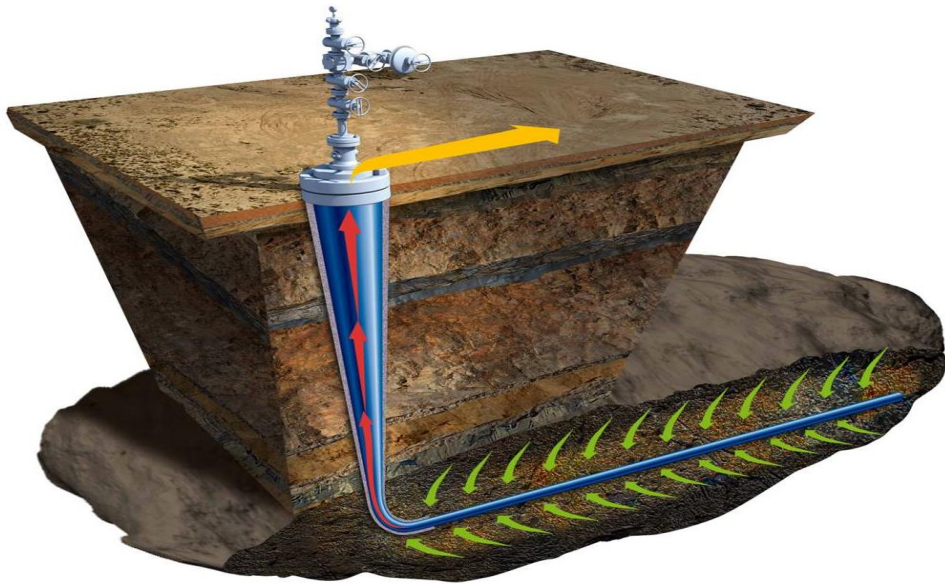


LiftSelect*

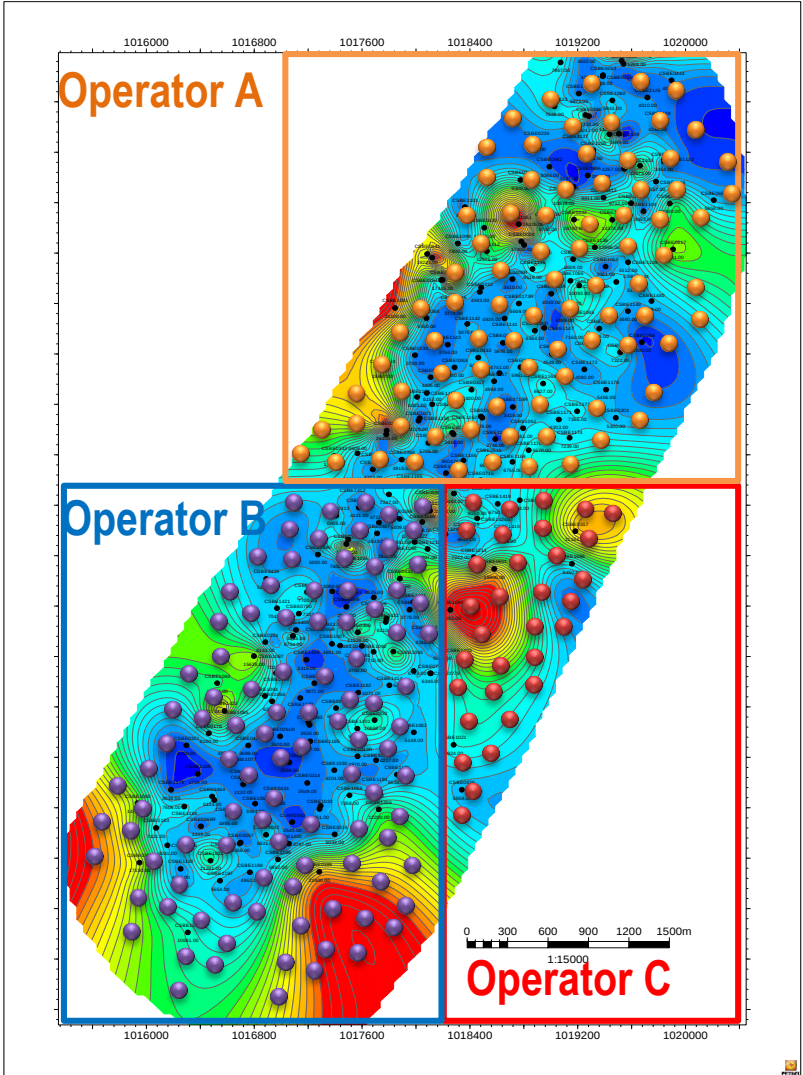
The right artificial lift system, at the right time, every time



