AccessESP Retrievable ESP System

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Case histories for the Live Well Deployment of Retrievable ESP Systems

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What is artificial lift and why use it?

Definition – ***"Artificial lift is a method used to lower the producing bottomhole pressure (BHP) on the formation to obtain a higher production rate from the well." – Petrowiki.spe.org***

Methods

a) GoRigless ESP deployment technology
b) Conventional ESP (Electrical Submersible Pump)
c) Gas Lift
d) Positive-displacement downhole pump – nodding donkeys!

Why?

a) Heavy / viscous fluid
b) Low reservoir pressure
c) Pressure support limited (WAG)
d) Host gas deficient
e) Long step out to wells
f) Increase production in high HC wells

Approx. 2m wells WW using artificial lift

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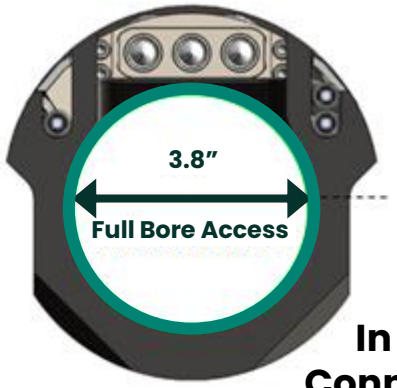
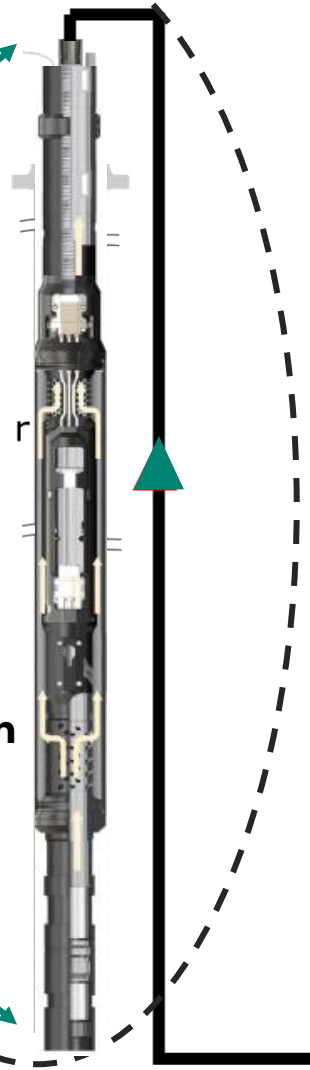
AccessESP Retrievable ESP System

