

At-Bit Performance Data Used to Increase ROP and Improve Dynamic Stability, Williston Basin

Synapse service while-drilling data enhances AxeBlade bit durability and performance

Synapse* performance insights and optimization service helps optimize drilling efficiency of 8¾-in ridged diamond element bit through intermediate section in a single run.

Drill section in one run

An operator wanted to optimize bit design for extended durability and better performance while drilling an intermediate section—preferably in a single run.

Schlumberger proposes in-bit tech

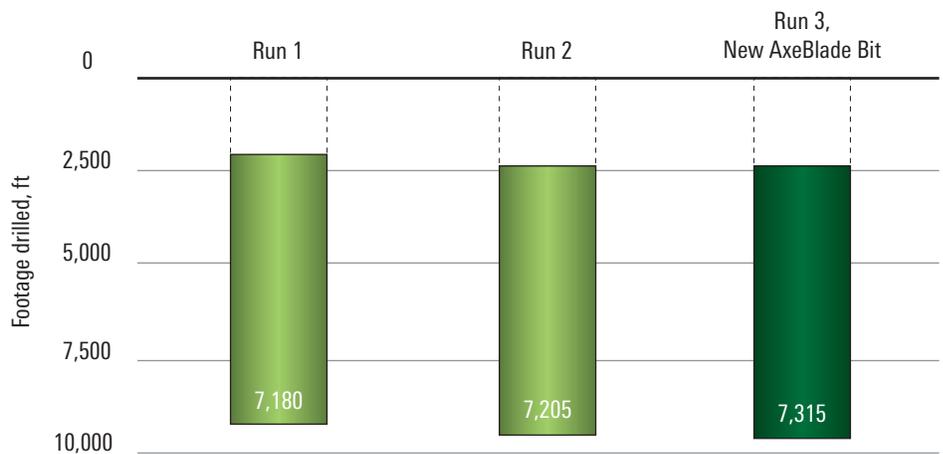
Synapse service is in-the-bit technology that provides postrun data to evaluate drilling system performance by measuring 3-axis acceleration, torsional vibration, and rpm. Data is quickly processed and customized per operator specifications to provide an improved understanding of downhole dynamics and identify performance limiters for future wells.

Paired with an AxeBlade* ridged diamond element bit, this application of Synapse service focused on capturing high-frequency downhole dynamics and vibration data to optimize the bit design, thus improving the bit dull condition and performance. Two deployments were made in two wells drilled with AxeBlade bits. A third deployment would be used to measure the effectiveness of an optimized AxeBlade bit to compare performance, dull grading, and changes to the established drilling parameters road map.

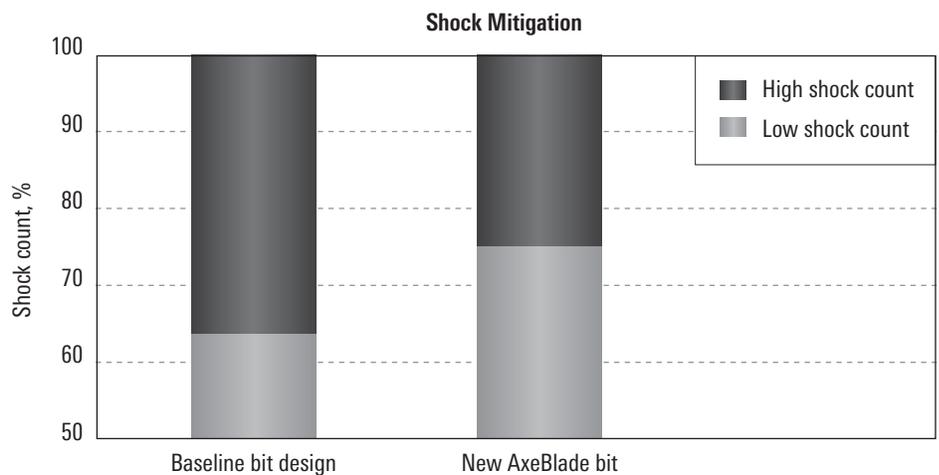
In-bit data enhances section ROP

Downhole and surface data were consolidated to evaluate bit performance, reviewing different vibrations modes and levels and the mechanical energy efficiency. Using this data, Schlumberger generated an optimized drilling parameter road map to help the operator improve its intermediate section performance.

Additionally, Schlumberger used the analysis to customize an AxeBlade bit design, which proved to enhance ROP while drilling more efficiently. The bit solution reduced stick/slip and axial and lateral vibrations, as well as improved mechanical specific energy (MSE) in comparison with all previous runs. Results demonstrate a correlation between improved dynamic stability and footage drilled.



Synapse performance insights and optimization service improved drilling dynamic stability for an AxeBlade bit, resulting in higher ROP.



In-bit data used to optimize the AxeBlade bit reduced high shock and vibration by over 28%.

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