Production Group

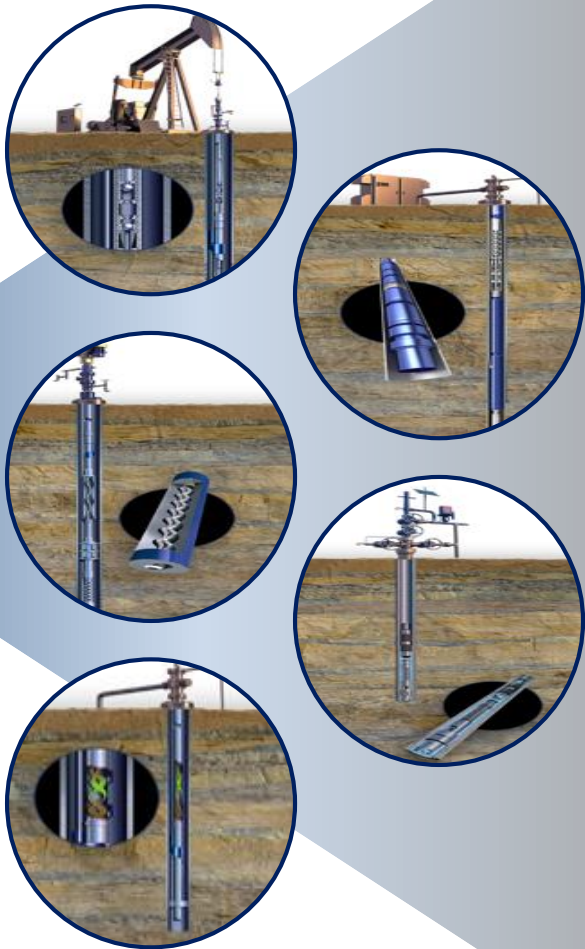
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30,000 ft View of a Reservoir



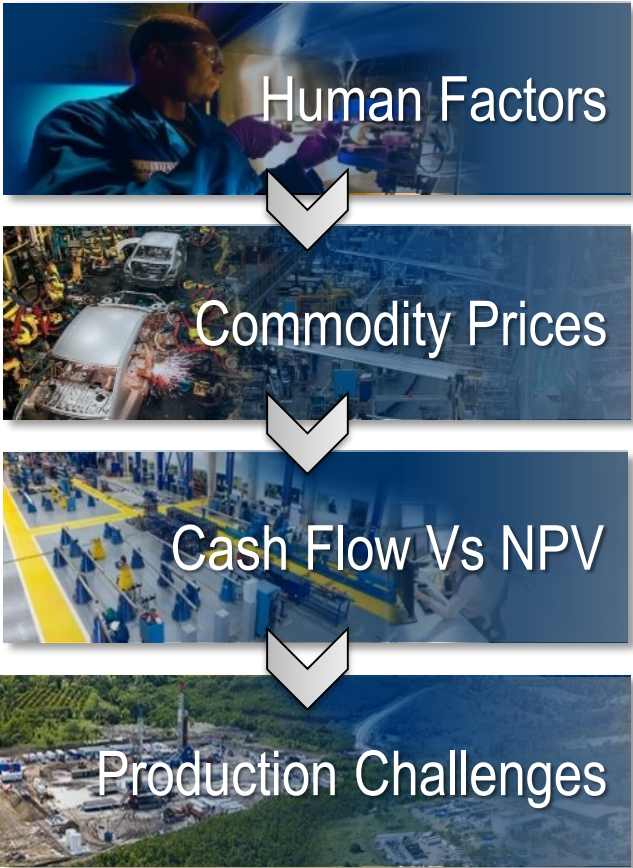
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Every technology works...



