

DrillPlan Solution Improves Well Planning Efficiency by More Than 50%, Williston Basin

Petro-Hunt tests DrillPlan solution proof of concept—uncovering opportunities for drilling risk mitigation and well design innovation

CHALLENGE

Overcome limitations to well design innovation caused by inefficiencies in well planning methodologies and traditional software workflows.

SOLUTION

Test the DrillPlan* coherent well construction planning solution in the DELFI* cognitive E&P environment for proof of concept (POC) for a challenging HPHT unconventional well in North Dakota in tandem with the current well planning process. The goal was to integrate the company's processes and policies, automatic and concurrent well engineering workflows, and drilling program generation with the DrillPlan solution to uncover opportunities for improving well planning efficiency.

RESULTS

- Provided an integrated platform environment that controls the entire well planning process—reducing planning time by more than 50%.
- Improved cross-discipline collaboration between engineering and geology and interaction with service companies.
- Integrated well planning workflows with the company's approval process.
- Decreased time and the potential for risk by employing automated tools, such as automated trajectory and anticollision scanning, using offset well trajectory data.
- Enhanced well design innovation through automated workflows that freed engineers to focus on more value-added tasks.
- Facilitated the creation of multiple planning scenarios with minimal overhead.
- Increased reliability of the design process with traceability and versioning.

Enhance well design innovation and planning effectiveness

Dallas-based Petro-Hunt L.L.C. operates in various fields in North Dakota, with many of its current wells in the core area of the Bakken region in McKenzie County. Because several of the company's wells in this area present a challenging well profile due to HPHT well conditions and extensive area development, Petro-Hunt is continuously seeking new ways to enhance well design innovation and increase planning efficiency to drill and complete its wells faster and more effectively.

Petro-Hunt recognized that it needed to reevaluate its well planning technologies and methodologies to mitigate bottlenecks for its engineers. The primary issues with the company's current process stem from the use of traditional software workflows, which hinder engineers from effectively creating multiple planning scenarios, and collaboration among a multidisciplinary well planning team and service company personnel during various stages of the company's well planning process. These have ultimately limited the time for the company's engineers to innovate their well designs in the region—impacting the efficiency and effectiveness of Petro-Hunt's operations.

To overcome these issues, Petro-Hunt consulted with Schlumberger to determine the best path toward a more effective, efficient solution.

Integrate company processes with engineering workflows in a collaborative environment

Schlumberger offered Petro-Hunt the opportunity to test the DrillPlan solution POC in the DELFI environment on a challenging HPHT well in McKenzie County. The well targeting the second bench of the Three Forks Formation had a 24,000-ft TD, bottomhole temperature of 300 degF, and requirement that the wellbore angle in the unit be no less than 45° to the N-S hardlines to meet state regulations and qualify for reduced setbacks. These factors resulted in a well profile challenged by high torque and drag values and collision risks.

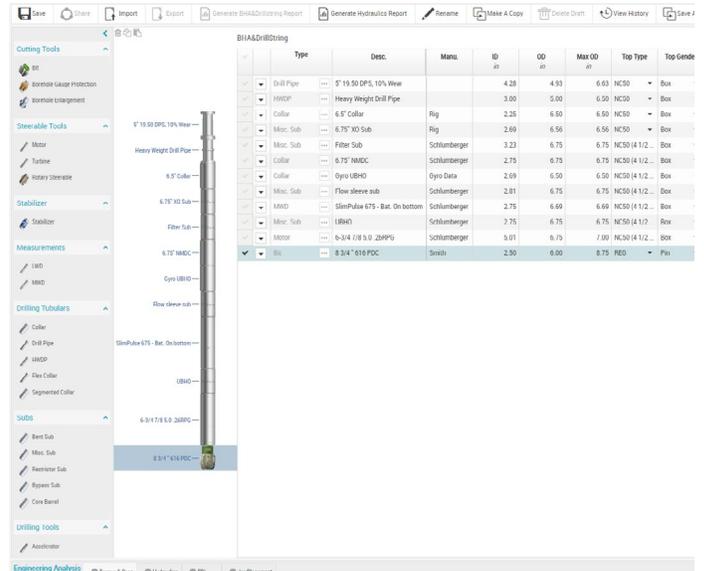
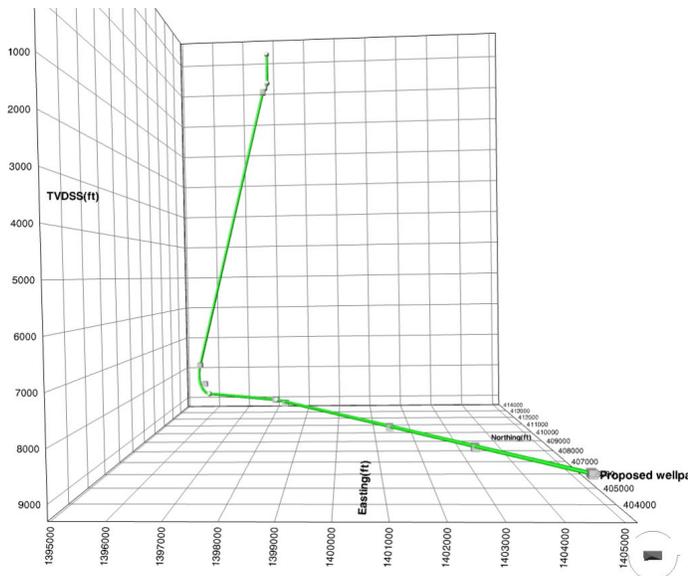
The DrillPlan solution was used to create well planning proposals that integrated Petro-Hunt processes and policies, automatic and concurrent well engineering, and drilling program generation. The solution freed up time for Petro-Hunt's engineers to focus on well design innovation on the challenging project—and communicate more effectively and collaboratively with geologists and other stakeholders, including service company personnel, to expedite tasks such as designing the BHA and mud, bit, and cement.

Ultimately, the DrillPlan solution revealed several areas for improvement to increase efficiency and well results compared with the company's current well planning technologies and methodologies.

"A comprehensive and powerful well construction platform that has the potential to deliver a well planning program in days rather than weeks"

Scott Peacock
Sr Drilling Engineer
Petro-Hunt, L.L.C.

CASE STUDY: Petro-Hunt decreases well planning time while enhancing well design innovation, Williston Basin



Automated trajectory design (left) and BHA mud design from service company (right) in the DrillPlan solution.

Reduced well planning time while revealing opportunities to mitigate drilling risks

The DrillPlan solution reduced planning time by establishing an integrated platform that controlled the entire well planning process, including design and execution. The result was a more than 50% reduction in well planning time.

With the DrillPlan solution, Petro-Hunt's well planning team was able to

- improve cross-discipline collaboration between engineering and geology and interaction with service companies
- increase planning efficiency by integrating well planning workflows with a stage-gate approval process
- explore more planning scenarios with minimal overhead
- increase the reliability of the design process with traceability and versioning
- use automated tools, such as automated trajectory and anticollision scanning, that incorporate offset well trajectory data to decrease time, cost, and risk
- enhance innovation in well design and efficiency because of automated workflows.

As a result of the successful application of the customer trial, Petro-Hunt began using the DrillPlan solution to plan wells across its portfolio beginning in February 2018.

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