Case Study

StackFRAC HD-X enables higher pump rates and tonnage for increased production in extended reach lateral

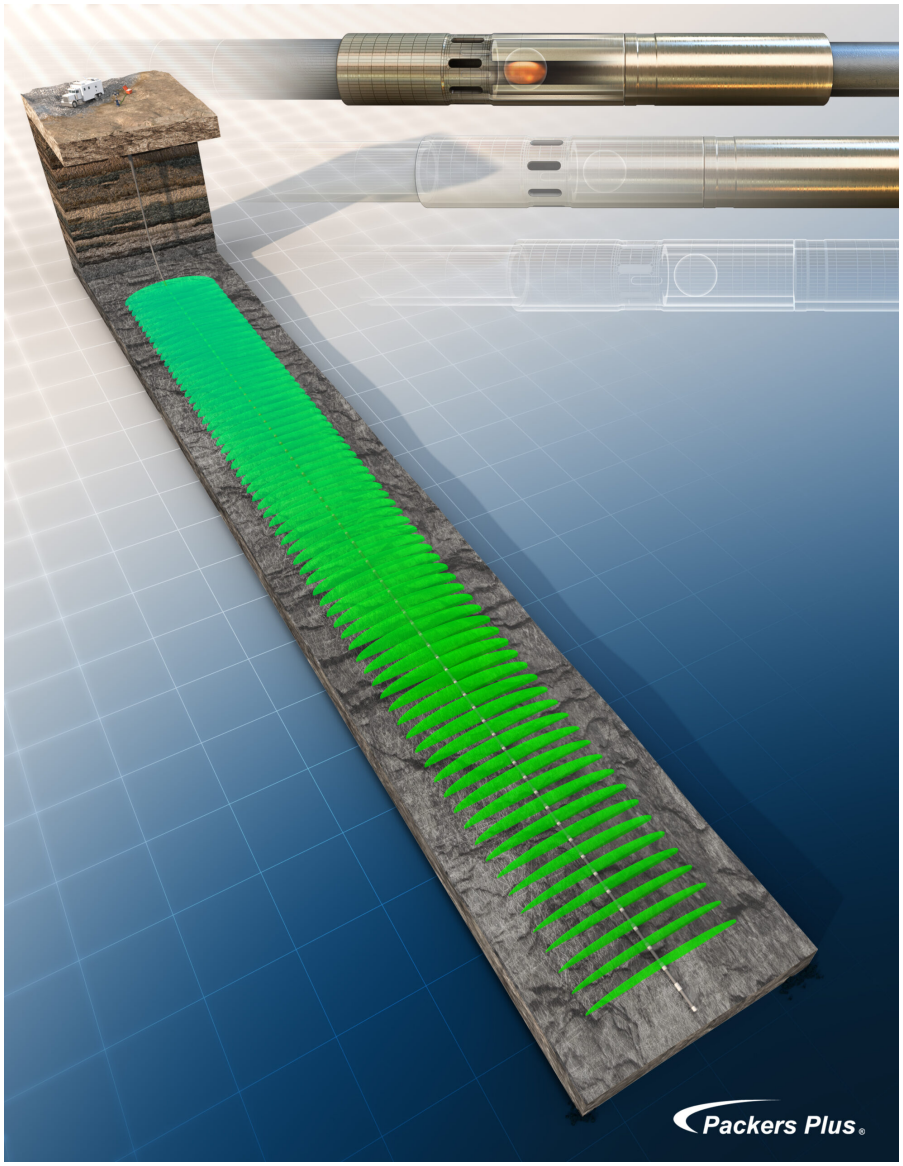
CANADA, MONTNEY
STACKFRAC HD-X SYSTEM

A Montney operator has worked with Packers Plus over the years to continuously adapt its completion systems while drilling deeper and longer wells. One of the recent wells in the company's evolving completion program included a 70-stage open hole ball-activated completion installed in a lateral of more than 3,900 m (13,000 ft).

By combining Packers Plus's latest advancements in multi-stage completion technology, the producer was able to deliver the optimal stimulation pump rate and treatment, while ensuring full stimulation coverage across the reservoir and maintaining ideal stage spacing.

Challenge

Drilling deeper and longer wells enables producers to improve operational efficiency by accessing more reservoir and increasing production potential at a lower total well cost. To achieve the production potential, operators must identify the right completion system to deliver an optimal stimulation treatment – which typically involves tight stage spacing, high pump rights and high tonnage volumes. Many completion systems perform sub-optimally as lateral lengths grow longer.



Solution

Some of the key Packers Plus technologies deployed as part of the Montney producer's 70-stage completion system, included:

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StackFRAC HD-X builds on revolutionary ball-activated completion technology that has been used in more than 200,000 stages worldwide. The system allows for exact placement of stimulation treatments in one continuous pumping operation, reducing operational time and cost. This latest evolution of the system includes ball seat increments smaller than 1/16-in. to enable the delivery of high intensity stimulation treatments, while maintaining a minimal pressure rating. In addition to increasing the number of stages in a well, the smaller ball seat increments of StackFRAC HD-X provide a larger inside diameter (ID) throughout the length of the wellbore to allow for higher stimulation rates.

The smaller increments are protected against erosion during stimulation using proprietary

Inner Armor coating on select ball seats in the completion system. With this added protection, producers are able to increase pump rate and tonnage per stage while maintaining the integrity of the downhole equipment.

Utilizing SFD903 Dissolvable Balls in the completion eliminates the need to flow balls back prior to production, reducing operational risk.

The length and weight of the longer tool string requires the assistance of the AeroSTAT Glass Barrier Sub to reach total depth (TD). A glass disc in the casing flotation sub acts as a barrier that isolates fluid weight above the sub and creates an air chamber that lightens the completion string in the lateral, enabling the system to float as it is run in hole.

Results

As Packers Plus ball seat technology continued to evolve, the operator continued to increase its lateral lengths, pump rate and tonnage – leading to the 70-stage open hole ball-activated system deployed across a lateral of more than 3,900 m (13,000 ft).

The smallest ball seat size in the system was 1.960-in., which enabled higher frac rates at the toe of the well and also allowed for coiled tubing access for clean out if needed, as well as a larger ID for production flow area.

For the Montney producer's longer laterals, deploying the AeroSTAT casing flotation sub helped create enough weight at surface to reach TD. Without the casing flotation sub, weight on bottom was recorded at just over 7,400 daN (16,000 lbf), while weight on bottom with AeroSTAT was recorded at 26,000 daN (57,000 lbf).

A comparison of the producer's wells from 2015 to 2021, highlights how the combination of several advanced completion technologies has allowed the operator to continuously advance its stimulation program and increase the potential of maximizing production.

	2015	2021
Stage Count	46	70
Stage Spacing (m)	46	55
Lateral Length (m)	2142	3915
Measured Depth (m)	4550	6475
Frac Tonnage (t) per Stage	50	90
Frac Rate (m3/min)	6 - 10	6 - 12
Smallest Seat (in.)	1.375	1.96

With a reputation as the premier open hole ball drop completion system provider, Packers Plus has expanded its offerings in recent years to include innovative technologies for a variety of applications and multiple segments of a well completion. The common theme among all these product portfolio additions is they are designed to help producers improve operational efficiency, reduce risk and improve completion programs.