Assembly 1

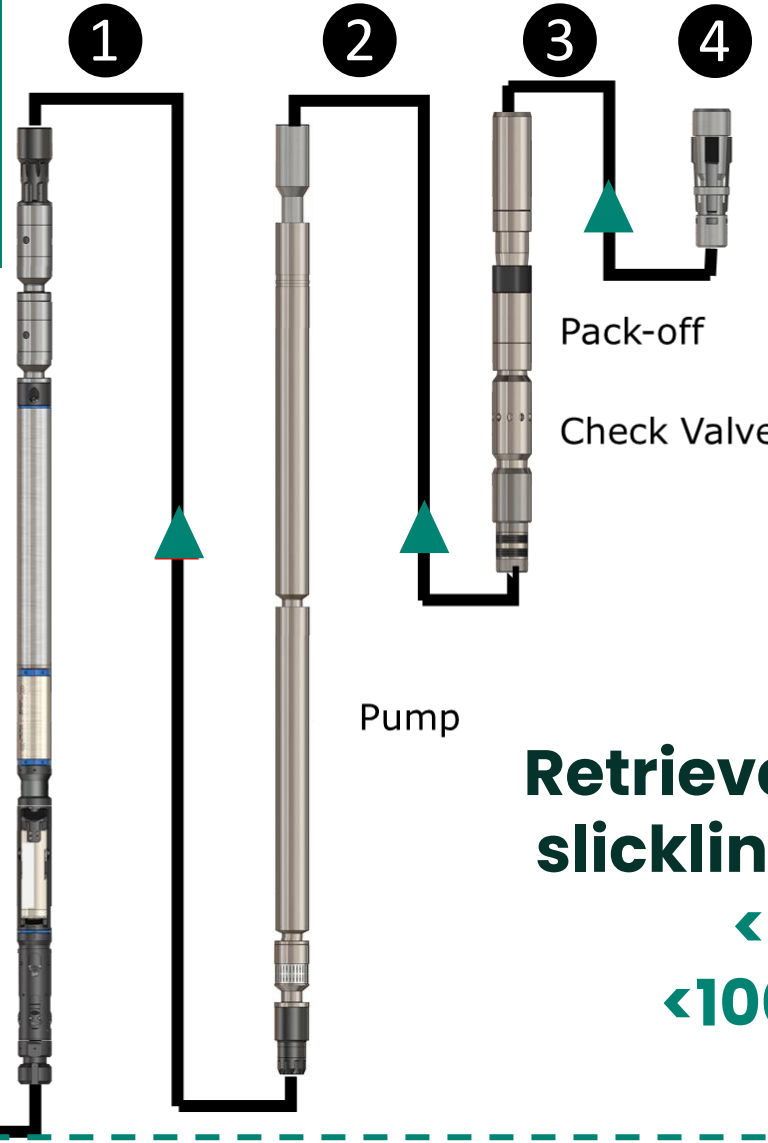
Permanent Assembly



In Line Connection Port



Modular sequence of operation



Assembly 2

Retrievable Assembly

