

Case study: Middle East

Completion barrier valve eliminated CT operations, saved \$1 million USD in extended reach well

A customer in the Middle East faced numerous challenges while planning to run upper completions in extended-reach oil wells. The customer risked formation damage from uncontrolled completion fluid losses, which would make displacement to inhibited brine impossible. Underbalanced conditions would also make well control and upper completion packer setting difficult. Conventional approaches to these applications involved expensive coiled tubing (CT), wireline tractors, and multiple trips which incur substantial rig time and costs. And, conventional slickline plugs were not an option because of the long, horizontal laterals.

Given the existing challenges, Baker Hughes recommended installing the **Completion barrier valve (CBV)**. Baker Hughes isolation valves deliver reliable isolation between the upper and lower completion and enable interventionless hydraulic opening to save downhole trips and reduce OPEX. Isolation valves allow packers to be installed without the use of additional nipples and plugs. And, using unique remote-opening modules, these valves can be hydraulically opened by simply applying tubing pressure cycles. The module offers an adjustable number of open and close cycles-up to 20, and can be externally tested prior to valve deployment.

The CBV was included as part of a comprehensive lower completions solution consisting of **EQUALIZER CF**

SELECT Plus™ inflow control devices (ICDs) with multitasking valves (MTVs). The MTV temporarily blocks flow through the EQUALIZER module to allow running of the ICD without an inner string, enabling hydraulic activation of packers without fluid loss. The plan also called for four **MPas™** and four **REFlex™ openhole packers**, a **HMC™ hydraulic set liner hanger**, and a **Hyflo-III™ liner top packer**. The lower completion was deployed to a target depth of 7,100 ft (2164 m) in the open hole with the isolation valve open and shifting tool engaged inside the lower completion. After the lower completion was set and successfully tested, the running and shifting tools were pulled, released, and the CBV was mechanically shifted into the closed position using a service string shifting tool. Subsequently, the CBV was positive and negative inflow tested to confirm sealing integrity. Finally, the valve was opened remotely with multiple pressure cycles from surface without the need of mechanical intervention.

By eliminating CT operations for plug setting and retrieval, the customer was able to realize savings of \$1 million USD.

They were pleased with the results and will use Baker Hughes isolation valves for the full field development and will consider them for use in other fields to aid in fluid loss prevention, formation isolation during upper completion installations, and completion packer setting without additional interventions.

Challenges

- Extended-reach wells with long, horizontal laterals
- Difficulty displacing wells to inhibited brine
- Risk of uncontrolled losses and formation damage
- Underbalanced well conditions
- Conventional slickline plugs could not be deployed

Results

- Saved approximately \$1 million USD by eliminating CT operations for plug setting and retrieval
- Enabled deployment of upper completion in a single trip
- Provided a well control barrier in underbalanced conditions
- Eliminated the loss of kill fluid and risk of formation damage during upper completion deployment