UNCONVENTIONALS

CASE STUDY

One-Run Mill-Out Sets Record for Operations in Colombia

SPECTRUM® SENSORS IMPROVE MILLING OPERATION THAT USES NITRIFIED FLUIDS

COLOMBIA

CHALLENGES

- Stay within milling tool torque specifications while milling with a nitrified fluid
- Optimize milling tool efficiency to reduce the number of runs while milling a restriction
- Avoid exceeding coiled tubing string capabilities due to excessive torque

SOLUTION

SPECTRUM® sensor technology, including:

- Torque sensor – to measure actual forces on the BHA while milling
- Internal and external pressure sensors – to evaluate the differential pressure and optimize the milling efficiency of the motor and bit
- GR and CCL sensors – to allow correlation of actual depth of the BHA

RESULTS

- Succeeded in operating under the milling specification of 900 ft/lb
- Accomplished job in a single run, compared to typical three runs
- Enabled real-time decision making by observing downhole changes as they occurred

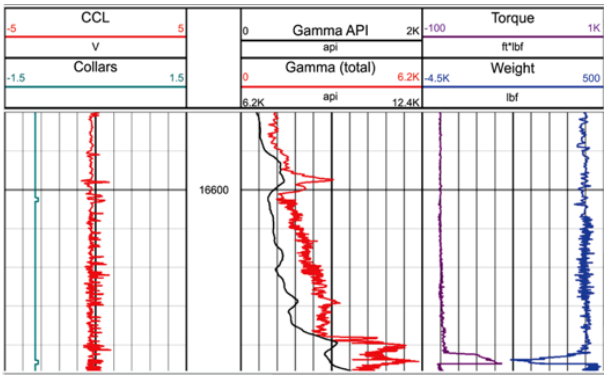
OVERVIEW

A milling operation in Colombia used nitrified fluids to improve the cleanup process following a well's stimulation treatment. This multiphase fluid contained a liquid base and gaseous nitrogen, which made it critical to not exceed the milling tool torque specifications (maximum 900 ft/lb). The operator also wanted to complete the objective in fewer than the usual three runs typically needed to complete a mill-out, while being careful not to exceed the tubing string capabilities due to excessive torque.

HALLIBURTON LEVERAGES SPECTRUM® SENSOR TECHNOLOGY

The use of SPECTRUM® sensors for real-time measurement of torque, internal and external pressure, and gamma ray (GR) and casing collar locator (CCL) sensors, enabled the operator to keep a close watch on downhole parameters and ensure control of milling within strict specifications. Given the nitrified fluid challenges with respect to the milling tool torque restrictions, it was important to be able to observe downhole changes as soon as they happened.

Specifically, the torque sensor measured actual forces on the bottomhole assembly (BHA) while milling; the internal and external pressure sensors evaluated the differential pressure and optimized the milling efficiency of the motor and bit, and the GR and CCL sensors allowed correlation of actual depth of the BHA.



Downhole data supplied by SPECTRUM® sensors

The job was successful in maintaining safe torque levels throughout the milling process, improving efficiency and enabling completion in just one run.

To find out more, please visit: halliburton.com/spectrum

www.halliburton.com

HALLIBURTON