CASE STUDY

GYROGUIDE REVEALS SIGNIFICANT GROSS ERROR IN HISTORICAL MWD SURVEYS, LEADING TO A LATERAL WELLBORE SHIFT OF MORE THAN 1 KILOMETER

TECHNOLOGY

- GyroGuide™ continuous multishot surveying system
- Casing collar locator (CCL)

APPLICATION

- Highly deviated wellbores
- Sidetrack surveying
- Wellbore placement accuracy verification

LOCATION

- Russia

INDUSTRY CHALLENGE + OBJECTIVE

An operator in Russia drilled a well almost two decades ago using only MWD survey tools. After revisiting the well to drill a sidetrack from approximately 4000-m MD, the operator found that their magnetic surveys were showing unexpected azimuth from both the MWD and RSS sensors despite being outside of the zone of magnetic interference. As a result, the operator decided to run a continuous multishot gyro survey to validate the data and establish the true position of the wellbore.

TECHNOLOGY + SERVICE SOLUTION

- The GyroGuide multishot surveying system was chosen for its high accuracy and ability to survey at high speed continuously versus a standard multishot survey, saving rig time.
- As this was a highly deviated well (70° inclination at 950-m MD), standard multishot systems could not be used in this application.
- The system was run on third-party wireline with a CCL to help ensure depth control.

RESULTS + VALUE DELIVERED

- The gyro surveys revealed that though the recent MWD surveys from the sidetrack were free from significant gross error, the historical data from the original well had massive azimuth discrepancies—up to 25°.
- The azimuth discrepancies led to the final wellbore position being off by 1143 meters from where the operator thought it was. For perspective, **this means that the wellbore location was inaccurate by 1.14 kilometers (Fig. 1).**
- It was still possible to drill where the proposed sidetrack where it would have been through a more complex drilling plan **(Fig. 2).**

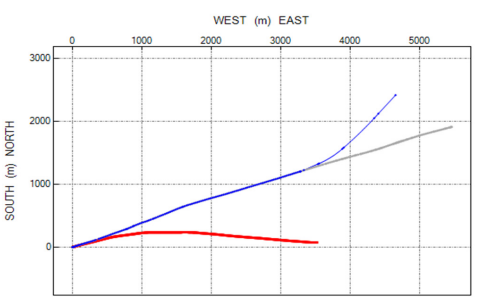

Fig. 1—The grey line shows the historical motherbore as originally surveyed. The blue line indicates the proposed sidetrack, while the red line shows the actual motherbore location as revealed by our surveys. The impact to the final location was a lateral difference of 1143 meters.

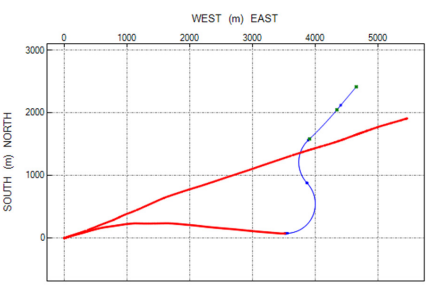

Fig 2.—By adapting to the actual wellbore location as revealed by the gyro survey, the operator was able to drill a complex path to where the proposed sidetrack would have been.

- We highlighted the importance of third-party verification during the drilling of wells. Handing the drilling of the well to a single contract means that there is no opportunity to verify performance or QC data.

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