Retrievable on standard slickline with lubricator

‹ 65' length

‹1000lbs weight

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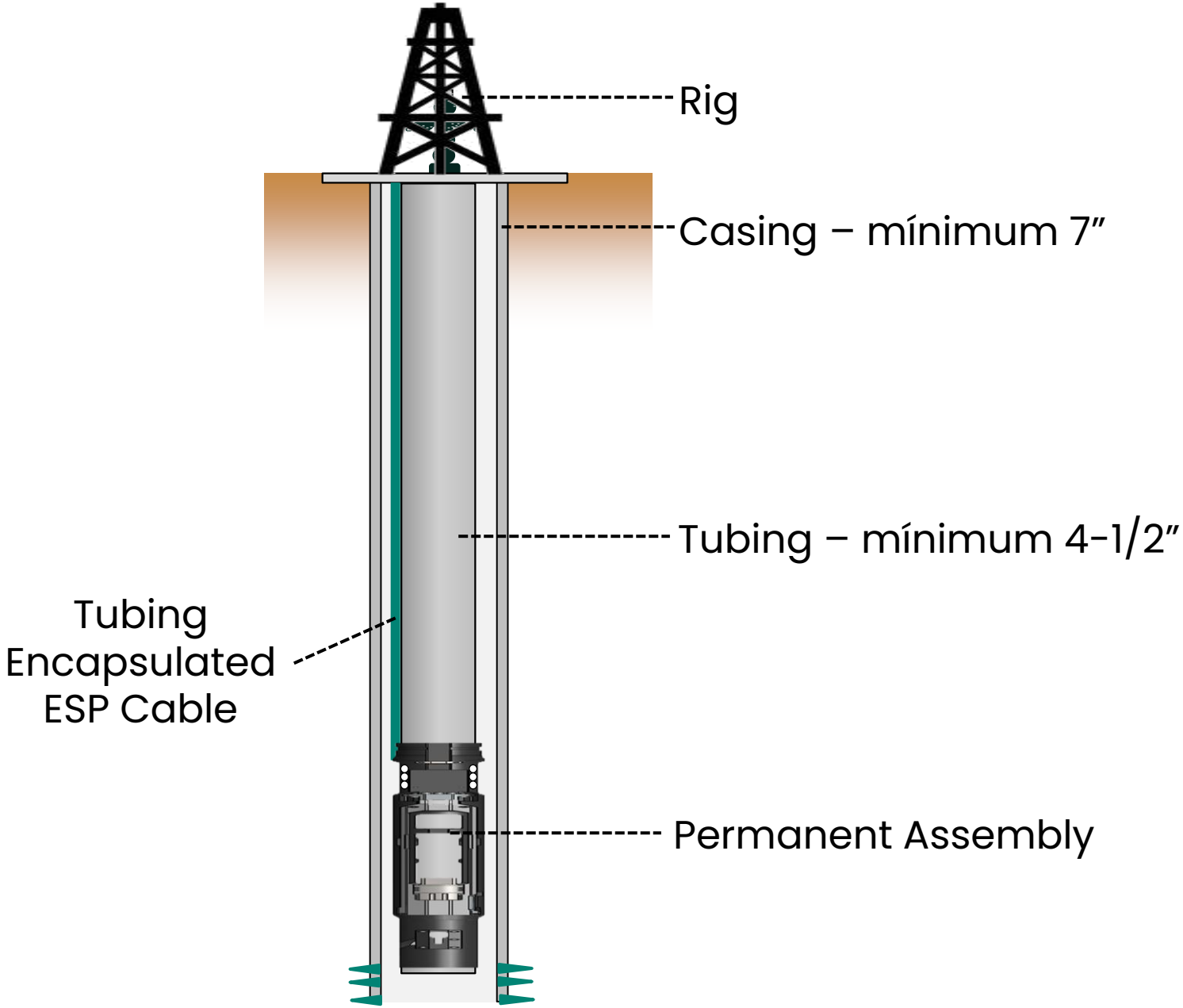
Permanent Assembly installation



