FlexRite® System Provides Statoil with Solution for High-Pressure Injection Wells in the North Sea

LATERAL ACCESS SOLUTION ENABLES STATOIL TO INCREASE PRODUCTION AND REDUCE COSTS
NORWEGIAN SECTOR OF NORTH SEA

OVERVIEW
For a high-pressure injection well in the North Sea, Statoil required a TAML Level 5 multilateral junction that could be constructed from a subsea platform. The system needed the ability to accommodate high injection pressure and possible large pressure differences between the two lateral branches in two different reservoirs. In response, Halliburton designed a 10 3/4-in. FlexRite® isolated tieback multilateral system with lateral access, a high-pressure junction, and large flow capacity. The FlexRite Lateral Access (LA) system provided the capability for high-pressure water injection into two different reservoirs, from one multilateral well. Success of this system helped Statoil reduce its subsea investment and obtain higher initial and accumulated production.

CHALLENGES
» Construct a TAML Level 5 multilateral junction from a subsea platform
» Withstand high injection pressure and possible large pressure differences between branches
» Provide a sealed junction with good flow areas capable of carrying high loads

SOLUTION
» A 10 3/4-in. FlexRite® isolated tieback multilateral system with lateral access, a high-pressure junction, and large flow capacity

RESULTS
» FlexRite system provided Statoil with capability for high-pressure water injection into two different reservoirs from one multilateral well
» Success of FlexRite system enabled Statoil to reduce its subsea investment and obtain higher initial and accumulated production

CHALLENGES
Statoil’s Fram East field in the Norwegian sector of the North Sea is a subsea satellite 20 kilometers (12.5 miles) north of the Troll C platform, with a water depth of 360 meters (1,181 feet). Statoil required high-pressure water injection into two different reservoirs, but had only one slot left on the template. This scenario required a multilateral well for water injection into the upper and lower reservoirs in the Fram East structure to pressure two different production wells.

As the first water injector on the Fram East development, the multilateral well would have the main bore in the Lower Sognefjord sandstones and the lateral branch in the Draupne and Upper Sognefjord sandstones. The well would be completed with sand screens in the injection intervals, and would have individual branch control. Statoil needed a TAML Level 5 multilateral junction that would be able to accommodate high injection pressure and possible large pressure differences between the two lateral branches. Additional requirements included a sealed junction with a short installation time and with good flow areas capable of carrying high loads.
SOLUTION

Halliburton designed a 10 3/4-inch FlexRite® isolated tieback multilateral system with lateral access, a high-pressure junction, and a large flow capacity. This FlexRite Lateral Access (LA) system had the safe working pressure of 4,467 psi (308 bar).

The main component in the FlexRite LA system is a flexible junction that connects the main bore and lateral branches, providing hydraulic and mechanical isolation. This multilateral system has a large flow capacity and maintains hydraulic pressure integrity at the junction. It is designed for a maximum injection rate of 6,000 cubic meters/day.

RESULTS

The successful installation of the 10 3/4-inch FlexRite LA system provided Statoil with the capability for high-pressure water injection into two different reservoirs from one multilateral well.

Through this innovative multilateral technology, Statoil has been able to reduce its subsea investment (due to fewer templates and pipelines), cut drilling costs, increase reservoir drainage, delay gas and water breakthrough, and obtain higher initial and accumulated production.