Isolate Formation in High-Pressure, High-Temperature Wells

Case study: FIV valve protects formation, resulting in lower skin and higher production

**Challenge**
Protect a formation from drilling mud damage after well testing and before installation of the upper completion.

**Solution**
Install FIV* Formation Isolation Valve as bidirectional barrier and open it without intervention to isolate the reservoir and prevent kill-weight fluid from contacting the formation.

**Results**
Protected the formation from further exposure to flowback.

**Drilling mud poses damage risk**
An operator planned to drill several gas wells in water depths of up to 520 m [1,706 ft] and pressures of up to 10,000 psi [68,947.6 kPa]. The pressure of the first well was 10,000 psi and its temperature was 157 degC [315 degF]. The well was to be drilled to 6,000 m [19,684 ft] with a 1,000-m [3,281 ft] openhole section and an inclination of up to 90°. After the well test (and before installing the upper completion), the operator needed an efficient, reliable method to prevent the 35% solid kill-weight fluid from damaging the formation.

**FIV valve provides bidirectional barrier**
The operator selected the Schlumberger FIV Formation Isolation Valve because of its established track record. The FIV valve is a bidirectional sealing ball-type valve that has a higher differential rating than does a flapper-type fluid-loss device. In addition, the valve’s Trip Saver* one-time remote-opening feature enables the valve to be opened with tubing pressure from the surface, eliminating an intervention trip into the well. When the Trip Saver indexing mechanism reaches the opening cycle, the mechanism actuates on the bleedoff of the last cycle, opening the valve.

The FIV valve was installed (in the open position) above the stand-alone screens in the cased section of the wellbore. The operator flowed the well to measure the flow rate and remove all the drilling mud. Upon completion of the well test, the FIV valve was closed to isolate the formation and allow safe retrieval of the testing string.

Isolation valves are suited for a variety of applications and environments, including subsea completions.
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Because of the barrier provided by the FIV valve, there was minimum formation damage from the mud, resulting in a low skin and enhanced production. Close collaboration between the operator and Schlumberger allowed the operator to achieve its operational and safety objectives without incident. To date, the operator has installed more than 30 FIV valves in both oil and gas wells.