CASE STUDY

StethoScope Service Accurately Measures Fluid Gradients, Depletion in Heterogeneous Reservoir

Real-time formation pressures aid in development planning offshore Malaysia

CHALLENGE
Measure formation pressures in depleted, highly heterogeneous oil and gas reservoir to aid field development planning.

SOLUTION
Use StethoScope* formation pressure-while-drilling (FPWD) service with TOP* time-optimized pretests.

RESULTS
Provided valuable information for field development planning, saved rig time, and reduced risk of hole collapse.

Determine depletion in highly heterogeneous reservoir
An operator drilling four wells in a producing oil and gas field offshore Malaysia wanted to acquire accurate formation pressures in the new wells. The pressures were needed to determine depletion of the highly heterogeneous reservoir and put together a field development plan that would maximize production of the remaining hydrocarbons and minimize water cut. In addition, the operator wanted to avoid making a separate run for pressure measurement because it would require extra rig time and increase the risk of hole collapse by delaying the casing run.

Acquire accurate formation pressure measurements
StethoScope FPWD service enabled the operator to acquire the accurate measurements needed for field development planning without making additional runs. Schlumberger reservoir engineers provided support 24/7, performed data QC, and helped the operator adjust the measurement plan in real time.

TOP time-optimized pretests enabled acquisition of stabilized formation pressure measurements in the highly heterogeneous reservoir at various mobilities. Acquiring the measurements with the mud pumps off reduced noise to enhance accuracy, enabling determination of pressure variations as small as 0.03 psi.

The StethoScope service successfully identified fluid gradients and formation depletion in real time, thereby providing valuable information for field development planning and saving rig time.

The pressure profile from StethoScope service, with fluids typing as well as formation depletions and mobility, indicated the reservoir was highly heterogeneous.
CASE STUDY: StethoScope service provides accurate fluid gradients and depletion information

Provide real-time information for field development planning

The StethoScope service successfully identified fluid gradients and formation depletion in real time, thereby providing valuable information for field development planning and saving rig time. A total of 78 tests taken in four wells acquired five gas gradients, three oil gradients, and one water gradient. Average station time was only 12 min, and the average pressure test time was just 20 min. The service achieved a 100% seal success rate on 48 of the tests and 93% on the other 30.

Contact your local Schlumberger representative to learn more.

TOP pretests allowed acquisition of stabilized formation pressures, regardless of permeability.

- Quartz gauge flowing pressure, psi
- Strain gauge annular pressure, psi
- Pretest volume, cm³

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