

Case study: Karshi, Uzbekistan

UniFlex liner hanger/packer deployed remotely in challenging well during pandemic, avoided suspension

An Uzbekistan-based customer needed to deploy a 7-in. liner to the setting depth, set the liner hanger, cement the liner, activate two inflatable packers, and finally set the liner top packer to prevent suspending drilling operations. The COVID-19 pandemic, however, added a new challenge. Quarantine restrictions locked down border crossings to the rig location and prevented the mobilization of field supervisors. The customer needed to manage the entire operation remotely, and, while other service providers could not accommodate, Baker Hughes accepted the challenge.

Rated at 10,000 psi (68.9 MPa), the **UniFlex™ liner hanger/packer** is a field-proven one-piece liner hanger packer. The tool can be set hydraulically, eliminating pipe manipulations, and can be rotated during run-in, enabling it to pass tight spots and during cementing. From a supply chain standpoint, the UniFlex hanger was assembled in the Tyumen plant, which is close to both Kazakhstan and Uzbekistan, and the tool was quickly delivered to the rig location.

To overcome the unique challenges presented by the pandemic, Baker Hughes experts recorded informative videos for the customer's field personnel detailing the required procedures. Additionally, the two teams attended several video conferences to discuss the sequence, the critical stages that could occur

during the operations, and the various health, safety and environmental (HSE) factors. When the actual operation commenced, the Baker Hughes team ran a non-stop, 24/7 video meeting to consult and support the field personnel.

Following the initial success from the first installation, Baker Hughes quickly moved to support further installations. During the fourth installation on the third well, however, various conditions compelled the customer to use heavyweight mud (up to 19.3 ppg) with a high concentration of barite in the water-based mud, which led to the accumulation of particles within the clearances of the tools. As a result, the deployment of the liner hanger system faced problems, which the remote support team worked with the field crew to overcome. The running tool could not be released hydraulically and, despite a drillpipe disconnecting, the team successfully mechanically released from the liner hanger.

Following completion of the cement job, the running tools got stuck due to the barite settlement when trying to pull out of the hole after setting the liner top packer. The open hole proved unstable, with tight spots, formations with different pressure regimes creating losses with no return during run-in, or gain if the mud weight was decreased.

Despite these challenges, the field personnel and the remote Baker Hughes experts worked in tandem to

Challenges

- Deploy 7-in. liner hanger through difficult well conditions
- Overcome high concentration of barite
- Organize all activities during COVID-19 pandemic

Results

- Deployed UniFlex liner hanger to setting depth without issue
- Performed all operations remotely and providing ongoing rig operations
- Saved operator 4 days of rig time and an estimated \$200,000 USD over 4 installations
- Improved integrity of wellbore construction by isolating instable formation zones with 7-in. liner
- Experienced no health, safety and environmental (HSE) issues or nonproductive time (NPT)

run the liner to the setting depth of 10,055 ft (3065 m) under total losses and heavy water-based mud full of barites. The team mitigated all challenges due to the structures of formations that showed expulsion of gases and absorption of circulation in a different intervals of the well. The liner was run to the setting depth, passing successfully through all the tight spots in the open hole. The UniFlex liner hanger was activated with no issue, and hung the liner 16.4 ft (5 m) above the bottom as per the customer program.

With the successful remote installation, the customer can proceed with drilling the 6-in. hole section, deploy the subsequent 5-in. cemented liner, and reach the target zones.

By being able to mobilize and operate remotely, Baker Hughes displaced competitors and gained a new level of trust with the customer.