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Summary

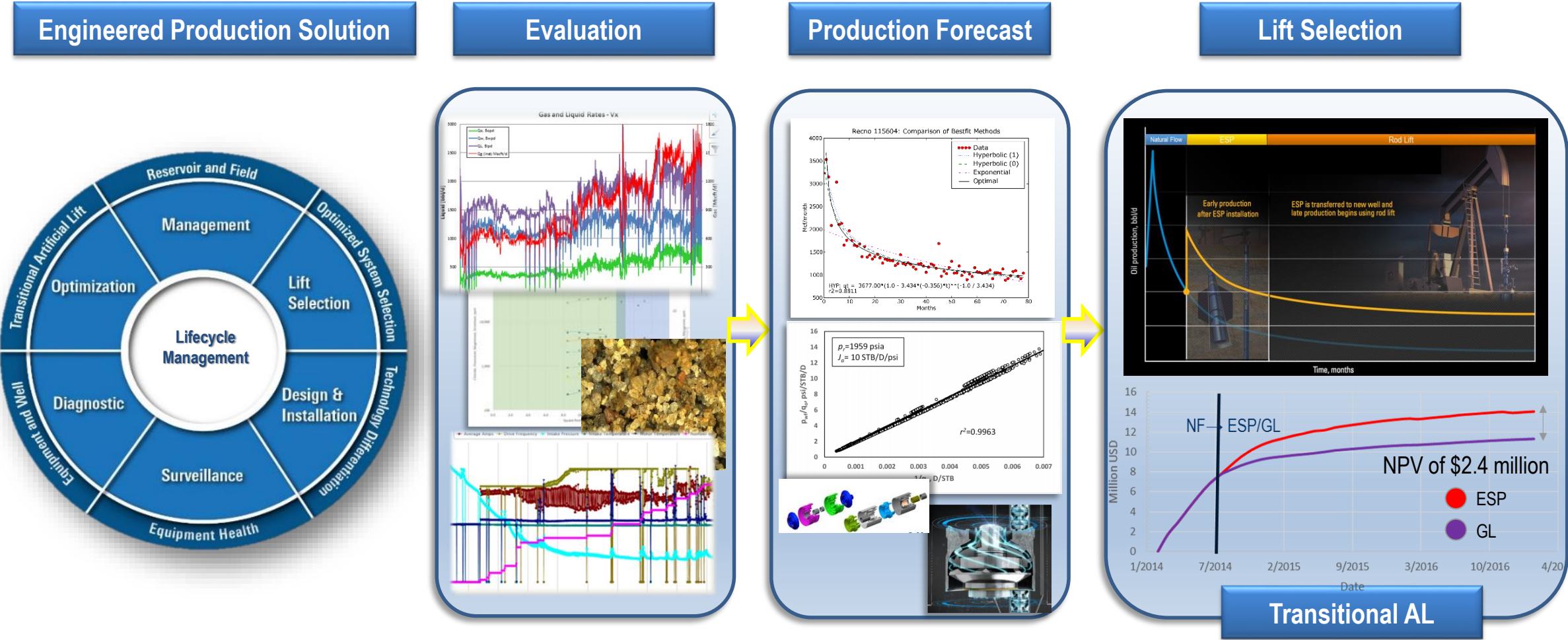


Optimal Artificial Lift Strategy for the Life of the Well

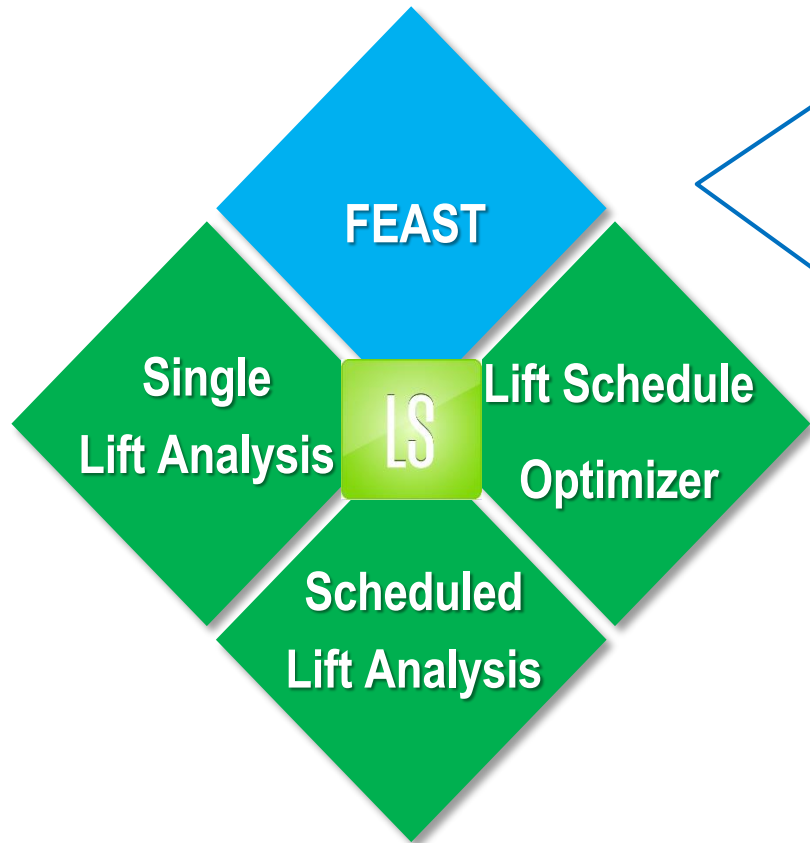


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Artificial Lift Selection for the Life of the Well



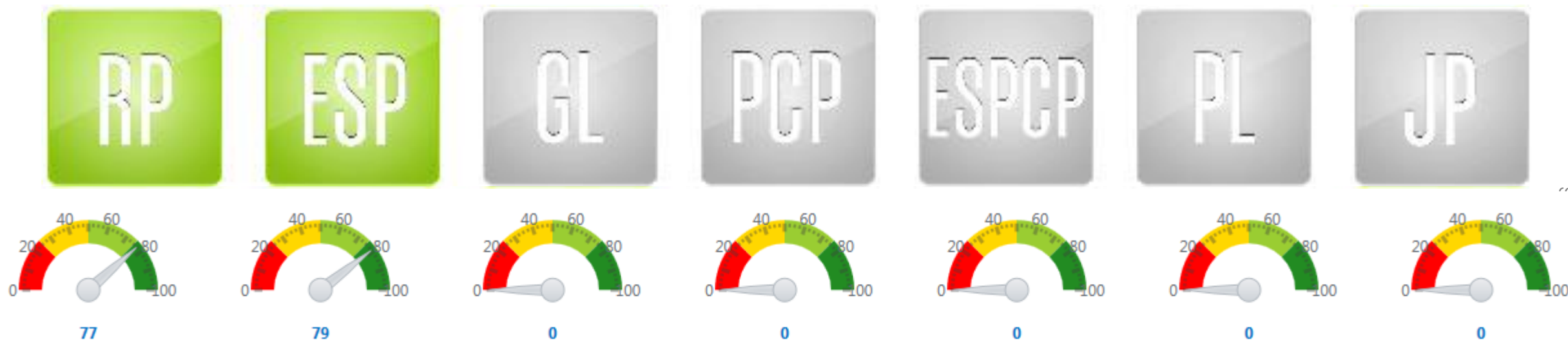
Artificial Lift Selection for the Life of the Well



- Proprietary rule system
- Applicable ALS as per operating conditions
- Exclusion profiles based on technology limitations
- Scoring system based on reservoir productivity and completion design
- Optimized selection for production capacity of Multiphase flow
- Facilities and infrastructure considered



FEAST – Quick Assessment



Exclusion Criteria

- ☐ Offshore
- ☐ High Pressure Gas Source
- ☒ Electrical Source
- ☒ Gas Engine
- ☐ High Pressure Power Fluid

Wellbore Conditions

Casing OD	7 in	Solids	<input type="range" value="10"/>	No
Target Liquid Rate	200 stb/d	Scale	<input type="range" value="10"/>	No
Downhole Temperature	199 degF	Corrosion	<input type="range" value="10"/>	No
API	26 deg	Paraffins and/or Asphaltenes	<input type="range" value="10"/>	
Anticipated Line Pressure	350 psi			

FEAST – Batch Analysis

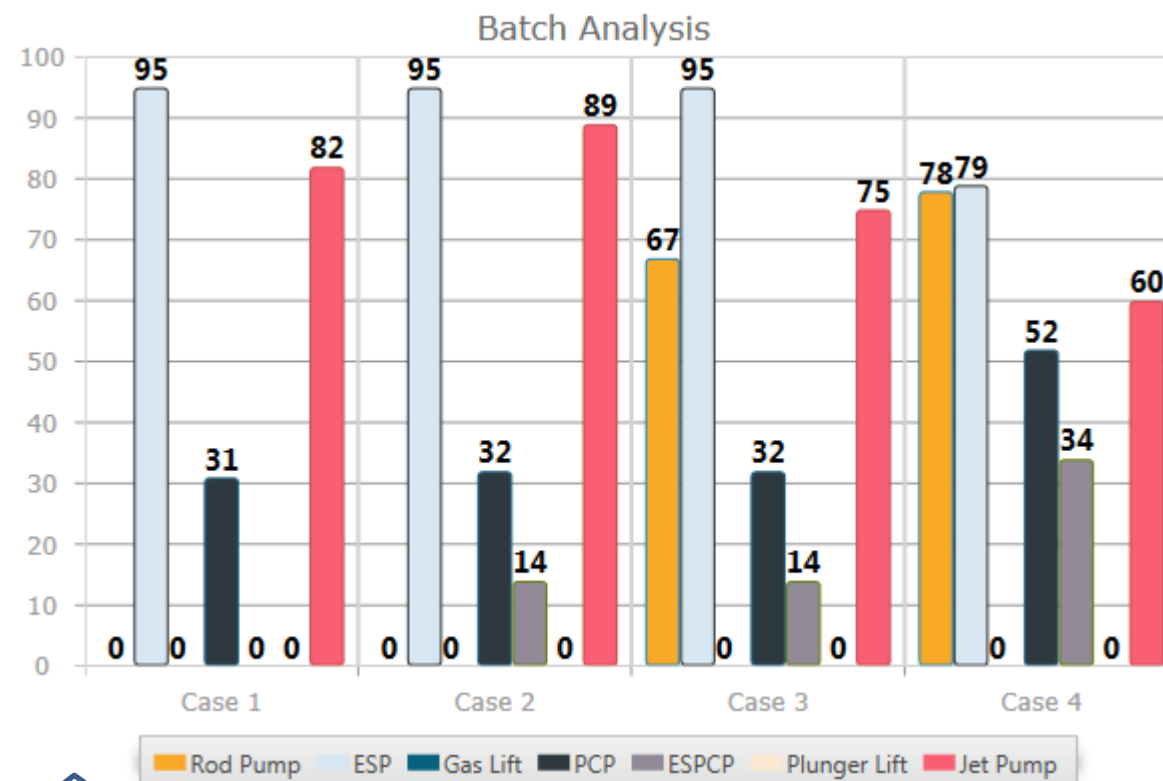
- More than a single tool analysis
- Combination and permutation of different parameters

Batch Analysis Sensitivity Variables

Name	Target Liquid Rate	GLR	API	Downhole Temperature	Solids	Scale	Corrosion	Paraffins and/or Asphaltenes
Case 1	1,500	129	26	220	No ▾	No ▾	No ▾	No ▾
Case 2	1,000	129	26	220	▾	▾	▾	▾
Case 3	500	129	26	220	▾	▾	▾	▾
Case 4	200	129	26	200	▾	▾	▾	▾

