

TeleCoil Intelligent Coiled Tubing Service Optimizes Coiled Tubing Operations

System saves valuable operating time with real-time logging capability



An onshore Pohokura field well located in Taranaki, New Zealand, exhibited reduced production rates due to scale deposition across the perforated zones. An acid wash delivered via coiled tubing (CT) was planned to remove the scale and any other wellbore debris. The operator wanted the ability to run real-time production logging tools (PLT) following the treatment to confirm the effectiveness of the acid wash.

Due to the trajectory of the wellbore, coiled tubing was required to convey the PLT tools to plug back depth of 24,865 ft (7,396 m). The extended-reach well was completed with 5-in. production tubing landing into a seal assembly and polished bore receptacle (PBR). Complicating the proposed intervention even further, the PBR section was damaged, which created a restriction that had interfered with previous coiled tubing runs.

The operator selected Baker Hughes CT services utilizing the TeleCoil™ intelligent coiled tubing service to optimize the scale removal process and the ability to run real-time logging tools.

The non-intrusive TeleCoil conductor wire was installed in 27,000 ft of 2-in. outside-diameter CT. Not only was this the longest installation of the TeleCoil service at the time, it was also the first time the TeleCoil service had been run in New Zealand using a third party's logging tools. Although there were concerns about resistivity of the TeleCoil service and the length of the strings, Baker Hughes was able to design a crossover from the TeleCoil service's depth counter/encoder to the third party's logging equipment that worked perfectly.

Benefits

- Prevented damage to logging tools
- Improved job design
- Reduced time downhole and equipment costs

Background and challenges

- Pohokura field, Taranaki, New Zealand
- Extended-reach well with maximum deviation of 86°
- Scale depositions
- Target perforation interval of 21,480 to 26,898 ft (6574 to 7284 m)

Baker Hughes solution and results

- Provided the Baker Hughes TeleCoil intelligent coiled tubing service
- Optimized operation with live casing collar locator
- Acquired real-time downhole pressure and temperature
- Provided depth confirmation while passing through diameter restrictions
- Deployed coiled tubing tools to a maximum depth of 23,950 ft (7300 m)
- Optimized logging program with real-time capability

While running into the well with the TeleCoil Integrated Sensor assembly and jetting nozzle, real-time casing collar locator (CCL) information provided the necessary depth accuracy. The live CCL pinpointed the exact location of the bottomhole assembly, providing adequate time to reduce the in-hole speed to a safer rate.

The live CCL readouts also ensured that the CT was precisely placed at the perforated interval while pumping 300 bbl (48 m³) of 7.5% hydrochloride at 2 bbl/min (0.005 m³/s). During the acid treatment, downhole temperature and pressure data was observed as the acid reacted with the scale deposits.

Following the acid treatment, the integrated sensor was quickly replaced with the logging adapter assembly. The logging adapter connects to the coiled tubing connector without the need to rewire the electrical connection. Third-party logging tools were attached to the logging adapter, providing the required power to acquire the

real-time data needed to optimize the logging program.

During the initial logging run, live surface data indicated inadequate spinner response at slow running speeds. Modifications to the CT running speed were made in real-time to correct the PLT response. Additionally, during production logging, the real-time data indicated that the spinner log was exceeding its maximum rotating speed. In order to maintain valuable logging data, the well was choked back to a lower production rate, allowing the spinner log to run within its specifications.

The ability to run real-time logging instruments using the TeleCoil service enabled the operator to optimize the operation on the fly to ensure accurate data is collected. The TeleCoil service saved more than 15 hours of operating time with its ability to modify the logging parameters and avoid miss-runs due to inoperable tools.