

CASE STUDY

MICROGUIDE LOG ANALYSIS ALLOWS CLIENT TO REDESIGN TWO LOGGING STRINGS AND GET INFORMATION FOR MODELING STRESS AND EXPECTED FAILURE TIME OF CASING IN WELLS DUE TO GEOLOGICAL SHIFTING

▶ TECHNOLOGY

- MicroGuide™ wellbore tortuosity logs
- CAAT tool

▶ APPLICATION

- Tortuosity analysis
- 3D well representation
- String designs

▶ LOCATION

- Peru

INDUSTRY CHALLENGE + OBJECTIVE

A client in Peru suspected that the casing in several wells had been deformed and the trajectory changed due to movement of the formation layers close to the surface, so it could be difficult during interventions with different service strings required. Taking into account that running the strings could be a big challenge, the client decided to look for a company that provides high density data with a complete analysis to understand the current tortuosity of the well and provide extra information to model the stress and expected failure time of the casing.

TECHNOLOGY + SERVICE SOLUTION

- We suggested logging the wells every foot (high-density data) to know in detail the current trajectory of the well.
- Identify how many feet the wells have been shifted with respect to the original wellpath.
- Utilize the advantages of MicroGuide™ for tortuosity analysis and modeling the trajectory of the well in 3D.
- Run MicroGuide™ analysis with different service strings to model them and identify in advance the proper string configuration to avoid issues while running the logs.

RESULTS + VALUE DELIVERED

- High density data showed the three wells logged had a change in trajectory close to surface, reaching up to 6° of inclination on the section that was vertical when the wells were drilled.
- The wells have been moved up to 2 ft west in just over a 50 ft surveyed distance.
- MicroGuide™ analysis allowed in detail, the micro-tortuosity and micro-doglegs of the wells and model the current trajectory of the wells in 3D (See reference in the Fig.)
- With the MicroGuide™ analysis, the different service strings were modeled and some of them were redesigned because they could present difficulties to passing through the higher tortuosity.

3D representation of well profile. Casing diameter and horizontal displacements are exaggerated for illustration. Color temperature is proportional to the maximum diameter of a straight device, in inches. Markers indicate measured depth in feet.

