

Pulling the Plug from a Deviated Well in the Gulf of Mexico

Successful wireline intervention requires instrumented tools that can deliver high performance in unpredictable situations

Instrumentation readings showed that debris and wellbore deviations were preventing the plug from coming up. Using ReSOLVE iX* extreme-performance instrumented wireline intervention helped ensure the plug was retrieved successfully.

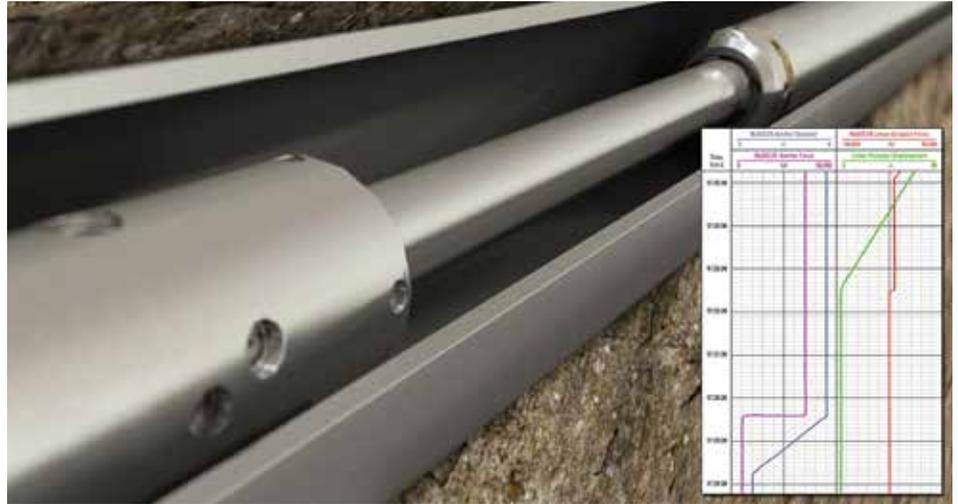
The right tools for a difficult job

As part of a workover at an offshore platform in the Gulf of Mexico, a bridge plug set in a highly deviated well section required removal. Due to the difficulties involved, the operator asked Schlumberger to deploy its ReSOLVE iX service to pull up the junk basket and the plug underneath.

Because some debris was expected, Schlumberger recommended an intervention package including the ReSOLVE iX service active debris removal tool. A key component of the toolstring included the anchor-linear actuator tool, which can be extended and retracted for performing multiple shifts in any direction, all in one run. A key feature of the ReSOLVE iX service's anchor-linear actuator tool is its use of real-time measurements to confirm the precise force and displacement applied downhole, with continuous measurements of displacement down to less than 1-mm resolution.

Pulling and pushing with 16,000 lbf of linear force

Once the intervention began, the Schlumberger team deployed the actuator tool, which is capable of developing up to 16,000 lbf [71,170 N] of stroke up or down. As a contingency, a WIReD* wireline inline release device was placed under the anchor-linear actuator tool so that the junk basket could be properly retrieved.



The ReSOLVE iX service's linear actuator tool uses real-time measurements to confirm the precise force and displacement being applied downhole, with continuous measurements of displacement down to less than 1-mm resolution.

During the first run with the actuator tool, the junk basket was latched and pulled free with 3,500 lbf [15,570 N] of upward force. Retrieved to the surface, the junk basket was full of debris. A second run was made using the same assembly to engage the third-party bridge plug. After latching was confirmed, the anchor was deployed and the linear actuator was retracted. As expected, the plug equalized after traveling 2 in, which matched the plug specifications for stroke and force.

Complex movements via precise instrumentation

After stabilizing the wellbore pressure, the wireline stroke released the plug and sheared the pin. After waiting the required time to allow the plug's rubber components to retract properly, the anchor disengaged and an overpull was noted. Four subsequent movements were made to drag the plug upward and the same overpull was measured each time.

Because instrument readings showed that the plug had been properly released, it was concluded that downhole conditions were preventing circulation around the plug and that the debris surrounding the plug and inside the mandrel was preventing it from fully equalizing the pressure. The decision was made not to continue pulling but to gently move the plug down to wash it. After the toolstring was moved lower in the well, the tension and pressure dropped, allowing the plug to be retrieved successfully back to the surface. The challenge had been addressed and the operator was able to proceed with a successful workover.

The tool's precise instrumentation had fully met the operator's objective, and the resulting operational residual risk was lowered to a level that was previously impossible with existing intervention technology.