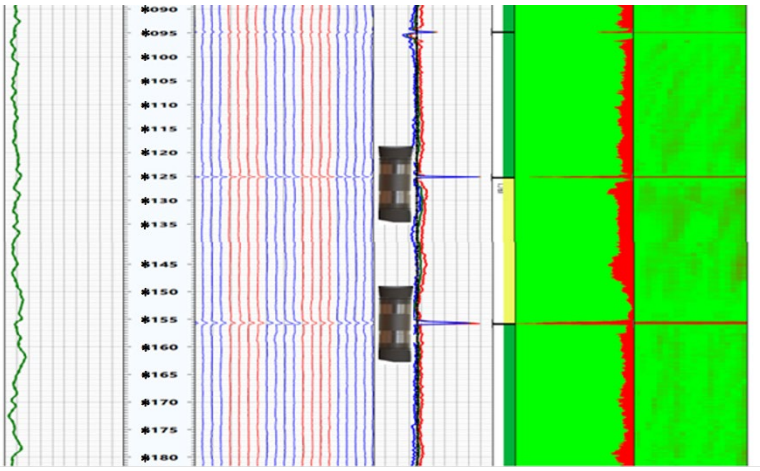
Permanent Tubing Patch, Rigless Well Integrity Diagnostics Restores Oil Production in Two Wells, Saves CAPEX of $3.8 Million USD



MFC data interpretation plot showing the leak points and installed patches against accordingly.

Objectives

- Identify the source of the tubing leak points that caused an electrical submersible pump (ESP) malfunction. Approximately half of the wells on the rig experience the same issue. The conventional approach involves replacing the existing tubing with new tubing or installing corrosion-resistant tubing. However, this method entails scheduling a well for rig workover intervention, resulting in production downtime and losing revenue.

Our Approach

- A key concern for the customer was that any alteration to downhole pump parameters led to malfunctioning of the ESP.
- The customer contacted Weatherford Wireline Interpretation and Evaluation (IES) and Well Services teams and asked for a solution rather than incur a workover to avoid the nonproductive (NPT) or down time of almost 90 days.
- Weatherford experts crafted a rigless solution. The plan included logging those two wells with a multi-finger corrosion tool to identify the highest tubing leak points, check the whole tubing integrity, and then run a production logging tool in injection mode to identify the injection fluid entry points.

LOCATION
Middle East

WELL TYPE
Development

HOLE SIZE
3-1/2 in.

TEMPERATURE
172°F (77°C)

PRESSURE
2,250 psi (15.5 MPa)

DEPTH
6,160 ft (1,877 m)

PRODUCTS/SERVICES
- Wireline Services
- Well Services
- Thru-Tubing Services

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Our Approach (continued)

- The first challenge were the leak points. They were situated across the collars in one of the wells and it was challenging to properly identify them. After a detailed study of the 3D/3D tubing images and views and the outputs from the injection logging, the Weatherford IES team identified the leak points.
- The Weatherford team turned its attention to the second challenge: determine the viability and effectiveness of running the tubing patch in both wells before running in hole and installation.
- The solution involved using a detailed corrosion analysis across the joints of interest to check the tubing metal loss and ovality. The team deployed an ISO EasySet setting tool which operates via e-line communication from the surface. It provided a slow setting sequence to the tubing patch for safe and accurate installation.

Value to Customer

- The Weatherford solution restored the well integrity back to production and prevented the ESP pump failure.
- After the successful operation, the ESP switched on with good parameters and the well started to produce, with good oil gain of almost 300 STB/D and diverted to gathering center.
- By eliminating the necessity for rig workover operations and replacing the ESP pump, the customer achieved a cost and time savings of $3.8 million USD.