



MATURE FIELDS



UNCONVENTIONALS

Petroboscan Obtains Real-Time Formation Pressure Data and Extends Production in a Mature Field

GEOTAP® LWD FORMATION TESTER PERFORMS SUCCESSFULLY IN HEAVY OIL ENVIRONMENT, WITHOUT NPT

BOSCÁN FIELD, VENEZUELA

CHALLENGE

- » Obtain accurate, real-time formation pressure measurements from a mature oil field
- » Mitigate risks of heavy oil environment, and deviated well with inclinations of up to 38°
- » Avoid stuck-pipe, lost tools, etc., keeping non-productive time to a minimum

SOLUTION

- » Use GeoTap® LWD formation tester - to reliably acquire formation pressure measurements in real time
- » Leverage “flow-on” mode, or while circulating, and ability to rotate and circulate the BHA - to prevent stuck pipe
- » Provide Sperry Drilling team expertise – to transfer knowledge and recommend best solution to resolve previous problems

RESULT

- » Delivered 19 valid tests (three more than requested) without an occurrence of differential sticking
- » Reduced potential costs from additional well time and lost-in-hole tools
- » Extended production and mature asset life through better understanding of formation pressure, with respect to remaining reserves and level of depletion

OVERVIEW

Petroboscan, a joint venture in South America, wanted to understand the current reservoir pressures at its Boscán oil field which had been in production for more than 50 years. It was no easy task to retrieve formation pressure measurements from this mature reservoir, as it is in a depleted zone, with high inclination wells of 38°, and an environment for producing heavy oil. The operator’s main concern was differential sticking. Previous attempts by a third party to perform both wireline and logging-while-drilling (LWD) pressure testing in the Boscán field were unsuccessful in acquiring the necessary data, with some attempts resulting in lost tools and stuck-pipe issues, causing nonproductive time (NPT) and unexpected costs to the operator.

Sperry Drilling collaborated with the operator and provided reservoir insight and LWD expertise on reliable formation pressure measurement capabilities using its GeoTap® LWD formation tester service. The objective was to help the operator maximize asset value through enhanced reservoir understanding to extract the remaining reserves in this field for increased production.

Results from the GeoTap service exceeded Petroboscan’s expectations for this initial project by delivering 19 accurate tests, three more than requested due to low operational risks and excellent results obtained from the GeoTap service throughout the run. Testing and drilling to total depth (TD) were completed successfully without any occurrence of differential sticking or stuck-pipe problems.



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OBTAINING FORMATION PRESSURE MEASUREMENTS IN HEAVY OIL

To extract the remaining reserves in the Boscán field, two challenges had to be overcome: heavy oil and lost tools due to differential sticking. Acquiring pressure tests in areas with heavy oil can be difficult because of the viscosity of the fluid. Low mobility zones are a challenge for extracting a fluid with high viscosities. In a depleted zone with a hydrostatic pressure much greater than the pressure of the reservoir, a greater filtration of fluid occurs in the formation, and the tests can be affected by the supercharged pressure. Previous attempts to run wireline pressure testing in high-angle, overbalanced wells in this field encountered issues of losing wells to wellbore instability, and, on more than one occasion, a third party experienced lost pipe and tools because of differential sticking. Finding an alternative to acquire pressure testing was, therefore, a high priority of Petroboscan.

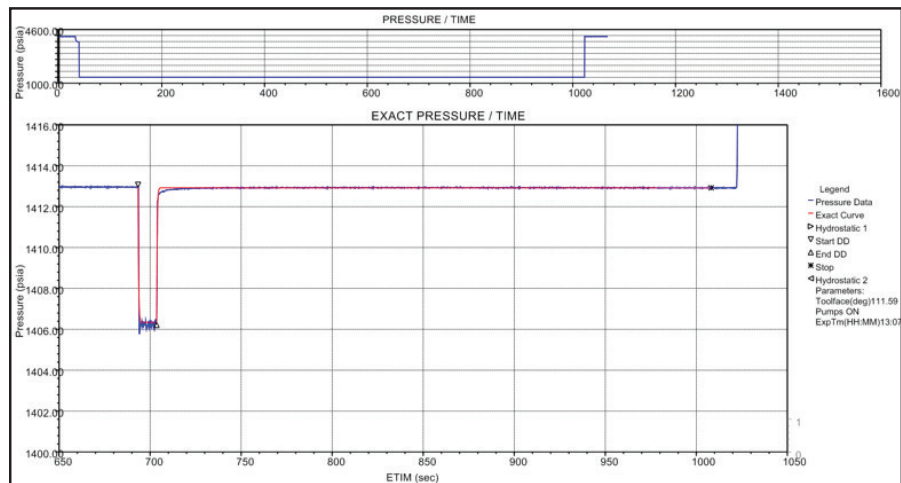
ENGINEERED LWD SOLUTION ENHANCES RESERVOIR UNDERSTANDING

After collaborating with and listening to the customer about the challenges and objectives, Sperry Drilling responded with the GeoTap LWD formation tester service as the ideal solution for the Boscán field. GeoTap service efficiently provided real-time, direct formation pressure measurements with accuracy and precision comparable to that of wireline formation testers, and with the added flexibility to stop or continue the test at any time. Its capacity to execute pressure tests in “flow-on” mode, or while circulating, prevented any occurrence of wellbore instability. Furthermore, the operator was able to rotate and circulate the bottomhole assembly (BHA) in between tests to alleviate potential stuck-pipe issues. GeoTap service bridges a critical gap in drilling safety and optimization, providing early and reliable measurements of reservoir pressure and mud density, and enhancing overall reservoir understanding.

EXTENDING PRODUCTION IN A MATURE FIELD

Petroboscan retrieved and utilized the necessary formation pressure measurements (from a total of 19 valid GeoTap service tests), not only eliminating any NPT from differential sticking, but also maximizing the value of its asset. Sperry Drilling and Petroboscan teams performed formation pressure tests safely while maintaining well control. The formation pressure measurements enhanced reservoir understanding of how the reserves were being drained. Knowledge of the pressure in the remaining reserves empowered Petroboscan to create new development plans for this mature field, locating wells in zones where the current pressure is above the abandonment benchmark.

Petroboscan’s goals were met, and then some, as it could now keep what was thought to be depleted, mature wells in Boscán field and produce from these wells for years to come. Building on this success, the operator plans to use GeoTap service to obtain formation pressure measurements to extend the life of its other mature field assets.*



Shows pressure test data from GeoTap service, which enabled the drilling team to determine the pressure of remaining reserves to more accurately determine the level of formation depletion.

*Note: Since GeoTap service was first applied in the Boscán field for LWD pressure testing, Petroboscan has used Sperry Drilling services to successfully drill nine new wells in the Boscán field, further extending production.

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