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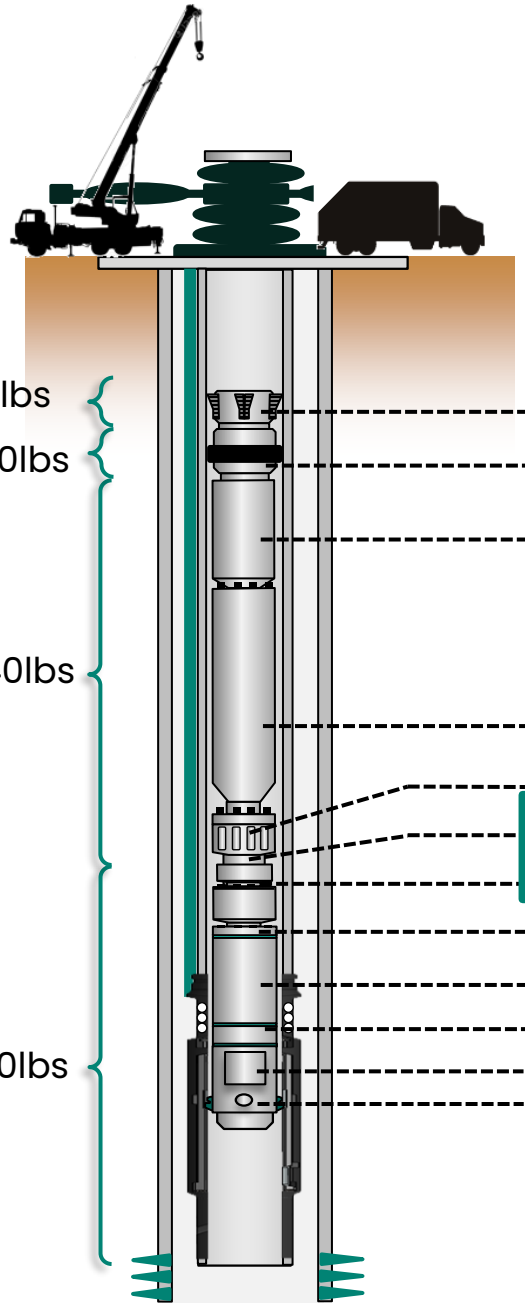
Retrievable Assembly Installation



Upper and Lower Mating Units

Mating units used between each assembly for ease of install / retrieval

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Alaska New Drill Well

Well description for two new slickline retrievable ESP installations:

- 9 5/8 in 40lb/ft casing set to 4600ft MD
- 4 ½ in 12.6lb/ft tubing to ESP depth at 3800ft MD
- Build, hold and build to horizontal directional plan
- **Pump setting inclination 60-65deg**
- **Maximum Dogleg Passed 5.5deg/100ft**
- 3.80in OD ESP pump 35ft long weighing 900lbs
- 130hp PMM 10ft long weighing 200lbs

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Alaska – Operational Phase – Example Well

