

ARTIFICIAL LIFT: DESIGN & FAILURE ANALYSIS



DRPT255
Drilling,
Reservoir &
Petroleum
Training

COURSE TITLE

ARTIFICIAL LIFT: DESIGN & FAILURE ANALYSIS

COURSE DATE/ VENUE

13 - 17 January. 2020

Amsterdam, Netherlands

COURSE REFERENCE

DRPT255

COURSE DURATION

5 Days

DISCIPLINE

Drilling, Reservoir & Petroleum Training

COURSE INTRODUCTION

Discussion on entire gamut of various artificial lift techniques deployed in onshore as well as offshore oil fields for optimum exploitation of hydrocarbons. Each mode of lift would be discussed in details about its designing criteria, selection, equipment description, techniques for the installation, their operations and trouble shooting.

COURSE OBJECTIVE

The participants would be made adequately aware about the technology inherent in each mode of artificial lift and they would be made fully conversant with their operational details. The working executives would be encouraged to get that doubts clarified during the course period. Adequate value would be added to each participant and their performance would enhance when they go their jobs in oil fields.

COURSE AUDIENCE

The course has been designed in such a way that participants either working in oil field or new entrants would get adequate benefits. Executives already on job would refresh their memory and add new technology to their knowledge. It is therefore suggested that every oil field worker / Executive having basic knowledge of oil industries will derive immense knowledge and confidence after attending the course. This would enable the freshers to work with these units in the fields with total confidence.

COURSE CONTENT

Day 1:

- Introduction to Oil and Gas industry
 1. Overall scenario of oil & gas industries, Part – 1 & Part- 2.
 2. Nodal analysis

Part – 2 :

- Inflow performance relationship (IPR)
- Multiphase flow
- Fluid flow through rocks.
- Darcy's equation
- Petrophysical properties of rocks.
- Productivity index - PI
- Pressure stabilization
- Pressure drawdown.
- Evolution of IPR curve.
- IPR curves for different reservoir drives.
- Change of PI with Cumulative recovery
- Vogel's work of a reference curve
- Standing extension of Vogel's method
- Fetkovich's method for calculating IPR
- Stratified formations
- Conducting inflow performance test.
- Flow efficiency & Skin effect
- Bean performance
- Tubing intake curves
- Integrating the IPR, TIC & Bean performance
- Ros's formula
- Achong's correlation
- Conclusion & recommendations

Day : 2

Part – 1 :

- Introduction to Artificial lift – Why Artificial lift ?
- Different modes of Artificial lift
- Selection criteria for different modes of artificial lifts.
- What is gas lift ?
- Types of Gas lift
- Understanding gas lift
- Design criteria of gas lift
- Operating design of continuous gas lift.

Part – 2

- Operating design of intermittent gas lift
- Operating design of plunger lift
- Operating design of micronic tubing with chamber lift
- Equipment selection
- Installation of Gas lift
- Two pen recording
- Trouble shooting
- Maintenance of gas lift installation

Day – 3 :

Sucker rod pumps (SRP) , (PCP)and ESP

- 1- Introduction to Sucker rod pumps (SRP)
- Surface equipment
- Prime movers Electric motor
- Internal combustion engines
- Devices to protect oil field motors
- Gear reducer
- Pumping unit Conventional crank balance units Beam – Balance units.
- Air Balance units.
- Pumping units API designations.
- Sub Surface equipment's
- Sucker rods Steel sucker rods
- Fiber glass sucker rods
- Continuous sucker rods
- Sub surface pumps Tubing pumps Rod pumps Working barrel Standing valve Traveling valves Plungers
- API pump classification
- Standard designation for a complete pump
- Pump displacement requirements

- Stroke efficiency
- An actual example for class work
- Pump sizing
- Plunger sizing
- Stroke length
- Pump speed
- Rod string design
- Materials
- Rod stress calculations
- Tapered rod strings
- Rod loads during pumping
- API system design procedure
- Dimension less variables
- Design example
- Plunger stroke correlations
- Peak polished rod load correlations
- Minimum Polished rod load correlations
- Selection of counterweights
- Peak torque correlations
- Polished rod horsepower correlations
- Rod stress correlations
- Video film Artificial lift CD/-DVD

Day : 4

Part – 1 :

Polished rod dymemometers

- Mechanical dymometers
- Hydraulic dymometers
- Electronic dymometers
- Dymometers card interpretation
- Rod load versus displacement
- Un anchored tubing
- Anchored tubing
- Testing the standing valve
- Testing the travelling valve
- Measuring the counterbalance effect

System monitoring: Dynagraph Synthetic dynagraph :

Part – 2:

2- An overview of progressive cavity pump (PCP)

- Selection criteria

- Pump Component
- Design of the pump (PCP)
- Operational procedures
- Maintenance care
- Trouble shooting

Day : 5

Part- 1:

3-Electrical submersible pump (ESP)

- Introductions
- Selection criteria
- Pump component
- Design of the pump
- Operational details
- Factors affecting smooth operations
- Troubleshooting

Part- 2:

Hydraulic Jet Pump :

- Introductions
- Selection criteria
- Design of the pump
- Applicability
- Operational details
- Factors affecting operations
- Trouble shooting

Part – 3:

- Group Discussion
- Case History

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

\$6,150 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions