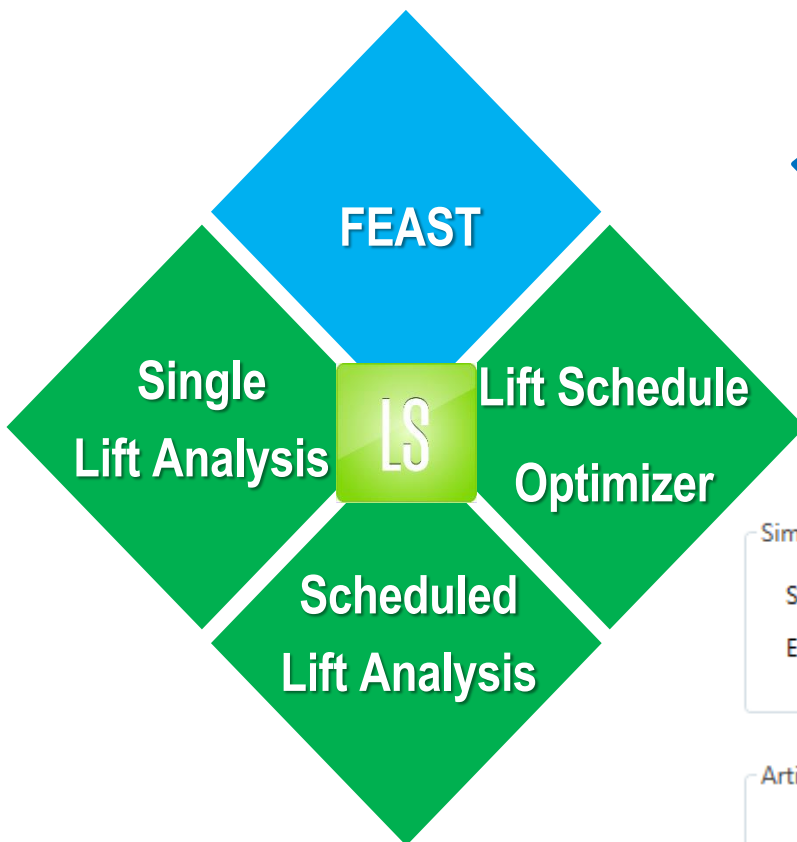
Batch Analysis Output

Name	Rod Pump	ESP	Gas Lift	PCP	ESPCP	Plunger Lift	Jet Pump
Case 1	0.00	95.00	0.00	31.00	0.00	0.00	82.00
Case 2	0.00	95.00	0.00	32.00	14.00	0.00	89.00
Case 3	67.00	95.00	0.00	32.00	14.00	0.00	75.00
Case 4	78.00	79.00	0.00	52.00	34.00	0.00	60.00



- Automated analysis
- Separate inputs
- Separate outputs
- Instantaneous results

Lift Evaluation Workflow



Single Lift Analysis

- Natural flow
- Rod pump
- ESP
- Gas lift
- PC Pump
- Rodless PCP

Simulation

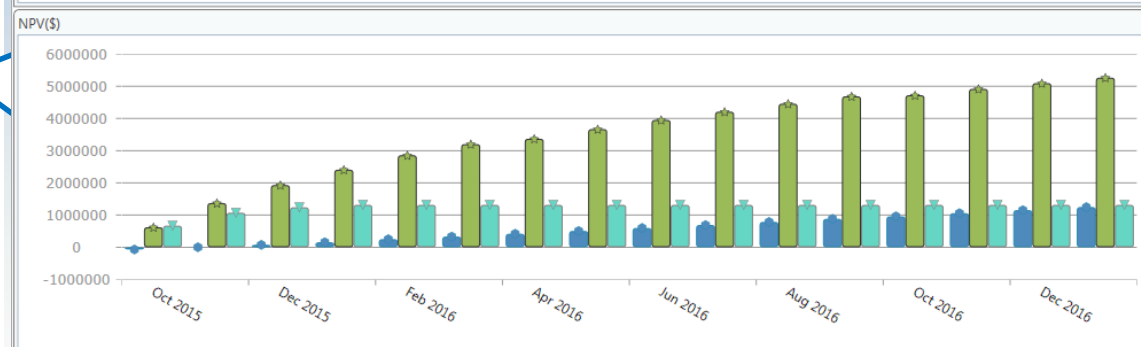
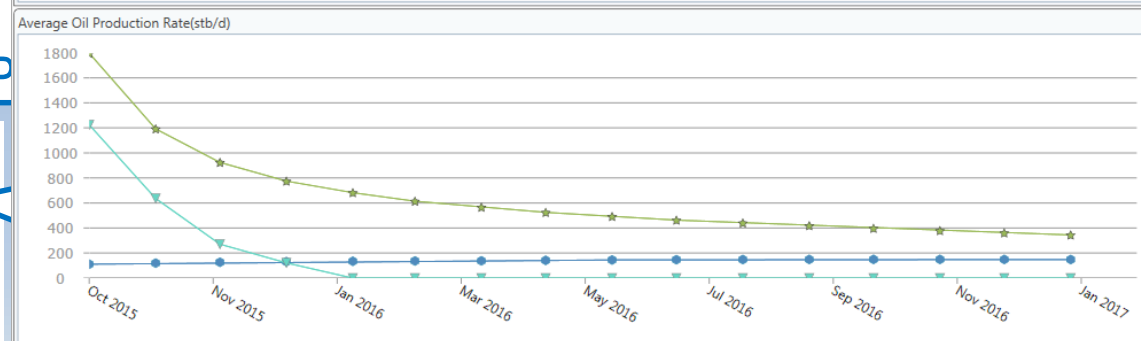
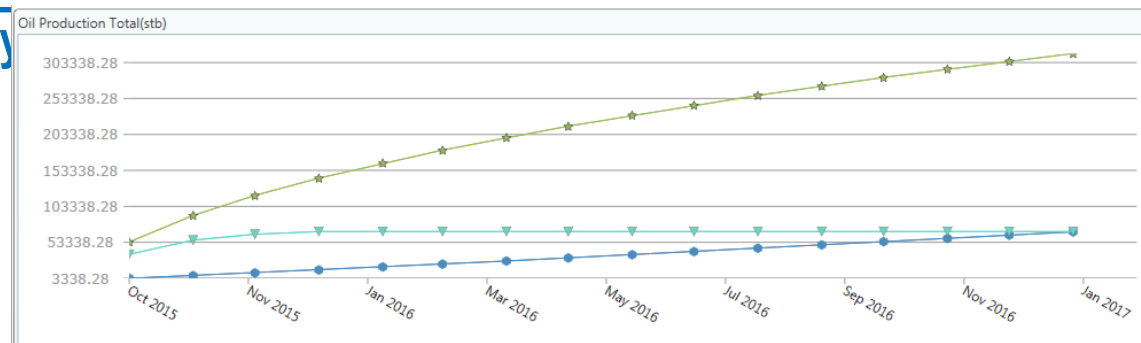
Start Date: 09/01/2015

