

New Technology Enables Operator to Achieve A Level of Efficiency Previously Unachievable

TURBO TECH® II VALVE AND INFLOW TECH® PACKER WITH SETTING CONTROL MODULE ENABLE WELLBORE CLEANOUT IN A SINGLE-TRIP

NORTH SEA, NORWAY

CHALLENGE

Reliably operate two compression-set tools in a string at the same time.

- » Prevent offsetting efficiency gains with tool failures
- » Avoiding limited string movement that reduces efficiency

SOLUTION

Turbo Tech II valve and Inflow Tech packer with Setting Control Module

- » Resettable shearing feature so each tool can be reset to original resistance
- » Valve maintains annulus and tubing pressure integrity in the compressed/intermediate position
- » Valve stays open when returned to tension and does not need to be held in the open position with compression

RESULTS

The negative test on the 5 ½-in. liner was successfully completed to approximately 2200 PSI.

- » Turbo Tech II valve functioned five times
- » End of job pressure test proved that the valve held the same pressure it tested to prior to load out

OVERVIEW

A major operator in the Norwegian sector of the North Sea planned a single-trip to complete an inflow test and displacement / wellbore cleanup on a high profile well. As the well utilized small diameter liners, it was determined that a circulation boost / bypass valve was necessary to provide sufficient annular velocities to hydraulically lift debris up and out of the wellbore. By choosing to complete all planned operations in a single trip, the operator required a string design that would give them the flexibility to perform a negative test and then allow for a clean-up with flow rates up to 30 BPM and displacement to seawater utilizing both reverse and conventional circulation.

Successfully completed negative test and captured 77 lbs (35kg) of debris from well during displacement run

CHALLENGE

A major industry challenge that operators face is being able to reliably operate two compression-set tools in the string at the same time. Since most wellbore cleanout-compatible (rotatable) packers are compression-set, operators typically must compromise with a ball-drop bypass tool or risk an unintentional functioning of one of the compression-set tools, which could lead to a failed run.

Industry run history has shown that the long-term reliability of running two compression-set tools in the string at the same time is poor, and typically offsets any efficiency gains that the run is intended to achieve. Many compression-set bypass tools available must stay in compression to remain open, which limits string movement and reduces the efficiency of the cleanout run.

SOLUTION

The Turbo Tech® II valve and Inflow Tech® High-Performance packer with Setting Control Module (SCM) were designed to address this specific challenge with three major design features. First, both tools do not rely on single shearing functions, such as pins, and both can be reset to their original compression resistance each time they are returned to tension.

Second, the Turbo Tech II valve was designed to maintain annulus and tubing pressure integrity in the compressed/intermediate position. This avoids creating a leak path and allows the negative test operation to continue in the event the Turbo Tech II valve unintentionally functions during the setting and operation of the Inflow Tech packer SCM. Finally, since the Turbo Tech II valve stays open when returned to tension and does not need to be held in the open position with compression, the string can be reciprocated to assist in the cleanout of the 5 1/2-in. liner.

RESULTS

The negative test on the 5 1/2-in. liner was successfully completed to approximately 2200 psi. Two wash pills were circulated in the well – one reverse circulated and one conventionally circulated and boosted to surface at a high rate by the Turbo Tech II valve. The Turbo Tech II valve functioned a total of five times. The tool was successfully pressure tested to 8,000 PSI after the job, maintaining the same pressure integrity from shop build to the end of the job.

This job would be unable to be completed in a single run without the tools provided.



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