

Case Study

PrimeSET Liner Hanger combines with flotation sub to simplify extended reach lateral installation

CANADA, MONTNEY
PRIMESET LINER HANGER, TREX SYSTEM

An operator working in the Elm field of the Montney formation in northwest Alberta was looking to overcome challenges previously experienced while installing completion systems in extended reach laterals. The robust capabilities of the PrimeSET® Liner Hanger were identified as the ideal solution to enable rotation during installation and ensure the next system reached the desired total depth (TD). Additionally, Packers Plus worked closely with the operator to further simplify operations by combining the PrimeSET Liner Hanger with a glass barrier sub for the successful flotation and installation of the system. The glass barrier sub prevents fluid from entering the lower portion of the completion string, increasing buoyancy of the lower string and reducing friction during installation, while fluid weight above the sub facilitates getting the tool string to the planned depth.



Challenge

The continuing trend towards extended reach horizontal has compounded the challenges operators face during the installation phase of completion operations. Typically, the weight of the casing string in the vertical section of the wellbore is used to push the completion system through the horizontal section to the desired planned depth. When the ratio of measured depth (MD) to total vertical depth (TVD) of the wellbore is high (i.e. the horizontal section is significantly longer than the vertical section), installation operations are hampered by insufficient completion string weight in the vertical section.

Some of the conventional methods to improve installation efficiency include the use of heavy weight drill pipe (HWDP) above the liner hanger, the use of completion tools that allow for rotation (torque through) or jarring of the system, and circulating with fluid additives. However, if these operations cannot overcome the friction forces caused by the drag of the completion string along the bottom of the wellbore, it may become stuck,

resulting in additional costs or revenue losses.

Solution

A recent innovation has been the design of tools that enable casing flotation of extended reach completions. In this method, a glass disc barrier is placed in the drill pipe or the tool string to maintain fluid in the upper completion while preventing fluid from entering the lower completion. In this way, fluid in the vertical section provides added weight to push the lighter, buoyant horizontal section of the completion such that it can be “floated” into the lateral.

To enable successful installation using a glass barrier sub and the PrimeSET Liner Hanger, Packers Plus performed engineering modifications and flow testing in an expedited timeframe to ensure a wiper dart would pass through both tools following cement operations, ensuring a clear wellbore prior to stimulation operations. Additionally, Packers Plus technical experts ensured hydraulic activation pressure of each tool in the completion system was ordered in the correct operational sequence.



Results

An operator working in the Montney formation using a cemented sleeve completion system run on 114.3 mm (4.5-in.) liner for an extended reach well with a measured depth of 5,038 m (16,525 ft) and a true vertical depth of 2,320 m (7,610 ft). The full completion string included two Packers Plus Toe-APT[™] Hydraulic Sleeve subs to initiate flow and stimulate the first stage, and a PrimeSET Liner Hanger. The glass barrier sub was run on drill

pipe with five stands of HWDP above the PrimeSET Liner Hanger.

Torque and drag simulation modeling performed prior to the installation was close to observed installation weights on bottom (~34,000 daN) and after the completion string was successful run to planned depth, the glass barrier sub functioned within 2 percent of the shear pin setting. The rest of the Packers Plus tools in the system functioned as designed and, with the successful first run of the PrimeSET Liner Hanger with a glass barrier sub, the operator deployed the combination of tools on other wells in the area.

The PrimeSET Liner Hanger is part of the Packers Plus TREX® Cemented Product Line. The TREX line offers solutions such as liner hangers, composite and dissolvable frac plugs, hydraulic toe sleeves and ball-activated sleeves for single point entry or limited entry stimulation. For more information, visit packersplus.com.