End Date: 10/01/2017

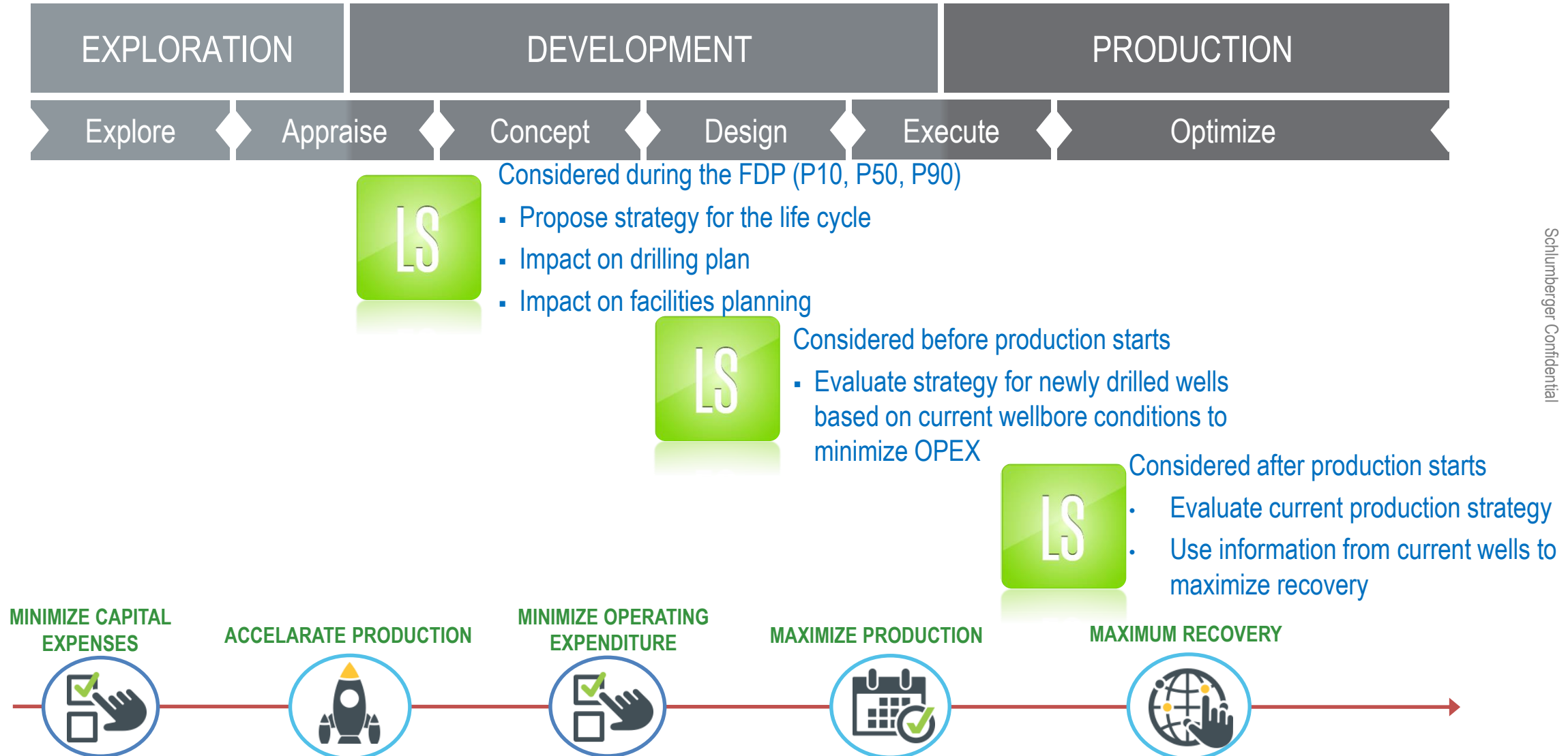
Artificial Lift System

Activate?