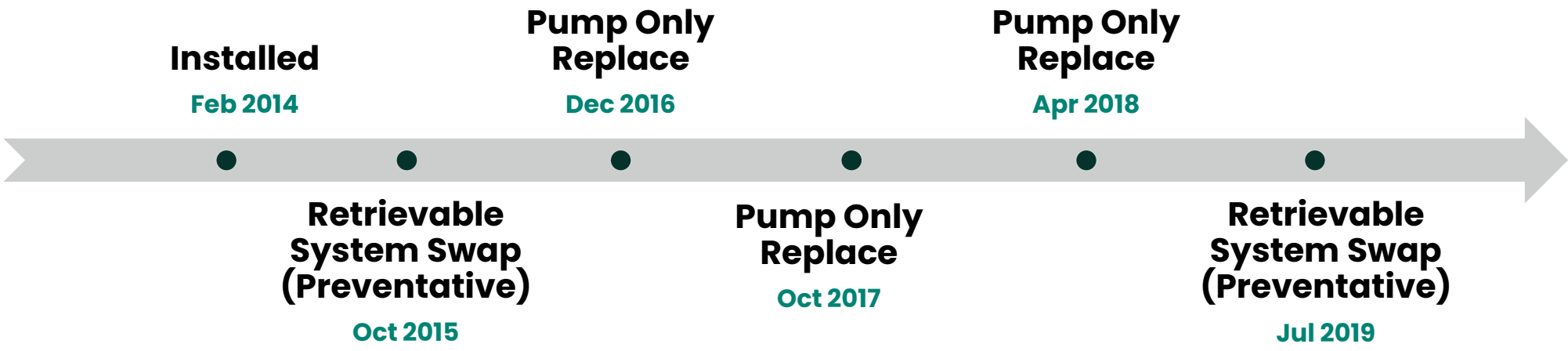
Well History

Challenge: Need to lower intervention costs and well downtime due to sand production causing early pump failure

Result

Six years of operation, two ESP swaps, three pump swaps. All live-well, planned, scheduled workovers (no failures).

SEVEN DAYS TOTAL DOWNTIME (versus over one year with conventional ESP).



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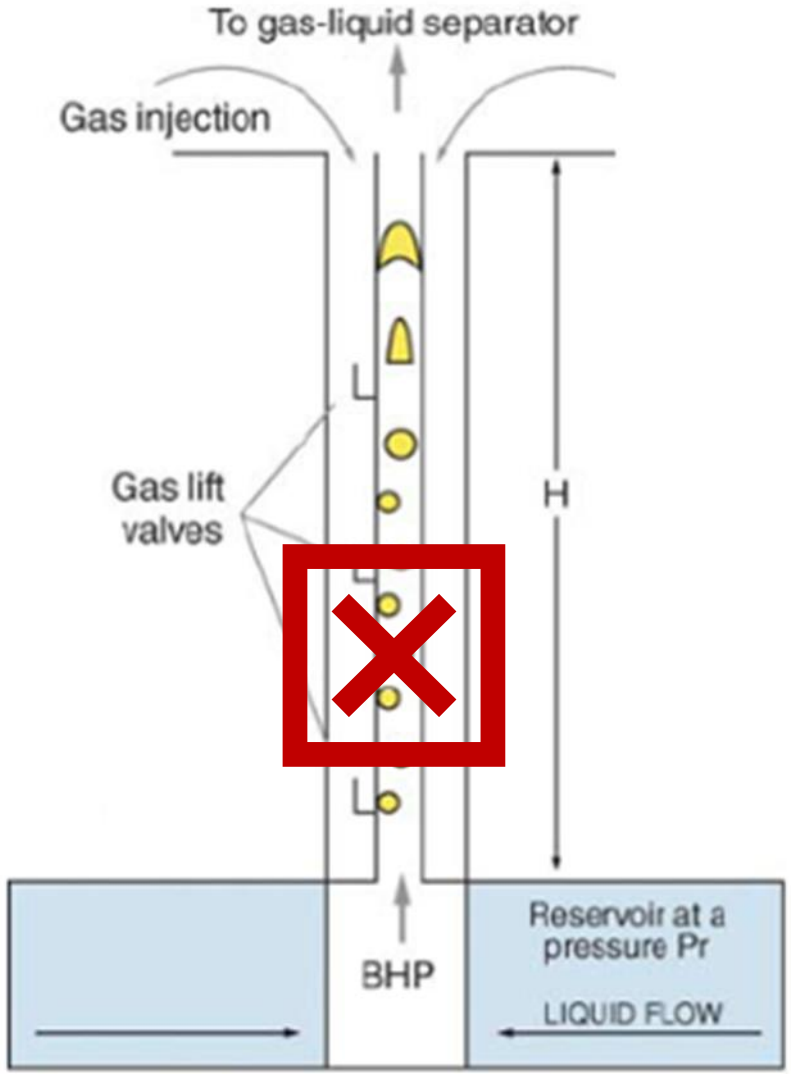
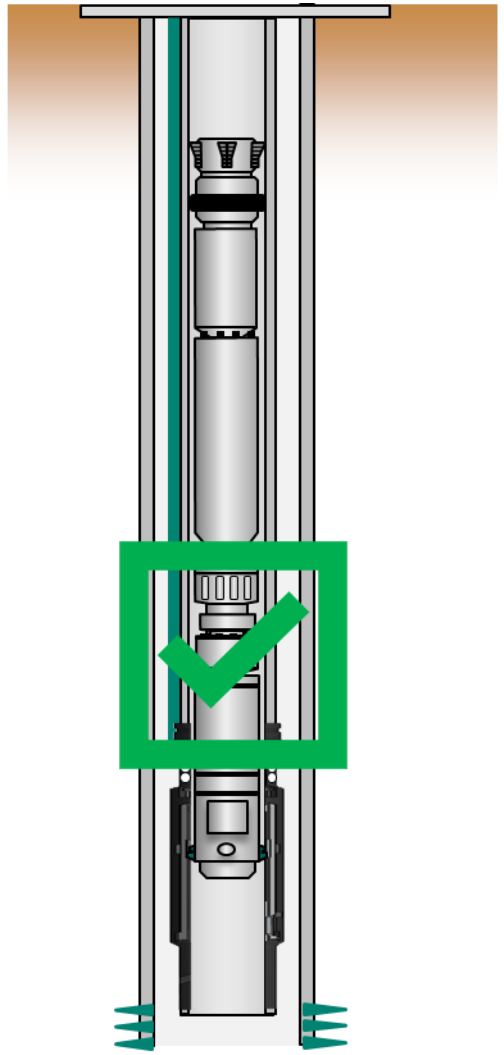


