Electrical Submersible Pumps (ESP)

Advantages

- Alternative to any other artificial lift system because of more efficiency
- Very high flowrates achievable
- Surface equipment takes up little space
- Can be used in deviated wells
- Daily monitoring problems reduced to minimum unless the pump breaks down
- Good energy efficiency, advantageous if there is access to an existing cheap power network

Condidate Wells

- Wells with low productivity (low PI)
- High water cut wells
- Wells with multiphase flow(high GOR)
- Wells producing fluids of high viscosity
- High wellhead pressure requirements

HPOGC Capabilities in ESP Projects

A) Data Management (Nominating wells for using ESP)

- **Data Gathering:** Well history, Field History, Pre-run ESP data and Production History
- **Data Analysis:** Inspection, Cleaning, Transforming and Modeling of Data
- **Data Acquisition:** Using special software
- **Data Qualification:** Make sure that data are Reliable, Applicable, Complete and Systemitic

B) Design Criteria

- **Technical Design:** Based on Handy / Software nodal analysis design to Select and design of what should be run in hole including all ESP components (Downhole & Surface), completion string, Wellhead and Surface production facilities

C) Supply / Manufacturing Business Plan

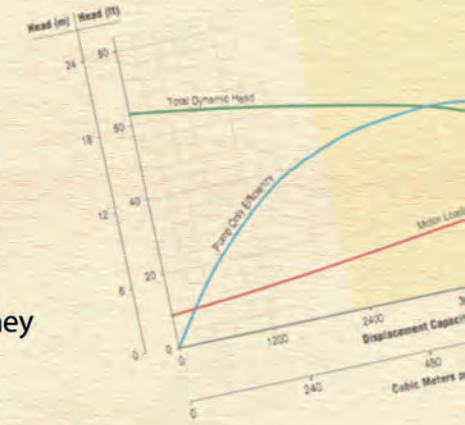
- Procurement Process Planning (technical/commercial clarification of the supplier proposals, Coordinate the procurement and import process)
- Local Manufacturing Process Planning (Generating and transferring the Engineering and Maintenance know-how technology of ESP's as a work shop (DIFA Center)
- Coordination (ITPs, Inspections, Local/foreign Shipments and transportations, Payments Coordination, Customs, storage)

D) Operation & Installation

- Engineering (Preparing well Work-Over programs, Preparing installation procedure)
- Equipment (Prepare and support all installation tools)
- Field Specialist (Supporting with a professional team of field specialist and supervisors)
- Logistic (coordination of tools and engineers transportation to wellsites)

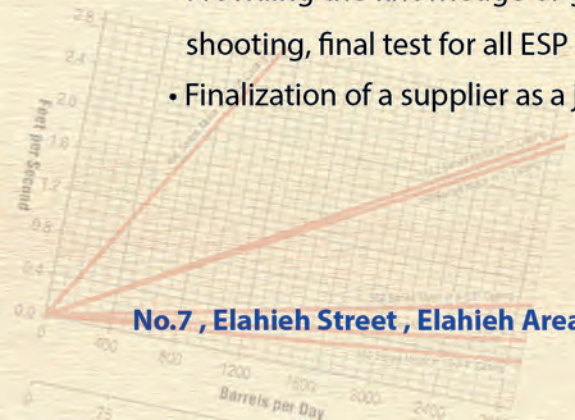
E) Monitoring & Maintenance

- Planning for Startup procedure and flowing the well
- Optimization of ESP working parameters
- Optimization chock sizing
- Human direct supervising of the wells
- Nominate the wells for the next work-over program to save time & money



F) DIFA Center

- Generating a feasibility study of establishing a work shop for to localize the manufacturing, assymbling and testing process of ESP
- Establishing a DIFA center as a MUST for the ESP project
- Providing the knowledge of generate/import the know-how for assembly/dismantling, trouble shooting, final test for all ESP components
- Finalization of a supplier as a joint venture for transferring the technology of DIFA



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