

**Training Title**

**ELECTRICAL SUBMERSIBLE PUMPS – ADVANCED ESP DESIGN AND TROUBLE SHOOTING (IADC CERTIFIED)**



**Training Duration**

5 days

6 hours per day

Total 30 hours

REF ID001	Electrical Submersible Pumps – Advanced ESP Design And Trouble Shooting (IADC Certified)	5 Days	19 - 23 July 2020	\$ 4,500	Dubai, UAE
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**Training Fees**

4,500 US\$ per participant for Public Training. Fees Includes Course Materials/ Handouts, Tea/Coffee, refreshments, International Buffet Lunch

**Training Certificate**

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.



IADC Certificate

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

The Electric Submersible Pump System (ESP) is considered an effective and economical means of lifting large volume of fluids from great depths under a variety of well conditions. Over the years, the ESP companies, in conjunction with the major oil companies, have gained considerable experience in producing high viscosity fluids, gassy wells, high temperature wells, etc. With this experience and improved technology, wells that were once considered non-feasible for submersibles are now being pumped economically. This course is designed to provide recommendations for designing ESP systems for special applications including gassy wells, production of fluids with solids, viscous oil, dual completions, Ytool applications, shrouded motors, production through the annular, high temperature and recirculation. Pump curves (Head vs. Flow rate) for several pump speeds are generated in class as an exercise.

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## TRAINING OBJECTIVES

Provide in depth knowledge of the advantages and limitations of the Electric Submersible Pumps used in aggressive environment applications. Participants will learn well optimization and troubleshooting.

## TRAINING METHODOLOGY

A highly interactive combination of lecture and discussion sessions will be managed to maximize the amount and quality of information, knowledge and experience transfer. The sessions will start by raising the most relevant questions, and motivate everybody finding the right answers. The attendants will also be encouraged to raise more of their own questions and to share developing the right answers using their own analysis and experience.

All attendees receive a course manual as a reference.

This interactive training workshop includes the following training methodologies

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

## PRE REQUISITES

Delegates are expected to have relevant knowledge in Electric Submersible Pumps Application Engineering course or field experience using ESPs in order to fully benefit from the specialist training. Any similar basic or awareness training must be attended by delegates.

## LANGUAGE PRE REQUISITES

Please be aware that medium of the course is English. Prospective attendees for whom English is a second or foreign language should have a minimum of Low Intermediate level in all four skill sets (reading, writing, listening and speaking) in order to fully benefit from the awareness courses. We recommend a higher level of English language comprehension for the more technical or specialist courses

## WHO SHOULD ATTEND?

Production Engineers, technologists, people who are involved in Production Optimization. Specifically people who want to gain more knowledge about ESP

## TRAINING OUTCOME

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By end the training participants will have an in depth knowledge of the advantages and limitations of the Electric Submersible Pumps used in aggressive environment applications. Participants will learn well optimization and troubleshooting.

### COURSE OUTLINE

- Introduction to artificial lift and electrical submersible pumping
- Introduction for reservoir and production considerations
- Description of all components of the electrical submersible system starting at the surface to the pump; transformers; controllers/VSD; wellhead; tubing cable; cable guards; motor lead cable; pump; intake/gas separator; equalizer/protector; motor; instrumentation
- Installation considerations and cautions
- Design of an ESP system to fit current and future well conditions
- Operation of a given design
- Analysis of an ESP system using diagnostics from installed instrumentation and using diagnostic computer programs
- Removal of failed equipment
- Controls for ESP systems including variable speed drives
- ESP instrumentation available in the industry
- Failure analysis
- Data keeping
- Maintenance and monitoring

### DAILY OUTLINE

- Day 1

- Review of Reservoir Performance
- Productivity Index – Darcy Exercise
- Vogel Exercise
- Centrifugal Pump Curve Development
- Applications 3.1 Standard 3.1 Non-Standard
- Equipment Selection - Exercise

Day 2

- Affinity Laws & Nodal Analysis 4.1. Exercise
- Amperimetric Charts
- Design of High Gas Application - Exercise

Day 3

- ESP Design for Highly Deviated Wells
- Viscous Fluids and Emulsion Application
- Production of Abrasive Fluids

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Day 4

- New Technologies
- CrossFlow
- ESP – TCP – Ytool
- Hybrid ESP – Gas Lift Application
- Recirculation System

Day 5

- Troubleshooting
- Evaluation of Specific Cases Using Appropriate Software (DesignPro, Prosper, SubPump, etc.)
- Equipment Handling
- Introduction to ESP Failure Analysis

**Note:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**



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