CASE STUDY

Flow Activated Shifting Tool bottom hole assembly for Isolation Valve manipulation.

PROJECT

The completions group of major service company approached DTI to provide a Coiled Tubing BHA to enable through tubing Isolation Valve stimulation of wells in Saudi Arabia. The wells featured a lower completion Isolation Valve with 2.94” ID and an upper completion minimum restriction of 2.813”. A robust coiled tubing shifting and circulating BHA was required to pass through the upper completion, activate the Shifting Tool to open the Isolation Valve, bypass the Shifting Tool while pumping the stimulation fluids, and then reactivate the Shifting Tool to close the Isolation Valve.

RESULTS

A customized version of DTI’s High Expansion Hydraulic Shifting Tool was proposed to securely engage the shifting collet style profile within the Isolation Valve. DTI had previously supplied flow activated shifting tools with key profiles to suit their Formation Isolation Valves so since similar Shifting Tools had previously been used, gaining approval to run the modified Shifting Tool was prompt.

To pump the stimulation through the BHA while bypassing the reduced ID of the Hydraulic Shifting Tool required a switchable Circulation Valve. Operating company concerns with indexing type Circulation Valves made a drop ball type valve the preferred option for this application. A Three-Way Circulation Valve was designed, manufactured, and tested specifically for this application.

The Three-Way Circulation Valve allows circulation only to the Shifting Tool initially. The Shifting Tool was hydraulically activated, and the Isolation Valve engaged to shift it open. After passing through the Isolation Valve with the CT, a ball was dropped and 2500PSI applied to open a circulation path to the well whilst plugging the flow path to the Shifting Tool below. After pumping the stimulation, a second ball was dropped and 3800PSI applied to return the flow path to the Shifting Tool only. The Shifting Tool was then hydraulically activated, and the Isolation Valve engaged to shift it closed.

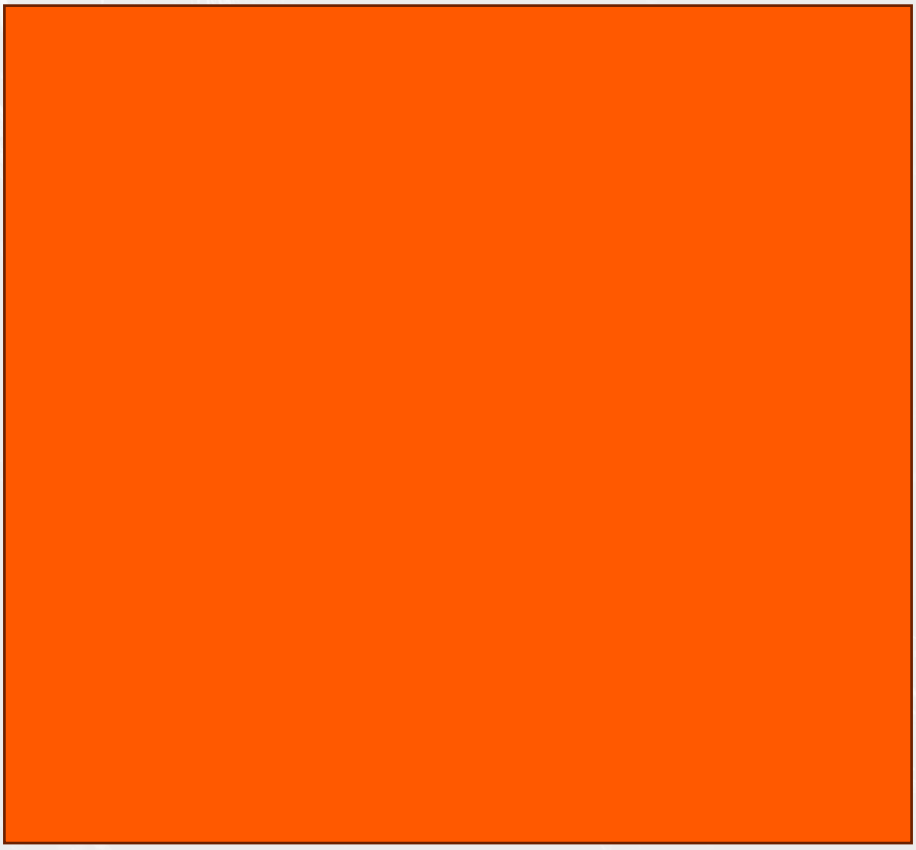
The Service Company and National Operating Company were very happy with the performance of the BHA, and the successful intervention progressed discussions on completing more wells with similar Isolation Valves.

FEATURES & BENEFITS

DTI engineered solutions covering slickline and coiled tubing well intervention applications have supported our client's operational success for many years. Our intervention expertise and dedicated engineering, manufacturing and test capabilities enable us to deliver solutions rapidly. In addition, our extensive client support when running engineered solutions ensures successful operations.

This is an example of a bespoke solution to suit a unique set of circumstances. The solution derives from DTI's extensive knowledge of downhole manipulation tools and catalogue of field proven tools.

DTI was able to work closely with the customer to provide a combination of tools that met the clients' requirements, advise on the BHA tool string and support the service company on the on the operational procedures.



KEY FIGURES & STATS

- Taylor made design of shifting tool and circulation valve.
- Flow activated high expansion shifting tools with keys to suit the 2.94" ID FIV
- Three-way circulation valve designed to suit the required operation procedure.
- Activation pressures designed to suit the operation and enable high flow circulation with the drop of a ball.