



CASE STUDY



FlexDrill



Improving ROP and Preserving Bit Life By Automating eDriller Set Point Optimization

WELL PROGRAM STATS

- Brazos County
- Eaglebine formation
- 3 casing string well profile
- Intermediate Bit Size: 7 7/8 in
- Lateral Bit Size: 9 7/8 in
- Average Total Depth: 16,800ft

OBJECTIVE

One operator mobilizing a stacked rig to H&P's South Texas district experienced significant performance improvements with H&P's FlexApps.

FlexDrill™ was used to automate the drilling process and create performance-driven proficiency among the crews, setting the rig up for success. Early-on drilling consistency was established, and time savings were quickly identified across their crews, particularly by increasing their rate of penetration (ROP). The operator batch drilled three wells with FlexDrill and one without FlexDrill to accurately capture the value.

HOW IT WORKS

FlexDrill uses eDriller set point automation to increase the rig's efficiency, reducing the overall mechanical specific energy (MSE), and downhole dysfunctions like whirl and stick slip. FlexDrill also preserves bottom hole assemblies (BHAs) reducing the flat time attributed to tripping out and in the hole to change out bits and tools.

RESULTS

After installation, the operator saw an immediate performance improvement that continued throughout the pad:

ROP Increase

- 5% intermediate section ROP improvement
- 26% lateral section ROP improvement

Faster Drilling

- 22% (0.6-day) average on-bottom rotating drilling time improvement

Lower Cycle Time

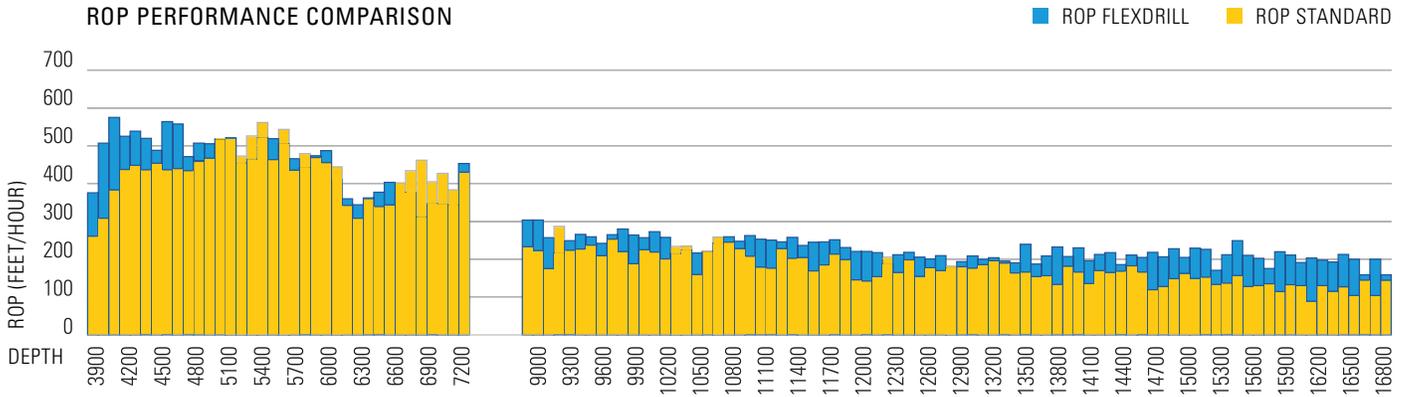
- 12% Spud to TD improvement due to reduction from 13.5 days to 11.9 days

