

# SLICKLINE AND PERFORATING OPERATION FUNDAMENTALS

## DRL032

### COURSE DESCRIPTION

Work over operation in petroleum engineering is considered one of the very important topics to be discussed and investigated including the main operations with all associated activities and the obeyed methodologies. This course is focused mainly on perforating operation and services. It will also cover slicking and wire line services.

### COURSE OBJECTIVES

By the end of this course, participant will have covered:

- Work over petroleum engineering.
- Wire line.
- Cased Hole Logging.
- Perforations.

### WHO SHOULD ATTEND

- Petroleum engineers.
- Process engineers.

### COURSE DURATION

5 Working Days

### COURSE OUTLINES

1. Introduction to workover petroleum engineering
2. Perforation Services
  - Perforation Fundamentals.
  - Perforating Methods.
    - Shaped charge.
    - Bullet guns.
    - Abrasive perforation.
    - Explosives, types and shaped charges.
    - Perforation gun component.
    - Perforation geometry.
  - Overbalance and underbalance perforations.

### 3. Detonators

### 4. Firing heads

- Differential Pressure Firing Head.
- Hydraulic Delay Firing Head.
- Extreme overbalance firing head.
- Mechanical Firing Head.
- Slick line retrievable time delay firing head.
- Redundant Firing Systems.
- Trigger charge firing head.

### 5. Factors affecting perforator performance

- Effect of rock strength.
- Effect of in situ stress.
- Effect of sand grain size and distribution.
- Effect of rock density.
- Effect of pore-saturating fluid.
- Casing effects.
- Effect of wellbore pressure.
- Effect of Perforating in Various Fluids.
- Perforation damage and clean up
- Source of perforation damage.
- Consolidated hard rock.
- Weak rocks.
- Perforation clean-up.
- Underbalance criteria.
- Dynamic perforation for clean perforation.
- Near wellbore stimulation.
- Stim-Gun.
- Propellant technology.

### 6. Ancillary Equipment and accessories

- Underbalancing sub tool.
- Differential sub.
- Radioactive marker.
- Gun release.

- Shock absorber.
- Firing detection.
- Swivel sub.
- Wireline perforation.
- Slickline perforation.
- Coiled tubing perforation.
- Tubing conveyed perforation Oriented perforation.

## **7. Perforation Pressure Equipment**

- Objectives.
- Operation Principles.
  - Line Wiper.
  - Stuffing Box.
  - Grease injection head.
  - Tool catcher.
  - Lubricators.
  - BOP's.
- Equipment.
- Safety.
- Depth Correlation.
- Reservoir completion types.
- Perforation for Natural completion.
- Perforation for hydraulic fracturing.
- Perforation for sand production control, gravel packs, screen-less sand management
- Perforation in carbonates.
- Design of perforated completions (NODAL analysis, SPAN perforation analysis, ....).
- Underbalance calculations.
- Calculation of absolute firing pressure.

## **8. Slickline Equipment and services**

- Slickline services.
- Surface and subsurface equipment.
- Wire types.
- Slickline tool string.
- Auxiliary service tool.

- Running and Pulling tool.
- Slickline fishing.
- Sub-Surface safety valves.

#### **9. Cased hole wireline services**

- Formation evaluation in cased hole.
- Production logging.
- Casing and tubing evaluation.
- Cement evaluation.

#### **10. Cased hole logging procedures**

#### **11. Wireline, slick, fishing operations**

#### **12. Wire line jobs.**

- Tubing Gauging.
- Gas Lift Valve Change.
- Gas lift survey.
- Static pressure survey.

#### **13. Imaging tool (USIT), Cement bond log (CBL) and variable**

#### **14. Density log (VDL) also water flow log (WFL))**

#### **15. Coiled tubing and tractor operations**

#### **16. Surveying operations**

#### **17. Tools**

#### **18. Associated tests**

#### **19. Procedures and tests**

#### **20. Mud types and additives**

#### **21. Case studies**

