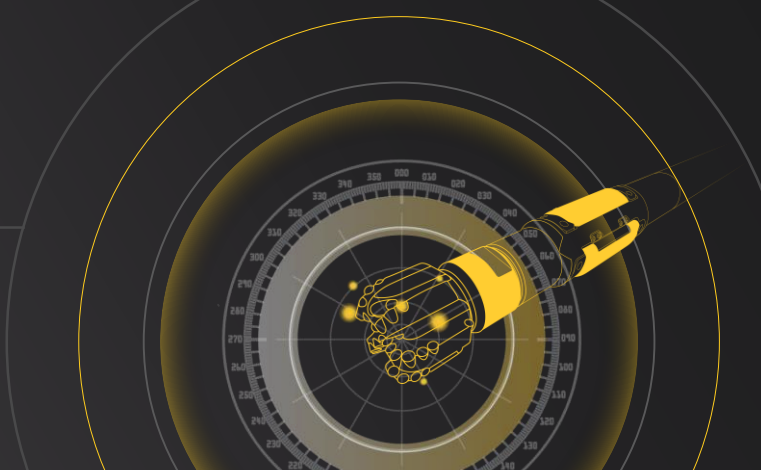


CASE STUDY

ZENITH™ RSS COMMERCIAL LAUNCH

Proprietary Rotary Steerable Systems



Wolverine Oilfield Technologies has completed several successful field trials and announces a commercial launch of its proprietary rotary steerable system Zenith™ 4 ¾”.

OVERVIEW

Zenith™ 4 ¾” was designed by Wolverine Oilfield Technologies, a subsidiary of NewTech Services Holding Limited, and was first introduced on March 3rd, 2021 at the Gibson Reports Virtual Rotary Steerable Event. Zenith™ 4 ¾” has completed several successful field trials, and is now ready for a commercial launch.

The Zenith™ RSS was specifically designed to offer new levels of reliability and performance while producing complex well trajectories at maximized penetration rates and optimized cost.

The Zenith™ RSS is a continuously rotating push-the-bit rotary steerable system providing full directional control and ensuring reliable and consistent performance in a wide range of drilling applications. Full and continuous rotation reduces drags and stick-slip risks, increases ROP and improves hole quality. Also, full rotation increases wellbore smoothness and decreases tortuosity, reduces drilling torque, improves drilling efficiency, and eliminates the need for unplanned wiper trips, ensuring an in-gauge wellbore for better log quality and faster casing and completion running.

Near-bit gamma, inclination and azimuth aid steering decisions and enable faster response to formation changes for an optimized well placement.

The Zenith™ 4 ¾” RSS has successfully been field tested in the U.S. and Russia. In field tests in Russia, the Zenith™ RSS has drilled 3 long horizontal sections, and improved ROP by 20%, provided full trajectory control and on-plan execution in all wells.

Zenith™ 4 ¾” is a step change in rotary steerable system economics meaning more market benefits from Wolverine’s RSS technology.

Wolverine Oilfield Technologies continues the development of the Zenith™ RSS series and has successfully completed the 6 ¾” series at Catoosa Test Facility in Oklahoma, USA. The 6 ¾” series will be available for field tests in Russia at the end of summer 2021.



» CHALLENGE

- Long horizontal sections
- Trajectory control
- Timely execution

» SOLUTION

**ZENITH™ 4 ¾”
Rotary Steerable System**

» RESULTS

Horizontal Sections

- 3222 ft
- 3228 ft
- 2608 ft

Dogleg Severity

- 0.31 - 1.93°/30 ft
- 0.09 - 2.34°/30 ft
- 0.35 - 1.9°/30 ft

Rate of Penetration

- 49 ft/h (+24%)
- 75 ft/h (+23%)
- 49 ft/h (+19%)

Real-Time Trajectory Control

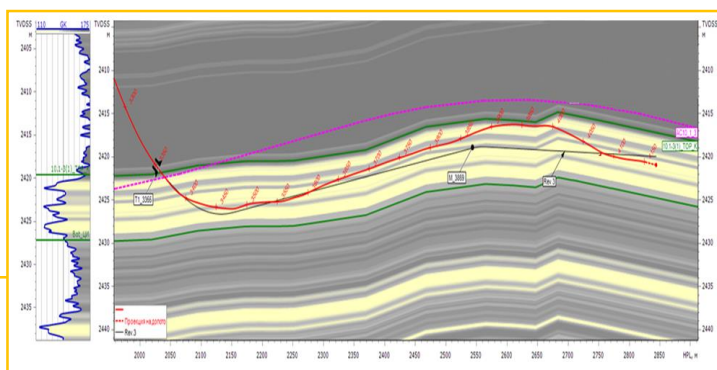
On-Plan Execution

**READY FOR
COMMERCIAL LAUNCH**

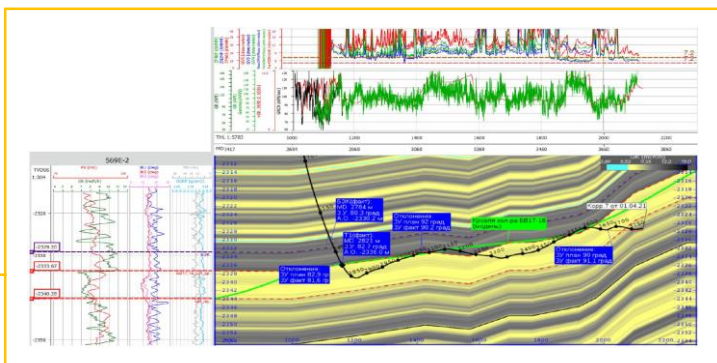


Field Test Time	Field Test Number	TVD, ft	Offset, ft	Horizontal Section, ft	DLS, °/30 ft	Actual AVG ROP, ft/h	Planned AVG ROP, ft/h	BHA Configuration
Dec'2020	1	8123 - 8133	4744	3222	0.31 - 1.93	59	49	Bit / RSS / High-Speed MWD / PDD / MFPWR
Mar'2021	2	7815 - 7858	6086	3228	0.09 - 2.34	92	75	Bit / RSS / High-Speed MWD / PDD / MFPWR
May'2021	3	8107 - 8130	4633	2608	0.35 - 1.9	52	49	Bit / RSS / High-Speed MWD / PDD / MFPWR / Stabilizer

Field Test 1 (West Siberia, Russia)



Field Test 2 (West Siberia, Russia)



Field Test 3 (West Siberia, Russia)