Cost Savings

- \$42,000 average savings at a \$70,000 spread rate



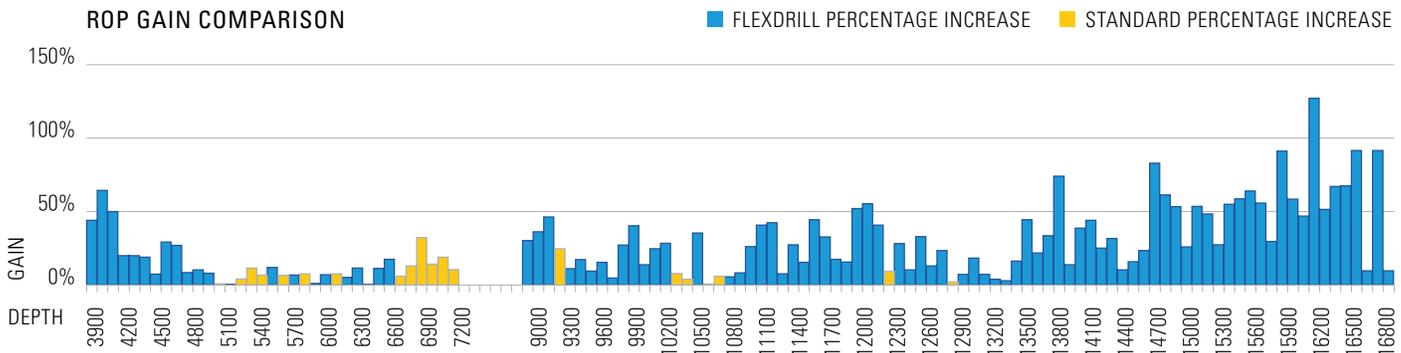
ROP PERFORMANCE COMPARISON



SIGNIFICANT ROP IMPROVEMENTS BY UTILIZING FLEXDRILL. THIS IMPACT STATEMENT IS TRUE FOR BOTH GRAPHS

Comparing average ROP for the three wells drilled with FlexDrill as opposed to the standard well, the FlexDrill wells were drilled an average of 40 feet per hour faster than the standard well at the same depth.

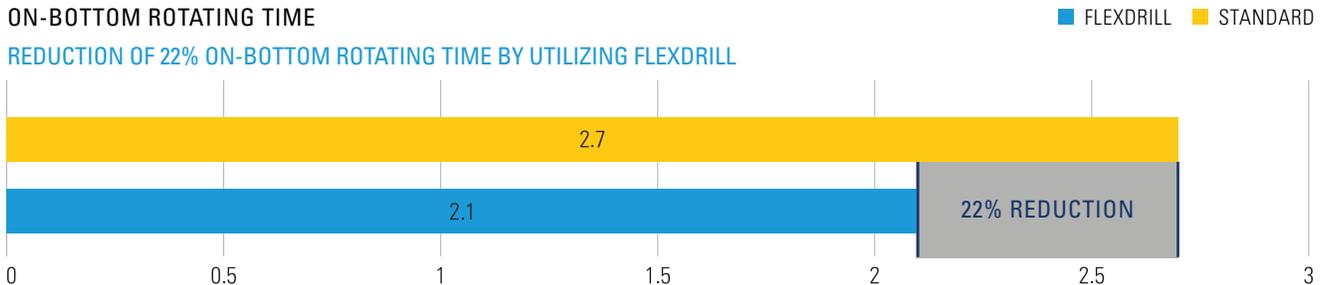
ROP GAIN COMPARISON



This chart shows the frequency at which the FlexDrill well had an increased ROP when compared to the standard well. The frequency of the blue bars indicates a FlexDrill ROP percent increase, which occurred throughout 83% of the total footage drilled. The frequency of the gray bars indicates the standard well's ROP percent increase, which happened during only 17% of the total footage drilled.

ON-BOTTOM ROTATING TIME

REDUCTION OF 22% ON-BOTTOM ROTATING TIME BY UTILIZING FLEXDRILL



* PAST PERFORMANCE IS NOT A GUARANTEE OF FUTURE RESULTS. ANY STATEMENTS REGARDING PAST PERFORMANCE ARE NOT GUARANTEES OF FUTURE PERFORMANCE AND ACTUAL RESULTS MAY DIFFER MATERIALLY.

ABOUT US

We're rated 1st by our customers 11 years in a row because no one designs, fabricates, and operates automated drilling performance packages as well as we do. H&P reduces risk, lowers total cost of operations and accelerates well programs better than anyone. Our long-standing commitment to safety reinforces the importance we place on people and our ability to recruit and retain top talent to serve our customers.