

LOCATION: NORTH SEA

**BAKER  
HUGHES**  
a GE company



# xSight services saved 5 days on the first well in a plug-and-abandonment campaign



A major operator conducting a plug-and-abandonment campaign in the North Sea wanted to reduce the time and costs of section milling operations. NORSOK regulations stipulate that a 165-ft (50-m) window for a cement plug is required for each hydrocarbon zone in the wellbore. Each well in the campaign required milled sections for shallow cement plugs at depths around 5,000 ft (1,524 m) and deep cement plugs at depths from 9,000 to 11,000 ft (2,743 to 3,353 m).

**xSight™ smart intervention services** were implemented throughout section milling operations to help improve efficiency and save time. Improved visibility through real-time downhole monitoring provided better control of torque, weight, vibration, stick/slip, differential pressure, and bend, helping optimize milling parameters.

Monitoring downhole pressure data (differential pressure) and equivalent circulation density (ECD) during section milling operations prevented exposing the formation to high ECD values. These two key parameters also helped avoid debris packoff during the milling operation.

Baker Hughes, a GE company (BHGE), identified whether the packoff was taking place above or below the downhole performance sub by monitoring the measured differential pressures. Other parameters monitored during the milling operation were downhole weight and torque.

Throughout section milling operations, the recorded downhole torque was approximately 30 to 50% of the applied surface torque. The difference in downhole and surface weight followed a similar trend, illustrating a significant difference between

## Results

- Reduced cost and nonproductive time by maximizing section mill life and efficiency
- Lowered risk by monitoring downhole milling parameters and cuttings removal
- Reduced risk of mud loss through close monitoring of ECD
- Improved operations efficiency by providing more time to adjust surface parameters

## Challenges

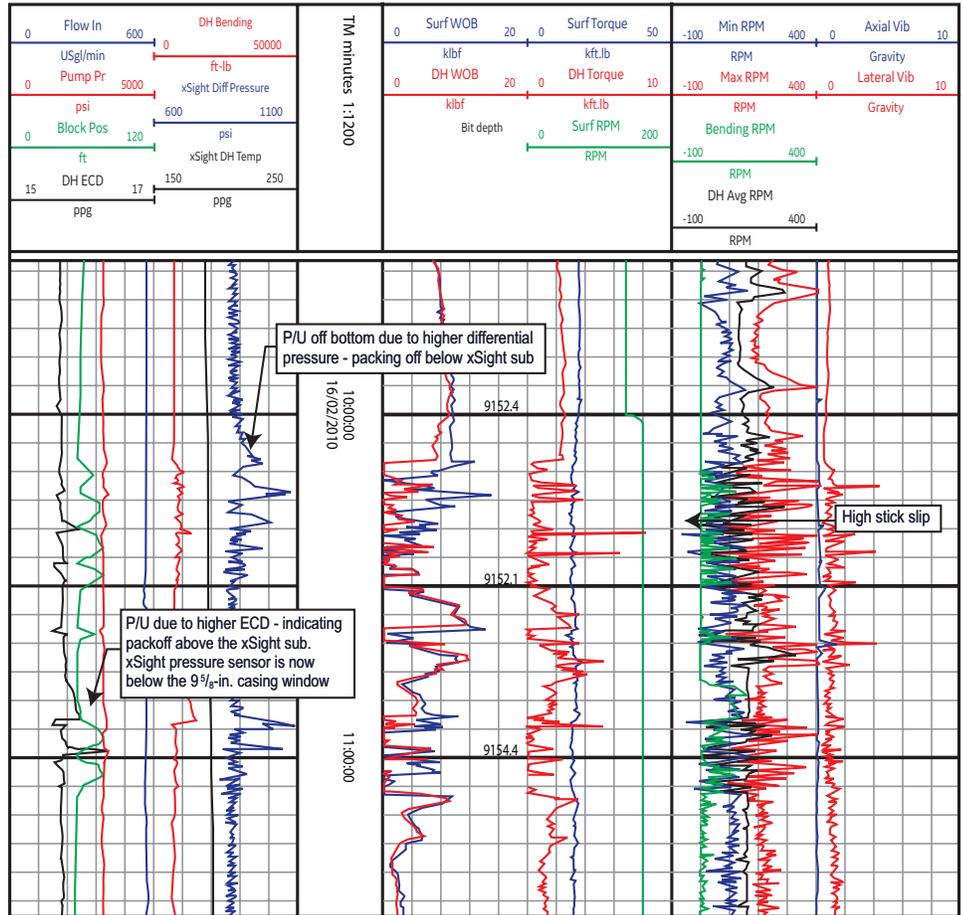
- Increase efficiency in a field-wide plug-and-abandonment campaign
- Mill a deep, 165-ft window, and shallow 330-ft (101-m) window in 9 $\frac{1}{8}$ -in. casing

## BHGE solution

- xSight smart intervention services monitored downhole parameters in real time
- Insights from xSight monitoring provided the optimal parameters and guidelines for subsequent section milling operations in the campaign
- ECD monitoring improved cuttings removal, eliminated debris packoff, and protected the formation

surface measurements and actual downhole conditions. The visibility of actual downhole parameters in real time guided adjustments to reduce vibration, extend cutter life, and maximize cutting efficiency.

xSight smart intervention services helped reduce time on section milling operations, saving almost 5 days of rig time (approximately \$3.2 million USD) on the first well in the campaign alone.



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