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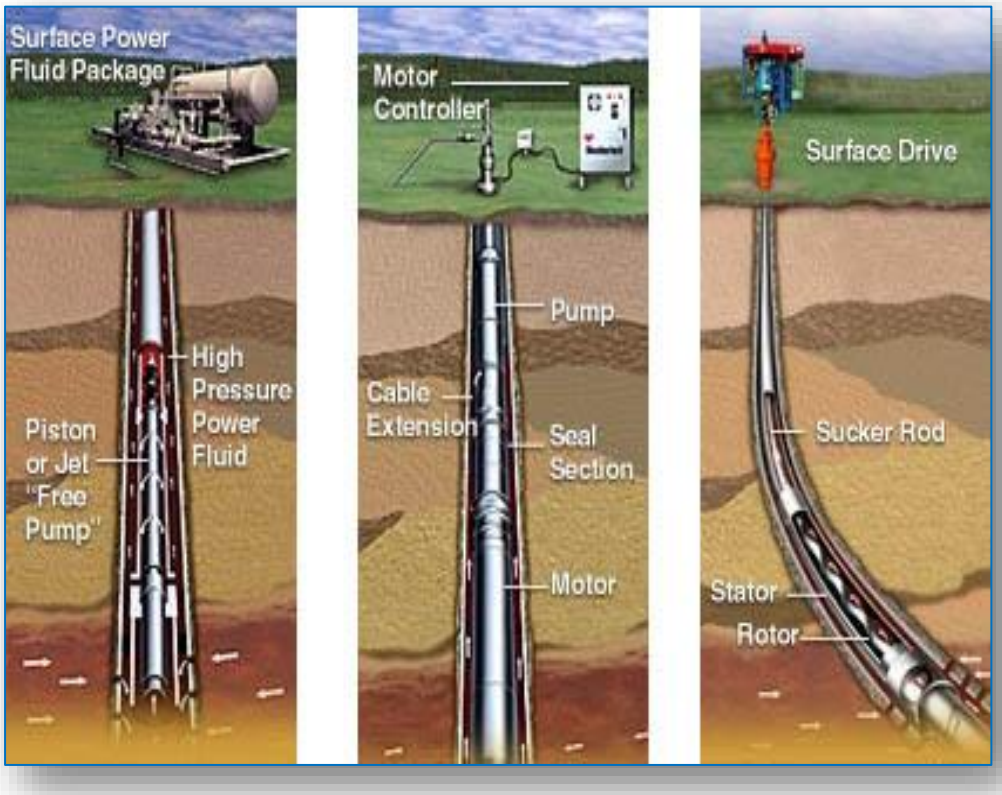
International Centre For Training & Development




# DE143

# Artificial Lift System & Optimization Technology

# Course Introduction:

The course will provide knowledge of Artificial Lift System. Review of fluid properties, multiphase flow regimes and all lifting methods: rod pumps, progressive cavity pumps (PCP), gas lift and electrical submersible pumps (ESP), Discussion of alternate deployments and multi-sensor applications for surveillance and optimization. Strategies and best practices for field production optimization are discussed. The effectiveness for NODAL systems analysis for lifting performance optimization is demonstrated. Five-day course format with presentations, discussions and hands-on exercises.

# Course Objectives:

**Upon successful completion of this course, the delegates will be able to:**

- ✓ Recognize the needs for artificial lift
- ✓ Know all the used artificial lift systems worldwide
- ✓ How to select the best system for each condition
- ✓ All system components
- ✓ Systems best applications, advantages and disadvantages
- ✓ How to design A/L systems
- ✓ Artificial lift systems completion selection and design
- ✓ Systems Performance evaluation
- ✓ Main problems and troubleshooting
- ✓ System economics and running life
- ✓ Use principles and content mentioned below to focus on maximizing oil production with artificial lift systems
- ✓ Make basic PVT properties and inflow performance calculations related to artificial lift
- ✓ Understand and apply multiphase tubing and pipe flow principles
- ✓ Select the appropriate artificial lift system
- ✓ Compare systems to determine which one is most economically feasible
- ✓ Specify components and auxiliary equipment needed for each system
- ✓ Know what best practices are available to extend the life of equipment and installed lift systems
- ✓ Apply basic design and analysis concepts
- ✓ Design system features that allow for gassy production, production with solids, viscous production, and for other harsh environments

# Who Should Attend?

This course is intended for engineers or geoscientists involved in wells surveillance, maximizing recovery or identifying production problems in artificially lifted wells. Technicians, Field Supervisors and others who select, design, install, evaluate, or operate artificial lift systems.

# Course Outline:

***Day 1:***

**GENERAL OVERVIEW**

- Well Inflow Performance relationship (IPR)
- Basic PVT properties
- Artificial lift theory and application
- Artificial lift market
- Artificial lift systems selection
- Components and equipment needed for each system
- Artificial lift well completion
- Fluid Flow Fundamentals
- Black Oil PVT
- Inflow Performance Relationships
- Nodal Analysis Technology

***Day 2:***

- Overview of Artificial Lift
- Comparison of Artificial Lift Systems
- Artificial Lift Analysis Using Measured Data
- Artificial Lift Selection

***Day 3:***

**BEAM (ROD) PUMP SYSTEMS**

- Surface and Subsurface Equipment
- Power Requirements
- Dynamometers and Troubleshooting
- Optimization
- Exercise for Designing a SRP System

**PROGRESSIVE CAVITY PUMPS SYSTEM**

- Applications

- Surface and Subsurface Equipment
- Geometry of Downhole Pump
- Fit (Interference), Viscosity, Slip
- Elastomers
- Power Requirement
- Exercise for Designing a PCP System

***Day 4:***

**ELECTRIC SUBMERSIBLE PUMPS (ESP)**

- Applications, Design and Selection of ESP's
- Surface Equipment
- Subsurface Equipment
- Installation and Operations
- Exercise

***Day 5:***

**GAS LIFT SYSTEMS**

- Principles of Gas Lift
- Gas Lift Valves
- Design and Operations
- Intermittent vs. Continuous Systems
- Exercise

# Course Certificate:



**International Center for Training & Development** (**ICTD**) will award an internationally recognized certificate(s) for each delegate on completion of training.

# Course Methodology:

**A variety of methodologies will be used during the course that includes:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionaires
- Group Work

- Discussion
- Presentation

## Course Fees:

**To be advised as per the course location.** This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

**Daily Course Timings:**

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|---|---|
| 08:00 - 08:20 | Morning Coffee / Tea |
| 08:20 - 10:00 | First Session |
| 10:00 - 10:20 | Coffee / Tea / Snacks |
| 10:20 - 12:20 | Second Session |
| 12:20 - 13:30 | Lunch Break & Prayer Break |
| 13:30 - 15:00 | Last Session |