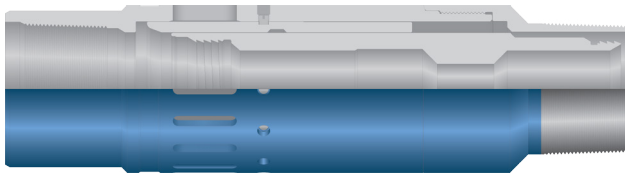


CASEhistory

Gryphon Oilfield Solutions Retrieves Ball Seats in Four Hours Resulting in Significant Savings

SUREstack™ RT
Retrievable Frac Valve



Seat Retrieval Job Report

Stage	Time	Valve Depth (m)	Tag Depth	Correction	Weight set on valve (daN)	Amount of over pull (daN)	N ₂ Rate (SCM)	Fluid Rate (liters/min)
1	2:10	1419.26	1417.20	2	2	2	10	40
2	2:13	1473.54	1471.20	2.3	2	2	10	40
3	2:17	1565.42	1564.80	1.4	2	2	10	40
4	2:20	1621.03	1620.00	1	2	2	10	40
5	2:25	1708.76	1706.90	2.2	2	2	10	40
6	2:31	1826.68	1825.90	1.3	2	2	10	40
7	2:55	1920.69	1915.20	3.1	2	2	10	40
8	2:59	1989.60	1917.50	3.3	2	2	10	40
9	3:03	2033.25	2028.90	4.3	2	2	10	40
10	3:07	2101.27	2095.30	5.9	2	4	10	40
11	3:11	2170.53	2166.10	4.3	2	4	10	40
12	3:16	2278.39	2273.80	4.4	2	4	10	40
13	3:22	2396.38	2390.90	5.3	2	4	10	40

Customer Challenge and Solution

An operator wanted a completion system which provided full wellbore ID, without performing a post fracturing milling operation, while saving time and avoiding damage to the formation with unwanted fluid debris caused by milling operations.

Technical Solution

When utilizing conventional fracturing valves with ball seats, milling is required to remove the seats from the wellbore. Currently, the average number of fracturing stages per well is 12 – 15 and milling time ranges from 20 – 45 minutes per seat, plus post milling clean-out.

In this case, the operator wanted to run 14 stages (including a hydraulic actuated valve), 4.5 inch 11.6 ppf (114.3 mm 17.26 kg/m) in a 8,169 ft (2,490 m) deep well with a 6.14 inch (156 mm) open hole in the Banff formation.

Gryphon provided the SUREstack™ Multistage Hydraulic Fracturing System with field proven retrievable ball seats. Gryphon's patented, fully retrievable ball seat technology requires no milling or drilling while maintaining the benefits of the ball drop completion method. The ball seats are retrieved utilizing coil tubing or jointed pipe with a simple set down and release mechanism to latch and release multiple seats in a single trip, leaving the wellbore with full bore ID.

Performance in the Field

The Gryphon completion system was installed, set and pressure tested and the well was successfully fractured with 28% HCL pumping +/- 189 bbls (30 m³) per stage as per program.

2.0 inch (50.8 mm) coiled tubing was run in the hole at 1:20 pm to retrieve the seats. Even with working through a tight spot at 6,218 ft (1,895 m), all 14 seats were successfully retrieved and back out of the hole by 4:30 hours without any issues. That's 3 hours and 10 minutes total run time to achieve a fully driftable wellbore without damaging the formation with unnecessary fluid or debris pumped into the formation.

This case history validates the efficiency of the Gryphon SUREstack™ RT retrievable ball seat system compared to conventional millable systems.

