrical Submersible Pumping (ESP)

- ESP system components and configurations
- ESP installation and operation
- ESP troubleshooting and maintenance

Hydraulic Pumping Systems & Integration



- Hydraulic Pumping Systems
 - Hydraulic pumping principles
 - Hydraulic pump types and applications
 - Hydraulic pumping optimization techniques
- Integration and Optimization
 - Integration of artificial lift systems with reservoir