CASE STUDY

MICROGUIDE ENABLES OPTIMIZED ROD GUIDE DESIGN, SAVING $50,000 IN REPAIR EXPENSES AND 70 DAYS ANNUALLY IN WORKOVER AND LOST PRODUCTION COSTS

▶ TECHNOLOGY

– MicroGuide™ wellbore tortuosity logs

▶ APPLICATION

– Artificial lift system placement
– Rod guide design
– Production optimization

▶ LOCATION

– Anadarko Basin

INDUSTRY CHALLENGE + OBJECTIVE

An operator in the Anadarko Basin had been experiencing persistent rod guide failures on one of their artificial lift systems, with repairs necessary every 1.5 months for rod parting. The operator has used a standard rod guide design program and attempted to implement several different rod designs, but continued to encounter issues and up to 10 replacements. Further inspection revealed that significant sideloading against the tubing was causing the repeated fatigue failures. Each failure was averaging $5,000 to repair, causing up to 2 weeks of downtime, and yielding production losses of approximately 4 BOPD. To remedy these losses and develop a better plan moving forward, the operator requested an in-depth investigation of the wellbore's profile and condition.

TECHNOLOGY + SERVICE SOLUTION

☐ Initially, the operator only had single-shot data, which was showing that the well had an inclination of less than 1.7°; as such, the well was assumed vertical, which aligned with results using a traditional MWD log. Using the MicroGuide system, however, allowed surveys to be analyzed at 1-ft intervals for true high-resolution data logs.

☐ We identified a significant inclination spike at 3,000-ft MD, which had gone undetected using conventional MWD methods. After reviewing the tortuosity calculations from the MicroGuide system, it was clear that there were areas of compressive strength and buckling in the wellbore. These issues were causing the rod guide fatigue failures at 3,000-ft MD, where significant sideloading against the tubing was occurring.

RESULTS + VALUE DELIVERED

☐ Using the MicroGuide system allowed the operator to obtain a significantly clearer and more accurate depiction of the wellbore's condition by identifying the isolated dogleg at 3,000-ft MD.

☐ The high-resolution data improved modeling calculations, enabling development of a new rod guide design. After implementing the new design, the operator eliminated rod guide-associated failures.

☐ The system has so far saved the operator more than $50,000 versus the original costs of repair, as well as 70 days annually in workover and loss-of-production costs and downtime.

Side Force Graph — MD (ft) vs. Side Force (upstroke) [lbf/25ft]

gyro|data