
N915: Introduction to Production Operations

Instructor(s): John Davies

Format and Duration

Classroom - 3 Days

Summary

This course provides an introduction to oilfield operations, equipment, practices and terminology. It covers equipment from the reservoir to the sales point, discussing function and malfunction, routine operations and day-to-day activity. The unique language of the oilfield is presented.

Learning Outcomes

Participants will learn to:

1. Establish the requirements of well completion including casing design and primary cementing.
2. Determine well completion strategies including horizontal and dual well completions.
3. Verify important considerations in well completion specifically completion and production fluids, pressure and temperature, safety valves and well head design.
4. Illustrate the range of surface facilities available, specifically oil and gas separators and water disposal systems.
5. Analyse different artificial lift systems and illustrate how and why certain types are used.
6. Compare common pumpjack methods including mechanical beam pumps and electric submersible pumps.
7. Analyse well performance from naturally flowing, gas lift and artificial-lift systems.

Training Method

A three-day classroom course, comprising lectures with worked examples, hands-on exercises and discussion; including a visit to an oilfield supply company.

Who Should Attend

Non-engineers with little or no background in reservoir, well or production engineering or operations. Additionally, the course may suit entry level engineers and others who have limited or no exposure to oil field operations. The course is deliberately designed to be broad in its coverage. It is also suitable for experienced engineers that are new to Petroleum Engineering.

Course Content

Production operations is a complex task that requires collaboration between many disciplines including subsurface and surface teams. This course will teach how these individual disciplines combine and contribute to the optimal delivery of an operating petroleum asset.

A. Completing an oil or gas well

- Logging a well
- Run casing: why?
- Casing design

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- Sizes, types, strengths
- Run liner hangers: why?
- Primary cementing
 - Cementing equipment
- Squeeze cementing
- Perforating

B. Well Completions

- Completion fluids
 - Single well completions, equipment and tools
 - Tubing, packers, sliding sleeves, landing nipples, expansion joints, seal assemblies
- Dual well completions, equipment and tools
 - Tubing, packers etc.
- Horizontal well completions
 - Kick-over tool, open hole completion etc.
- Important considerations in well completions
 - Pressure and Temperature
 - Production fluids
 - Tubing movements
- Safety valves in wells
 - Surface safety valve
 - Sub-surface safety valve (storm choke)
 - Surface controlled sub-surface safety valve (SCSSSV)
- Well heads
 - “Christmas tree” and valves on well-heads
 - Flow control choke

C. Surface facilities

- Oil and gas separators
 - Test separators
 - Fluid controls on separators
 - Fluid metering systems
- Heater treaters
- Tank batteries / Tank Farms
- Oil and gas distribution
- Water disposal

D. Treatment of oil and gas fluids

- Use of emulsifiers
- Scale inhibitors

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- Corrosion inhibitors
- Erosion
- Paraffin and asphaltene inhibitors

E. Artificial Lift

- What is artificial lift and why?
- Gas lift
- Plunger lift
- Down-hole hydraulic lift
- Jet pumps

F. Pumping methods

- ESP—Electric Submersible Pump
- HSP—Hydraulic Submersible Pump
- PCP---Progressing Cavity Pump
- MP --- Mechanical Beam/Rod Pumps

G. Optimization of Oil and Gas wells / analyzing well performance

- Natural flowing wells
- Gas-lift wells
- Pumping wells
- Training Method