

FORTRESS-HP Isolation Valves Perform Flawlessly in Deepwater High-Pressure Wells, Gulf of Mexico

Application-specific design and unmatched opening force address potential debris issues due to unconsolidated sands and multiweek well suspension periods

CHALLENGE

Ensure reliable isolation valve operation in deepwater HPHT wells drilled through unconsolidated sands in the Gulf of Mexico.

SOLUTION

Deploy the new FORTRESS-HP* high-pressure spring-triggered premium isolation valves.

RESULTS

The valves worked flawlessly despite depths exceeding 20,000 ft [6,095 m] and suspension periods of several weeks.



Deepwater wells challenge isolation valve operation

Deepwater wells in the Gulf of Mexico present challenging conditions for downhole formation isolation valves. Failure of the valves can lead to milling runs, remedial perforations to bypass a stuck valve, or even well abandonment. An operator drilling through an HPHT sand formation in more than 7,000 ft [2,135 m] of water required a reliable, debris-resistant valve for the hostile conditions. When a deepwater well is suspended for some time before being placed on production, considerable debris can settle out, especially in wells drilled through thick layers of unconsolidated sand.

New interventionless barrier valve provides unmatched reliability

Schlumberger proposed using its new FORTRESS-HP high-pressure spring-triggered premium isolation valve. Designed to withstand reservoir pressures up to 18,000 psi [124 MPa] and temperatures up to 375 degF [191 degC], the valve has been qualified to bubble-tight conditions and meets or exceeds API 19V/ISO 28781 V1 and Q1 barrier standards.

The Trip Saver* one-time remote-opening mechanism provides one interventionless opening of the FORTRESS-HP valve, using a predetermined number of tubing pressure cycles applied against the closed valve. When the final cycle is reached, a trigger mechanism provides an opening force that far exceeds the force available with any other isolation valve currently on the market. Special design features further improve debris tolerance and the trigger internals operate in clean hydraulic fluid, providing unsurpassed reliability in challenging well conditions. Before the remote-opening mechanism is actuated, the valve can be opened and closed multiple times by mechanical means.

Operator suspends wells for several weeks before smoothly placing them on production

The valve was run in oil-based mud and installed at a depth greater than 20,000 ft. Bottomhole pressure and temperature were more than 15,000 psi [103 MPa] and 300 degF [149 degC]. The mud was displaced with brine; the cased well was completed with stand-alone screens and subsequently suspended. After several weeks, the FORTRESS-HP valve opened uneventfully and the well was placed on production. This performance was repeated in another well with similar conditions, and additional wells are planned.



The robust, dependable FORTRESS-HP valve provided a solution to the operator's challenging well conditions.