

Crucial Reservoir Pressure Data Prior to Field Recovery Strategies Saves Talos Energy USD 500,000

StethoScope service endures challenging downhole conditions to deliver reliable formation pressure data and resolve vertical connectivity uncertainties, GOM

Talos Energy used StethoScope* formation pressure-while-drilling service in a highly depleted reservoir section with >9,000-psi overbalance, minimizing operational risks and safely drilling a well at Tornado Field in the Green Canyon Block of the Gulf of Mexico (GOM). The data was vital to further understanding the dynamic and static reservoir pressures of the Tornado reservoir. StethoScope service eliminated subsequent wireline operations and saved Talos USD 500,000 in rig time.

Implement waterflooding to enhance field recovery

Talos Energy operates the Tornado field in the Green Canyon block of the GOM. As part of the waterflood strategy, the Tornado 4 subsea injector well was planned to include two completions: one in a known regional aquifer above the Tornado producing sands, and a second completion in the Tornado pay sand. This technique would enable intrawell flow between the aquifer and the producing horizon, providing a natural source of water and reservoir energy to the Tornado 1 and Tornado 2 subsea wells. By accessing the regional aquifer, the intrawell water injection requires no subsea or topside modifications. The waterflood should help arrest natural declines, add production, and materially enhance recovery of the Tornado field within the broader Phoenix subsea complex.

Crucial to this strategy is evaluating the energy potential (formation pressure) in the regional aquifer and determining the depletion in the producing horizon. The level of depletion, and therefore projected overbalance, was anticipated to be more than 9,000 psi, which exceeds the specification of many formation testers—both LWD and wireline conveyed. Key risks identified were differential sticking, losses while drilling, evaluation, losses while running and cementing casing, and zonal isolation.

Acquire crucial data in high overbalance conditions

Schlumberger proposed the StethoScope formation pressure-while-drilling service to efficiently acquire formation pressure data. The service is capable of meeting the overbalance requirement and mitigating the sticking risk of wireline-conveyed formation testers. While the tool is designed for 6,000-psi differential pressure, the StethoScope service is configurable for up to 9,500-psi differential pressure. Key design features include a stabilized collar designed with a series of offsets to minimize surface contact area. When deployed, the only points of contact are the set pistons, probe, and stabilizer. Short time-optimized pretest sequences (5 min) will enable short overall stationary times (~10–12 min).

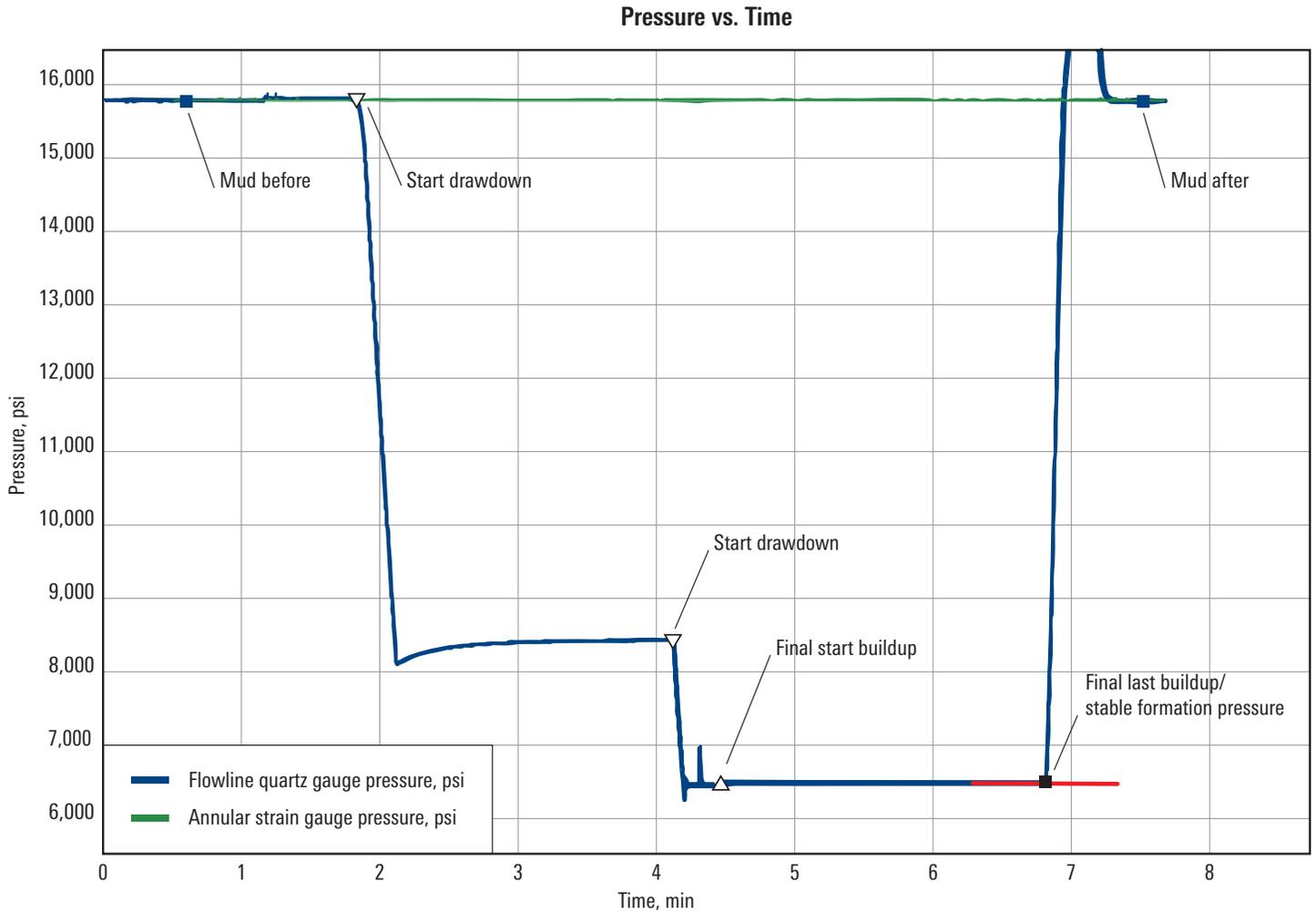
Saved rig time while improving understanding of formation pressure

Talos used StethoScope service to acquire 20 valid formation pressures over two hole sections, providing more reliable data for understanding the formation pressure in the regional aquifer and producing horizon. A maximum overbalance of 9,365 psi was observed in the depleted zone. And StethoScope service enabled Talos to resolve vertical connectivity uncertainties in individual lobes of the primary pay sand. This eliminated wireline logging runs at the conclusion of each hole section, and along with the short time-optimized pretest sequences, saved 2 days of rig time and more than USD 500,000.

Given complex downhole conditions, through a highly depleted reservoir section with >9,000-psi overbalance, minimizing operational risks was of high priority to safely drilling a successful well at Tornado. Obtaining reservoir pressures was crucial to further understanding the Tornado reservoir both in a static and dynamic sense. Being able to successfully acquire LWD StethoScope service pressures and eliminate further operations on wireline was a big win for Talos. We pushed the tool's limits and collected the valuable data we needed to move forward on the project. Schlumberger delivered and exceeded expectations. Saving us days on location allowed us to reach TD ahead of schedule and under AFE.

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Case study: Crucial reservoir pressure data prior to field recovery strategies saves Talos Energy USD 500,000



Pressure vs. time plot shows flowline pressure (blue) against wellbore reference (green). Drawdown was performed in two stages to mitigate unconsolidation risk for final stable formation pressure reading >9,300 psi below wellbore pressure.

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