Gas Lift



Retrievable ESP Lift

West Africa Offshore Installation

Description for example well:

- 7 5/8" in 30lb/ft casing set to 4900ft MD
- 4 ½ in 12.6lb/ft tubing to 3484ft with ESP depth at 3494ft MD
- Build and hold directional plan
- Pump setting inclination 20deg
- **Maximum Dogleg Passed 5.1deg/100ft**
- **3.80in OD ESP pump assembly 43ft long weighing 1200lbs**
- 130Hp PMM 10ft long weighing 200lbs

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West Africa Offshore Well

Objective:

- Convert well for gas lift to ESP
- Remove the need for heavy workover

Challenge:

- Increase production of the well to improve economics
- Reduce workover costs to make final well workover viable before P&A

Solution:

Deploy a full bore AccessESP Retrievable ESP System that allows for easy pump and / or motor change out

Result:

- 80% increase in oil production from well compared with GL
- Rapid change out of ESP equipment achieved

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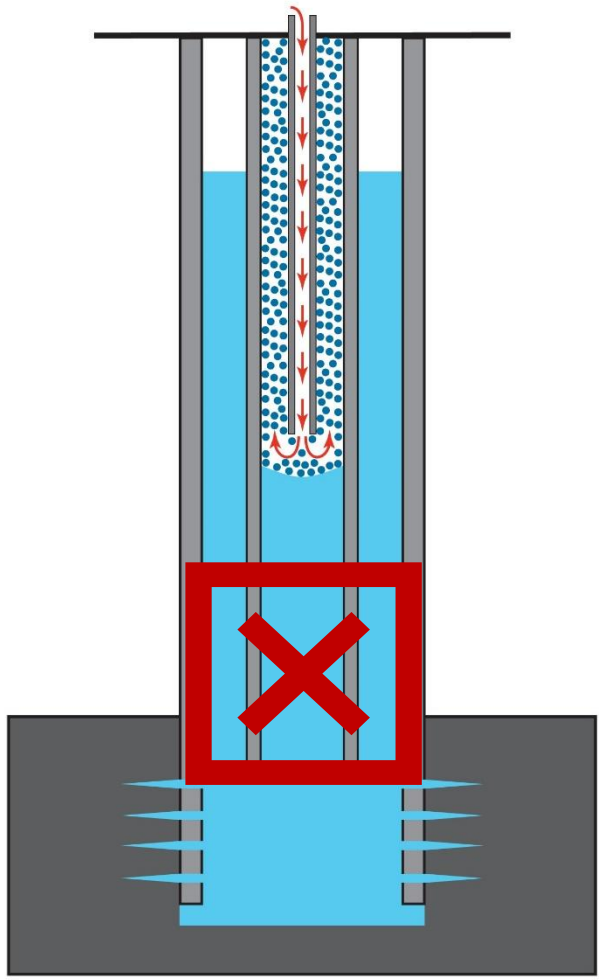
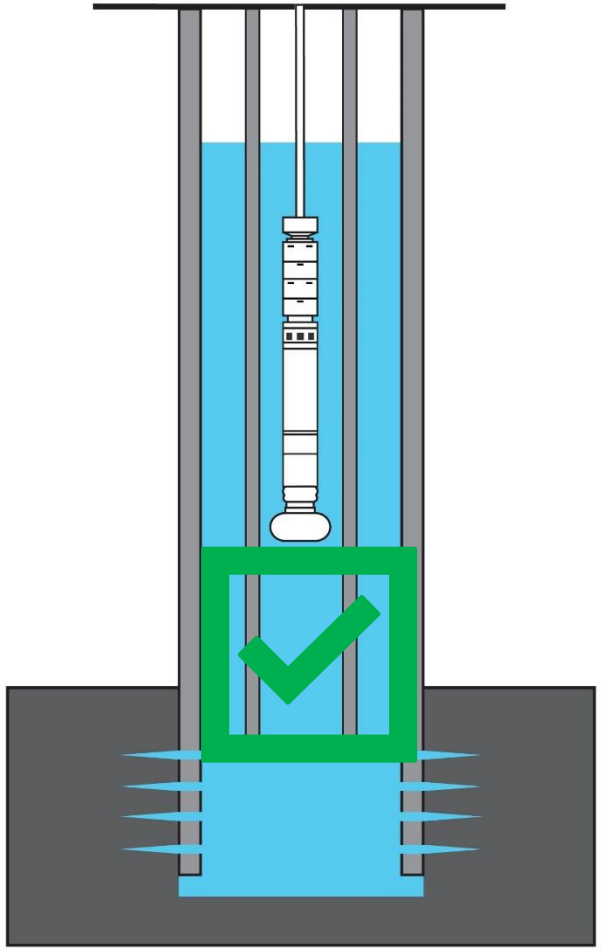


CT N_2 injection



Rigless ESP

Middle East Offshore Flowback Well

Description for example well:

- 9 5/8 in 47lb/ft casing set to 4000ft MD
- Production Packer set at 5000ft MD
- 4 ½ in 12.6lb/ft tubing to ESP depth at 4000ft MD
- Triple Lateral smart lower completion
- **Pump setting inclination 10 deg**
- **3.80in OD ESP pump 57ft long weighing 1100lbs**
- 250hp PMM 16ft long weighing 300lbs

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Middle East Offshore Flowback Well

Objective:

- Deploy an ESP to remove kill fluids without CT or N2 injection
- Allow the option to close zones below the ESP.

Challenge:

- Reduce blowback time
- Achieve fewer operational failures
- Reduced safety risk by eliminating equipment & personnel

Solution:

Deploy a full bore AccessESP Retrievable ESP System that allows 3 ½" shifting tools below to open and close each zone while flowing back with the rigless ESP.

Result:

- Flowback time was reduced by months
- Better utilization of rigs in other critical operations rather than on standby while lifting with N2

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What does ESP retrievability bring?

- The drawdown of an ESP with the retrievability of a gas lift valve
- Changeout of the ESP components through the tubing
- In the A375 size for 4 ½" tubing - production rates up to 6000bpd
- Access to the formation when the ESP components are not installed
- Lower deployment costs when compared to conventional ESP deployment
- Commercially viable technology, proven in a variety of environments globally

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Thank You / Questions

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