- ☒ Natural
- ☐ Rod Pump
- ☐ ESP
- ☒ PCP
- ☒ Gas Lift



LiftSelect in the Life Cycle



Artificial Lift Segment Overview

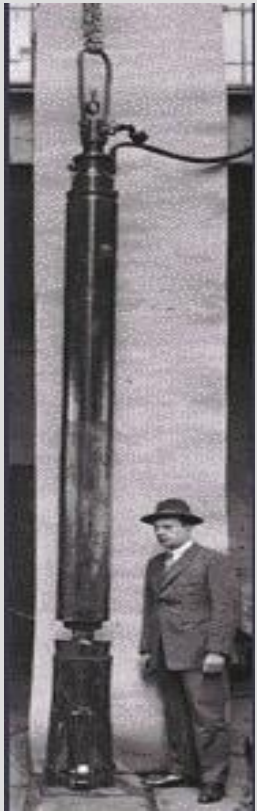


Infrastructure

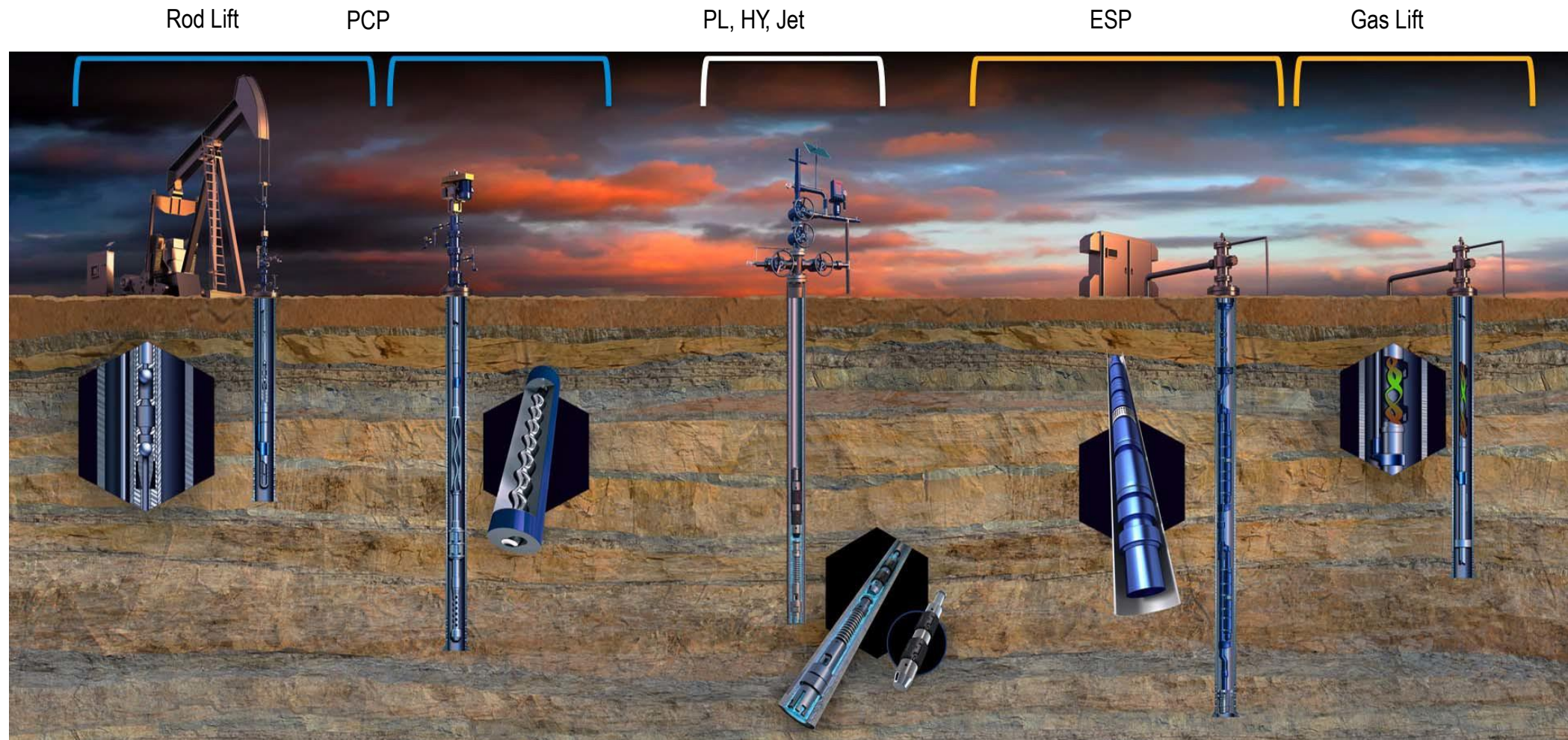
Global Footprint

- 26 Assembly, Repair & Testing Centers
- 5 Technology Centers
- 2 Manufacturing Centers

