Operator in Southern Mexico Doubles Oil Production in Low-Pressure Reservoir Using ACTive Services

Real-time data guides new interval perforation and matrix stimulation and minimizes deferred production

Increase oil production in mature carbonate well
An operator in southern Mexico wanted to perforate and stimulate new intervals in a well in a mature carbonate reservoir without impacting an existing producing interval that had some water content. Because a prolonged shut-in would not only generate a loss of revenue but would also necessitate a long nitrogen lift to restore production to this deviated, low-pressure well, the operator wanted to strictly limit deferred production. The operator also sought robust downhole data to guide the matrix stimulation.

Use ACTive services to acquire real-time data, perforate new intervals, and optimize stimulation
Schlumberger recommended using real-time data monitoring and precise perforation capabilities to revive the operator’s mature gas-lifted well. The ACTive OptiFIRE system was used to perforate two new intervals without the need to shut in the well or pump a fluid that could impair the existing or newly opened intervals.

Real-time confirmation of downhole detonation, with variations in downhole annular pressure and temperature indicating the effective opening of a new interval.
CASE STUDY: ACTive services double oil production in low-pressure reservoir, Mexico

Because no fluid was pumped to trigger the downhole detonation, the ACTive OptiFIRE system was able to monitor the true pressure and temperature responses of the well throughout the firing sequence by using sensors in the BHA and distributed fiber-optic technology. DTS measurements—along with downhole pressure and temperature, casing collar locator, and accelerometer data from the BHA—were instrumental in confirming the proper opening of new intervals. The data was also used to determine which interval to stimulate first to optimize the effectiveness of the subsequent stimulation treatment.

The flow port in the system enabled simulating the newly opened intervals immediately following the last perforating event without the need to pull out of hole to change the BHA. Using ACTive Matrix service improved stimulation effectiveness because the stimulation fluids could be applied directly along the new interval instead of requiring displacement of the working fluids typically used for perforating heads. ACTive Lift service contributed to more efficient, controlled well production restoration through the use of continuous wellbore pressure and temperature monitoring.

Doubled oil production while maintaining control of water production

Following perforation and stimulation of the two new intervals, production immediately doubled. This success was a result of acquiring advanced downhole and distributed data to confirm effective opening of the new intervals and to optimize the subsequent targeted stimulation treatment. Water production remained controlled, and the well continued to flow except for a few hours during the stimulation treatment, effectively minimizing the extent of deferred production.

*Mark of Schlumberger