Drilling Engineering Solutions (DES)

Akshay Sagar
Business Manager- DD and DES
An Evolving Industry…

1859
Drake Well

1930
Subsurface Prospecting

1949
Hydraulic Fracturing

1970
Deepwater Drilling

1998
Shale Gas (U/C Resources)

2014
DES

Solutions through integration and optimization
What is Drilling Engineering Solutions (DES)?

DELIVERING RELIABILITY
Drilling Engineering Solutions Center (DESC)
DrillingXpert™ - Strength in PSL Collaboration

DrillingXpert™ Software Platform

Sperry's MaxBHA + HDBS's DxD + Baroid's DFG + Landmark's WELLPLAN
Solutions Hierarchy - Customized Engineering

- PRODUCTIVITY
- EFFICIENCY
- RISK

Delivering Reliability

Discrete Products

PSL Design of Service Process

Global Expert Advisor Principal

TA
## DES Solutions Framework

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<th>Well Risk</th>
<th>Advanced Solution</th>
<th>Expert Solution</th>
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<td>Managed Pressure Drilling</td>
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Mexico Case Study: Deepwater

Customer Objective

- Drill a Deepwater “Wildcat” exploration well

Challenge

- Guarantee 100% real-time data acquisition for pore pressure / wellbore stability calculations and reservoir evaluation
- Deliver the directional wellplan through faulted formations with unconsolidated sands and shale layers
- Enlarge the 12 ¼” hole to 20” and 16 ½” and prevent all non-productive time
Mexico Case Study: Deepwater

Solution

- NAV – Drilling Performance
  - BHA design and optimization
  - Remodeled with DrillingXpert™ Software
  - Drilled and enlarged in 1 run

- Shield – Drillstring Integrity
  - Real-time monitoring to prevent tool failures
  - ROP optimization
Mexico Case Study: Deepwater

- Halliburton sets benchmark for building angle
- Achieved double hole enlargement simultaneously
- ROP improvement (65%) setting a new benchmark

Exceeded Objective

16" Section - ROP m/hr - Drilling with double enlargement

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<th>Exploratus 1 West Pegasus</th>
<th>Maximino 1 DLA West Pegasus</th>
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THANK YOU