

Fundamental of ESP Operation



Table of Contents:

- Introduction
- Learning objectives
- Intended audience
- Course Outline



1st floor, Incubator Building, Masdar
City, Abu Dhabi, UAE



00971-2-6452630



00971-50-6652671



info@btsconsultant.com



www.btsconsultant.com

Introduction:

With ESP becoming the artificial lift system of choice in many fields around the world, understanding how they work and how to correctly size and select them is of primary necessity to production engineers.

Although many software systems have been developed to assist us in the process of selecting an ESP system, their use may sometimes lead us to forget the basics and essentials of how ESP operate.


This course intends to show attendants the basics of ESP, how the different components can be sized and selected with simple tools that include a scientific calculator and a few graphs.

We believe that going to the basics gives engineers the opportunity to understand the rationales behind the existing software tools, and will help them learn about the physical mechanisms that govern the performance of the pumps and their failure mechanisms.

The course also includes the basic elements of applying Risk Analysis tools to selecting and sizing ESP, providing the attendants with the knowledge and rationale behind the uncertain scenarios that they face when estimating ESP systems, and how to use that uncertainties to generate and evaluate real options on selecting the equipment that would add the most value to their business unit.

Intended audience

Production Engineers, Supervisors, and those in charge of fields where ESP are used as an Artificial Lift Method



Learning objectives:


Production Engineers, Supervisors, and those in charge of fields where ESP are used as an Artificial Lift Method

After the course attendants will be able to:

1. Calculate the parameters for the selection of an ESP system using a simple, scientific calculator, and a few graphs
2. Analyze the variables that affect the performance of an ESP
3. Select the ESP and the components for your application
4. Analyze the uncertainty surrounding the selection of an ESP and learn to use Risk Analysis tools to choose the equipment configuration with the highest expected value
5. Establish effective ESP monitoring and operation policies
6. Understand how to develop Real Options scenarios for your ESP systems, and understand the basics for evaluating them

Course Outline:

ESP Design

- ESP system component description
 - ESP design fundamentals
 - ESP design using SubPump and PipeSim
- 



LiftPro

- inflow performance
- data requirements
- equipment sizing
- equipment selection
- factors affecting design

- Artificial lift theory - Nodal analysis
- Traditional ESP optimization
- Optimization theory – use of discharge pressure
- Monitoring – sensors
- Fluid levels and intake pressure
- Trend analysis case studies
- ESP optimization examples
- Diagnostics
- intake and discharge pressure
- intake, discharge pressure and multi-phase flow meter
- intake pressure and multi-phase flow meter



Best Technology Solutions (BTS)

- Class examples
- validate production information
- ESP wear

ESP Operations

- VSD Operation – if simulator available
- Abrasion resistance technology
- High GOR Applications
- Troubleshooting
- Failure analysis - teardowns