CASE STUDY

Schlumberger

Successful Profile Diagnosis Maintains Producibility and Prevents Expensive Water-Conformance Treatment

First-time use of ACTive PS service and Flow Scanner system in the horizontal section of Shishito 11

CHALLENGE

Make first-time entry to log to total depth inside the horizontal section of well to determine water entries and possibly define water-conformance treatment.

SOLUTION

Deploy ACTive PS* integrated coiled tubing production services and Flow Scanner* horizontal and deviated well production logging system to determine the multiphase flow characteristics of the well.

RESULTS

Acquired quality, real-time data demonstrating various sources of water, including the hydrocarbon-producing well sections. This information helped PEMEX avoid a costly water-conformance treatment while reducing logistics and environmental footprint.

Production-profile diagnosis and water-cut assessment

PEMEX sought diagnostics and a solution to decrease water cut in its Shishito 11 well—the best oil producer in the Shishito field. The water cut had increased from 20% to 40% in a six-month period. Initially, PEMEX attempted to determine the water entry points and possibly define a water-conformance treatment by running a production log on cable. However, the log was dependent on the production log tools' ability to reach beneath the cable under gravity conveyance. Subsequently, it was not possible to run a log in the horizontal section of the well or obtain a production profile of the producing zones.

Real-time measurements with coiled tubing and production logging

The operator partnered with Schlumberger, the recognized leader in production logging in southern Mexico, to assist with the special needs of this production logging. The operator was specifically impressed with the ACTive PS integrated coiled tubing service and Flow Scanner logging system.

The ACTive PS service uses fiber-optic telemetry and downhole wireline data conversion to run real-time tools conventionally conveyed on wireline. Running the ACTive PS service and Flow Scanner system together would enable PEMEX to gather valuable information about the lateral section—in real time without killing the well. Schlumberger ran the toolstring inside a horizontal, expandable-screen completion that had not been entered since its installation four years earlier.

Substantial cost savings while maintaining production level

The high-quality, real-time data revealed water sources in various sections of the well, including the hydrocarbon-producing sections. Based on information from the ACTive PS operation, PEMEX decided not to perform any water conformance intervention in the short term. Water-conformance treatments can reduce permeability in water-producing zones and decrease the overall productivity of the well. This helped PEMEX avoid the expenses and risks of a water-conformance treatment. PEMEX continued to produce the well in its present state, maintaining hydrocarbon production.

Coiled tubing crew reviewing operational procedures.

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