Baker Hughes

CoPilot ultra-high definition downhole drilling dynamics service

Optimize drilling efficiency and run time

The **CoPilot™ ultra-high-definition (UHD) service** measures downhole drilling dynamics in real-time and records ultra-high-definition data to memory during dysfunctional drilling events.

The service acquires downhole measurements in real time including weight on bit, torque, revolutions per minute (RPM), bending moment, bending orientation, tangential acceleration, annular temperature, annular pressure, and bore pressure. When pre-set downhole thresholds are detected, UHD data is automatically recorded to memory using 200 g-rated sensors at 2500 Hz. Recorded UHD data enables post-run analysis of events lasting as brief as 1 ms, a full twenty times greater than the nearest competition.

Placement of the CoPilot UHD sub in the bottomhole assembly (BHA) can be optimized for client-specific applications. It provides useful insight into the effects of downhole drilling mechanics, such as whirl, stick-slip, bit bounce, downhole mechanic specific energy, BHA friction, BHA buckling point, lithology changes, motor wear, spiral hole attitude and severity, local dogleg severity, equivalent circulation density management for hole cleaning and pack-off indications, and continuous azimuthal toolface.

The CoPilot UHD service feeds data to the real-time **SIGNALS™ Optime Drilling Optimization service** to deliver visualization and comprehensive analytics. The SIGNALS team optimizes overall drilling efficiency, reduces nonproductive time (NPT), refines the design of the BHA, and enhances the drilling over the course of a drilling campaign.

Reduce well delivery costs

Dynamic and pressure-related drilling events like as excessive vibrations and whirl, poor weight transfer, unintentional high local doglegs, drill pipe fatigue, twist-offs, lost circulation, excessive circulation, and poor borehole quality can lead to significant unplanned down time. The CoPilot UHD service helps you reduce or eliminate this NPT to drive down well construction cost per foot.

Reduce risk

Dynamic and pressure-related issues can result in target misses, formation damage, unplanned casing strings, or even loss of the wellbore and MWD/LWD

Applications

- Challenging interbedded or complex formations
- Underreaming operations
- Extended-reach wells
- Efficiency gains in unconventional and conventional wells
- In-depth analysis of drilling dysfunctions
- ECD and pore pressure management

Benefits

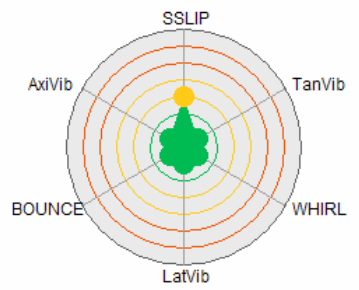
- Reduce operational risks
- Maximize drilling efficiency and performance
- Optimize wellbore placement
- Immediate detection and resolution of downhole drilling dynamics, weight transfer and drilling hydraulics problems
- Capture of UHD downhole data during dysfunctional drilling events

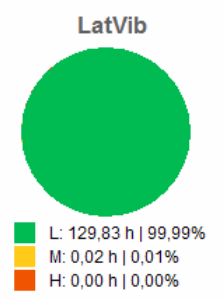
equipment. The CoPilot UHD service protects against lost or deferred production and higher drilling costs.

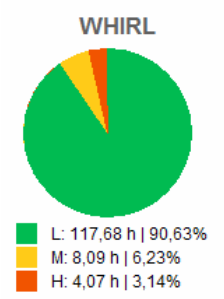
Improve safety margins

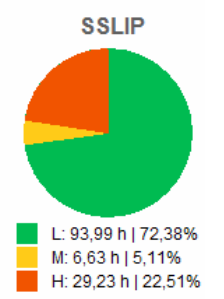
Drilling safely and responsibly is critical to drilling operations. Unforeseen drilling events—twist-offs, tripping for failed equipment, and lost circulation events—have significant safety and environmental implications. Combining CoPilot UHD and SIGNALS Optime services provides the means to quickly identify and prevent these events.

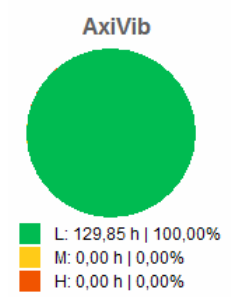
Contact a representative of Baker Hughes, or visit bakerhughes.com to find out how downhole drilling insights from the CoPilot UHD service can help you optimize drilling efficiency and reduce BHA run time.











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