

Well depth	17,800 ft [5,425 m]
7-in liner setting depth	9,100 ft [2,774 m]
Gas injection depth	15,900 ft [4,846 m]

Background

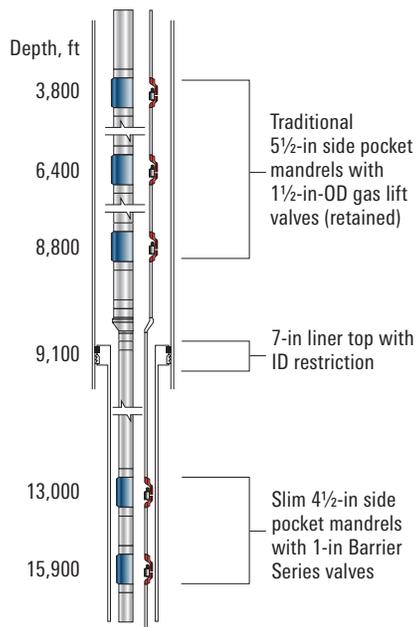
Extended-reach wells presented a challenge to the use of gas lift in the North Sea. The smaller liner sizes used at greater depths limit mandrel and gas lift valve diameters. Moreover, at high inclinations, the use of slickline for changing out valves becomes more problematic. CT and electric line tractors provide a solution but increase intervention costs. Setting the valve higher up the well where the inclination is smaller would facilitate slickline usage but result in suboptimal production.

Technology

- 1-in Barrier Series gas lift valves
- KGB-2 slim-OD side pocket mandrels

75% Increase in Gas Injection Depth Optimizes Oil Production in Extended-Reach Wells, North Sea

1-in Barrier Series gas lift valves and slim side pocket mandrels maximize performance and enhance reliability



Schlumberger installed two 1-in Barrier Series gas lift valves in slim 4½-in side pocket mandrels that had a special 6-in drift OD suitable for the 32-lbm/ft, 7-in liner. As a result, the gas injection depth was extended from 9,095 ft (just above the liner top) to 15,900 ft, where the well deviation is 69°, optimizing drawdown and production.

Each barrier valve incorporates a high-specification, metal-to-metal back check sealing module that has been developed and tested to meet strict quality, leak-rate, and performance standards, providing a robust seal between the tubing and the casing annulus. The check design uses enhanced geometry to minimize erosion during high-rate operations.

The improved design specifications increase performance and reliability of the gas lift system, minimizing well interventions.

Tubing-to-annulus communication is tested every 6 months. Since the initial installation in early 2016, no leakage has been detected.