First ESP manufacturer and inventor in the world. Started in 1927



Artificial Lift Portfolio



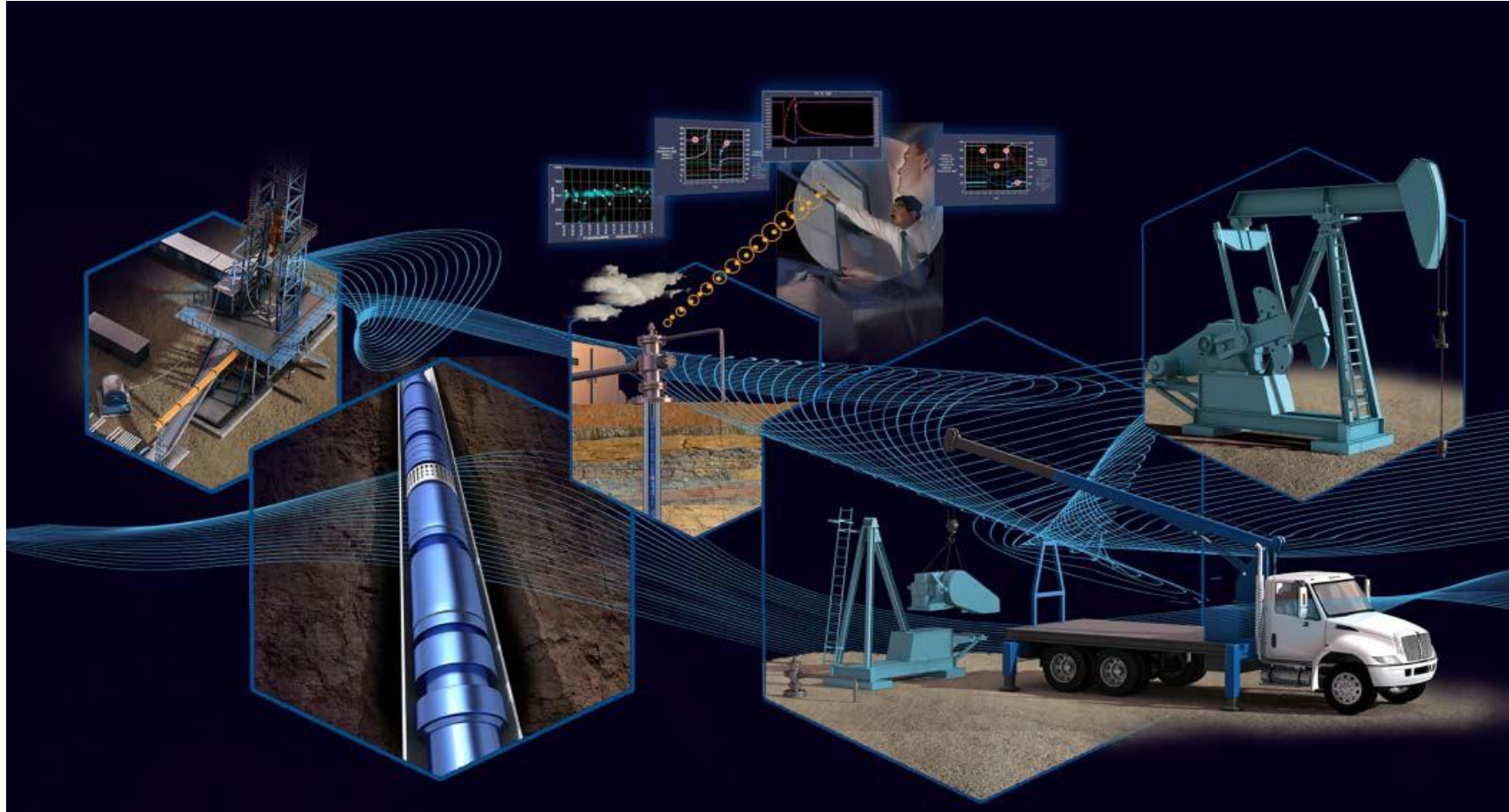
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SYSTEM SELECTION

Operating Condition	Rod Lift	ESP	Gas Lift	Plunger Lift	Progressive Cavity	Hydraulic Piston	Hydraulic Jet
<i>Sand</i>	Fair	Poor	Good	Poor	Good	Fair	Good
<i>Paraffin</i>	Poor	Good	Fair	Fair	Good	Good	Good
<i>High GOR</i>	Fair	Fair	Excellent	Good	Poor	Fair	Fair
<i>Deviated Wellbore</i>	Poor	Fair	Good	Good	Fair	Good	Good
<i>Corrosion</i>	Good	Fair	Fair	Good	Fair	Good	Good
<i>High Volume</i>	Poor	Excellent	Good	Poor	Poor	Good	Excellent
<i>Depth</i>	Fair	Fair	Fair	Fair	Fair	Excellent	Excellent
<i>Scale</i>	Good	Poor	Fair	Good	Good	Fair	Good
<i>Volume/ Flexibility</i>	Fair	Poor	Fair	Good	Good	Excellent	Good
<i>Servicing</i>	Workover or Pulling Rig	Workover or Pulling Rig	Wireline or Workover Rig	Wireline or Reverse Flow	Workover or Pulling Rig	Wireline or Reverse Flow	Wireline or Reverse Flow

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Complete Production Offering



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